

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH07	7.75	C	14	7.75	1	Thinly laminated grey SILTSTONE.	A+P+X	105.94	97.21	89.13	2.83	109.65	0.24	1.42	0.34
BH07	7.75	C	14	7.75	2	Thinly laminated grey SILTSTONE.	A+P+X	105.94	78.81	71.24	3.29	98.03	0.34	1.35	0.46

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH07	7.85	C	15	7.85	1	Thinly laminated grey SILTSTONE.	D+L+X	106.08	104.85	101.91	0.85	103.37	0.08	1.39	0.11
BH07	7.85	C	15	7.85	2	Thinly laminated grey SILTSTONE.	A+P+X	105.41	55.92	52.18	2.83	83.69	0.4	1.26	0.51

Key		Point Load Type		D Diametral		A Axial	
(Combination of)		I Irregular lump		B Block		P Perpendicular to planes of weakness	
Dimensions		L Parallel to planes of weakness		X Invalid failure of point load (not broken between points of load application)			
		W Distance between contact points and nearest free end (not applicable to axial tests)		L Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump			
		D Distance between platens when just in contact with specimen		D' Distance between platens at point of failure			
		De Equivalent core diameter		Is P/De2			
		Is(50) F x Is		F (De/50)0.45			
		Is(50) point load strength index corrected for a diametral test of core diameter 50mm					
		For Axial/Lump tests De2 = (4/Pi) x (W x D')		For Diametral tests De2 = D x D'			

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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH07	9.23	C	17	9.23	1	Thinly interlaminated grey SILTSTONE and SANDSTONE. Tested outside calibrated range of device	D+L	105.37	104.5	102.95	0.33	103.72	0.03	1.39	0.04
BH07	9.23	C	17	9.23	2	Thinly interlaminated grey SILTSTONE and SANDSTONE.	A+P	105.52	63.9	51.73	4.47	83.37	0.64	1.26	0.81
Key															
Point Load	Type	D	Diametral				A	Axial							
(Combination of)		I	Irregular lump				B	Block							
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		X	Invalid failure of point load (not broken between points of load application)												
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)												
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump												
		D	Distance between platens when just in contact with specimen												
		D'	Distance between platens at point of failure												
		De	Equivalent core diameter				Is	P/De2							
		Is(50)	F x Is				F	(De/50)0.45							
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm												
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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH07	9.00	C	16	9.00	1	Thinly laminated grey SILTSTONE.	D+L	105.35	104.63	101.55	1.15	103.08	0.11	1.38	0.15
BH07	9.00	C	16	9.00	2	Thinly laminated grey SILTSTONE.	A+P+X	105.38	66.68	62.24	3.44	91.38	0.41	1.31	0.54

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

$(4/\pi) \times (W \times D')$

A

B

P

Is

F

For Diametral tests

Axial

Block

Perpendicular to planes of weakness

$P/De2$

$(De/50)0.45$

$De2 = D \times D'$

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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	11.80	C	31	11.80	1	Thinly laminated dark grey MUDSTONE.	A+X	106.48	45.06	39.66	0.52	73.33	0.1	1.19	0.11
BH08	11.80	C	31	11.80	2	Thinly laminated dark grey MUDSTONE.	A	106.48	37.01	25.6	1.29	58.91	0.37	1.08	0.4
Key															
Point Load	Type	D	Diametral				A	Axial							
(Combination of)		I	Irregular lump				B	Block							
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness							
		X	Invalid failure of point load (not broken between points of load application)												
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)												
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		D	Distance between platens when just in contact with specimen												
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		De	Equivalent core diameter				Is	P/De2							
		Is(50)	F x Is				F	(De/50)0.45							
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm												
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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	13.82	C	33	13.82	1	Thinly laminated grey SANDSTONE. Tested outside calibrated range of device	D+L+X	106.34	106.55	103.21	0.43	104.87	0.04	1.4	0.05
BH08	13.82	C	33	13.82	2	Thinly laminated grey SANDSTONE.	A+P	106.48	63.41	49.96	3.43	82.30	0.51	1.25	0.63

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Point Load Type

(Combination of)

Dimensions

D Diametral

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De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

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F (De/50)0.45

For Diametral tests $De2 = D \times D'$

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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	16.75	C	35	16.75	1	Thinly laminated grey SANDSTONE.	A+P+X	106.55	71.53	59.18	3.44	89.60	0.43	1.3	0.56
BH08	16.75	C	35	16.75	2	Thinly laminated grey SANDSTONE.	A+P	106.37	46.77	36.78	3.41	70.58	0.68	1.17	0.8

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

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Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

P/De2

(De/50)0.45

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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	17.60	C	36	17.60	1	Thinly laminated grey SANDSTONE.	D+L	106.23	106.58	103.85	1.73	105.21	0.16	1.4	0.22
BH08	17.60	C	36	17.60	2	Thinly laminated grey SANDSTONE.	A+P+X	106.5	76.89	63.62	6.76	92.88	0.78	1.32	1.04

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

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Equivalent core diameter

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A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

For Diametral tests $De2 = D \times D'$

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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	22.40	C	39	22.40	1	Thinly laminated grey SANDSTONE.	D+L+X	106.39	106.6	102.11	4.2	104.33	0.39	1.39	0.54
BH08	22.40	C	39	22.40	2	Thinly laminated grey SANDSTONE.	A+P	106.3	65.47	55.62	9.34	86.76	1.24	1.28	1.59

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

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Equivalent core diameter

F x Is

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A

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(De/50)0.45

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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	23.10	C	40	23.10	1	Grey SANDSTONE.	I	90.29	61.36	58.1	3.11	81.73	0.47	1.25	0.58
BH08	23.10	C	40	23.10	2	Grey SANDSTONE.	I	60.49	50.56	47.85	3.04	60.71	0.82	1.09	0.9
Key															
Point Load Type		D		Diametral		A		Axial							
(Combination of)		I		Irregular lump		B		Block							
		L		Parallel to planes of weakness		P		Perpendicular to planes of weakness							
Dimensions		X		Invalid failure of point load (not broken between points of load application)											
		L		Distance between contact points and nearest free end (not applicable to axial tests)											
		W		Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump											
		D		Distance between platens when just in contact with specimen											
		D'		Distance between platens at point of failure											
		De		Equivalent core diameter		Is		P/De2							
		Is(50)		F x Is		F		(De/50)0.45							
		Is(50)		point load strength index corrected for a diametral test of core diameter 50mm											
				For Axial/Lump tests De2 = (4/Pi) x (W x D')				For Diametral tests De2 = D x D'							
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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result									
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2	
BH08	24.05	C	41	24.05	1	Grey SANDSTONE.	A	105.65	57.44	52.19	7.95	83.79	1.13	1.26	1.43	
BH08	24.05	C	41	24.05	2	Grey SANDSTONE.	D	106.77	106.99	98.39	10.84	102.60	1.03	1.38	1.42	
Key																
Point Load	Type	D	Diametral				A	Axial								
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		De	Equivalent core diameter				Is	P/De2								
		Is(50)	F x Is				F	(De/50)0.45								
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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2		
BH08	26.65	C	42	26.65	1	Grey SANDSTONE.	D	106.67	106.83	100.92	12.2	103.83	1.13	1.39	1.57		
BH08	26.65	C	42	26.65	2	Grey SANDSTONE.	A	106.73	55.66	49.68	9.01	82.17	1.33	1.25	1.67		
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Point Load Type	D	Diametral				A	Axial										
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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH08	27.60	C	43	27.60	1	Grey SANDSTONE.	D	106.83	106.87	101.18	8.54	103.99	0.79	1.39	1.1
BH08	27.60	C	43	27.60	2	Grey SANDSTONE.	A	106.95	96.9	85.19	12.76	107.71	1.1	1.41	1.55

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

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point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

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P/De2

(De/50)0.45

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Block

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							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2		
BH09	10.85	C	38	10.85	1	Thinly laminated dark grey MUDSTONE. Tested outside calibrated range of device	I+P+X	45.26	33.44	30.51	0.24	41.93	0.14	0.92	0.13		
BH09	10.85	C	38	10.85	2	Thinly laminated dark grey MUDSTONE. Tested outside calibrated range of device	I+P+X	80.86	47.57	45.18	0.14	68.20	0.03	1.15	0.03		
Key																	
Point Load Type		D	Diametral				A	Axial									
(Combination of)		I	Irregular lump				B	Block									
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		X	Invalid failure of point load (not broken between points of load application)														
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)														
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump														
		D	Distance between platens when just in contact with specimen														
		D'	Distance between platens at point of failure														
		De	Equivalent core diameter														
		Is(50)	F x Is				Is	P/De2									
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm				F	(De/50)0.45									
		For Axial/Lump tests De2 = (4/Pi) x (W x D')															
		For Diametral tests De2 = D x D'															
Approved by:						Results apply to samples as received.											
Steve Harper						Print date 31/10/2024											
Revision No. 3.00						Issue Date 07/12/2023											

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH09	12.35	C	39	12.35	1	Thinly laminated brownish grey MUDSTONE. Tested outside calibrated range of device	A+P+X	105.97	52.04	47.99	0.18	80.47	0.03	1.24	0.03
BH09	12.35	C	39	12.35	2	Thinly laminated brownish grey MUDSTONE.	A+P	106.16	55.9	47.14	1.68	79.82	0.26	1.23	0.33

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result											
Project No. LT1983																	
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method											
Client Structural Soils Ltd																	
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result										
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2		
BH09	14.40	C	41	14.40	1	Thinly laminated grey SANDSTONE.	D+L	105.9	104.51	101.32	2.46	102.90	0.23	1.38	0.32		
BH09	14.40	C	41	14.40	2	Thinly laminated grey SANDSTONE.	A+P	105.91	59.2	48.84	8.17	81.15	1.24	1.24	1.54		
Key																	
Point Load	Type	D	Diametral				A	Axial									
(Combination of)		I	Irregular lump				B	Block									
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness									
		X	Invalid failure of point load (not broken between points of load application)														
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)														
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump														
		D	Distance between platens when just in contact with specimen														
		D'	Distance between platens at point of failure														
		De	Equivalent core diameter				Is	P/De2									
		Is(50)	F x Is				F	(De/50)0.45									
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm														
			For Axial/Lump tests De2 = (4/Pi) x (W x D')						For Diametral tests De2 = D x D'								
Approved by:							Results apply to samples as received.										
Steve Harper							Print date 31/10/2024										
			Revision No.		3.00		Issue Date		07/12/2023								

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH09	16.80	C	43	16.80	1	Thinly laminated grey SANDSTONE. Tested outside calibrated range of device	D+L+X	105.3	104.81	102.94	0.06	103.87	0.01	1.39	0.01
BH09	16.80	C	43	16.80	2	Thinly laminated grey SANDSTONE.	A+P+X	106.15	75.39	68.4	3.82	96.15	0.41	1.34	0.55

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH09	17.50	C	44	17.50	1	Thinly laminated grey SANDSTONE.	D+L	105.86	104.65	102.06	2.74	103.35	0.26	1.39	0.36
BH09	17.50	C	44	17.50	2	Thinly laminated grey SANDSTONE.	A+P	106.03	75.76	64.75	9.28	93.50	1.06	1.33	1.41

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Diametral tests $De2 = D \times D'$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH09	19.50	C	45	19.50	1	Thinly laminated grey SANDSTONE.	I+L	105.58	71.74	68.65	1.99	96.07	0.22	1.34	0.29
BH09	19.50	C	45	19.50	2	Thinly laminated grey SANDSTONE.	I+P	77.96	44.47	41.11	2.4	63.88	0.59	1.12	0.66

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Diametral tests $De2 = D \times D'$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH10	10.90	C	37	10.90	1	Thinly laminated grey and brown SANDSTONE.	A+P+X	106.5	88.77	84.26	1.49	106.89	0.13	1.41	0.18
BH10	10.90	C	37	10.90	2	Thinly laminated grey and brown SANDSTONE.	I+P	84	44.96	40.65	0.58	65.94	0.13	1.13	0.15

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH10	12.45	C	38	12.45	1	Thinly laminated grey SANDSTONE with brown staining. Tested outside calibrated range of device	A+P+X	106.82	77.85	73.33	0.21	99.87	0.02	1.37	0.03
BH10	12.45	C	38	12.45	2	Thinly laminated grey SANDSTONE with brown staining. Tested outside calibrated range of device	A+P+X	106.8	54.76	50.28	0.41	82.69	0.06	1.25	0.08

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name						A635 Barnsley Bus Rapid Transit Route						Point Load Index Result											
Project No.						LT1983																	
Engineer						Structural Soils Ltd																	
Client						Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method											
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result																
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2								
BH10	14.75	C	39	14.75	1	Thinly laminated grey SILTSTONE. Tested outside calibrated range of device	A+P+X	106.7	54.56	50.14	0.26	82.53	0.04	1.25	0.05								
BH10	14.75	C	39	14.75	2	Thinly laminated grey SILTSTONE. Tested outside calibrated range of device	A+P+X	106.81	67.74	62.73	0.14	92.36	0.02	1.32	0.02								
Key																							
Point Load Type		D		Diametral		A		Axial															
(Combination of)		I		Irregular lump		B		Block															
		L		Parallel to planes of weakness		P		Perpendicular to planes of weakness															
Dimensions		X		Invalid failure of point load (not broken between points of load application)																			
		L		Distance between contact points and nearest free end (not applicable to axial tests)																			
		W		Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump																			
		D		Distance between platens when just in contact with specimen																			
		D'		Distance between platens at point of failure																			
		De		Equivalent core diameter		Is		P/De2															
		Is(50)		F x Is		F		(De/50)0.45															
		Is(50)		point load strength index corrected for a diametral test of core diameter 50mm																			
				For Axial/Lump tests De2 = (4/Pi) x (W x D')				For Diametral tests De2 = D x D'															
Approved by:								Results apply to samples as received.															
Steve Harper								Print date 31/10/2024															
Revision No.				3.00				Issue Date				07/12/2023											

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result													
Project No. LT1983																			
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method													
Client Structural Soils Ltd																			
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result												
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2				
BH10	18.00	C	42	18.00	1	Fractured thinly laminated grey SANDSTONE.	I+P	75.79	40.02	36.64	0.87	59.46	0.25	1.08	0.27				
BH10	18.00	C	42	18.00	2	Fractured thinly laminated grey SANDSTONE.	I+P	90.06	58.19	48.97	4.51	74.94	0.8	1.2	0.96				
Key																			
Point Load Type		D	Diametral				A	Axial											
(Combination of)		I	Irregular lump				B	Block											
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness											
Dimensions		X	Invalid failure of point load (not broken between points of load application)																
		L	Distance between contact points and nearest free end (not applicable to axial tests)																
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump																
		D	Distance between platens when just in contact with specimen																
		D'	Distance between platens at point of failure																
		De	Equivalent core diameter																
		Is(50)	F x Is				Is	P/De2											
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm				F	(De/50)0.45											
		For Axial/Lump tests De2 = (4/Pi) x (W x D')																	
		For Diametral tests De2 = D x D'																	
Approved by:							Results apply to samples as received.									 soil engineering			
Steve Harper							Print date 31/10/2024												
Revision No.			3.00			Issue Date			07/12/2023										

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH10	19.50	C	43	19.50	1	Thinly laminated grey SANDSTONE.	D+L	106.39	106.67	103.4	3.23	105.02	0.29	1.4	0.41
BH10	19.50	C	43	19.50	2	Thinly laminated grey SANDSTONE.	A+P	106.36	63.41	57.56	9.43	88.29	1.21	1.29	1.56

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

P/De2

(De/50)0.45

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH10	21.55	C	44	21.55	1	Thinly laminated grey mottled brown SANDSTONE.	D+L	106.51	106.2	102.53	4.8	104.35	0.44	1.39	0.61
BH10	21.55	C	44	21.55	2	Thinly laminated grey mottled brown SANDSTONE.	A+P	106.35	54.79	50.75	5.99	82.90	0.87	1.26	1.09

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH10	24.70	C	46	24.70	1	Thinly laminated grey mottled brown SANDSTONE.	D+L+X	106.11	106.3	103	1.96	104.64	0.18	1.39	0.25
BH10	24.70	C	46	24.70	2	Thinly laminated grey mottled brown SANDSTONE.	A+P	106.06	83.4	69.98	10.07	97.21	1.07	1.35	1.44
Key															
Point Load	Type	D	Diametral				A	Axial							
(Combination of)		I	Irregular lump				B	Block							
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness							
		X	Invalid failure of point load (not broken between points of load application)												
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)												
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump												
		D	Distance between platens when just in contact with specimen												
		D'	Distance between platens at point of failure												
		De	Equivalent core diameter				Is	P/De2							
		Is(50)	F x Is				F	(De/50)0.45							
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm												
			For Axial/Lump tests De2 = (4/Pi) x (W x D')						For Diametral tests De2 = D x D'						
Approved by:							Results apply to samples as received.								
Steve Harper							Print date 31/10/2024								
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	15.31	C	44	15.31	1	Thinly laminated grey SANDSTONE.	D+L	106.8	105.61	101.18	5.05	103.37	0.47	1.39	0.66
BH11	15.31	C	44	15.31	2	Thinly laminated grey SANDSTONE.	A+P+X	106.57	65.72	49.13	10.99	81.65	1.65	1.25	2.06

Key

Point Load Type

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

Dimensions

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	15.62	C	45	15.62	1	Thinly laminated grey SANDSTONE.	D+X	106.49	105.57	100.71	3.34	103.11	0.31	1.39	0.44
BH11	15.62	C	45	15.62	2	Thinly laminated grey SANDSTONE.	A	106.39	78.08	65.9	9.11	94.48	1.02	1.33	1.36

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	17.72	C	42	17.72	1	Thinly laminated grey SANDSTONE.	D+L	106.83	106.64	103.39	4.59	105.00	0.42	1.4	0.58
BH11	17.72	C	42	17.72	2	Thinly laminated grey SANDSTONE.	A+P	106.58	82.65	69.95	10.07	97.43	1.06	1.35	1.43
Key															
Point Load	Type	D	Diametral				A	Axial							
(Combination of)		I	Irregular lump				B	Block							
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness							
		X	Invalid failure of point load (not broken between points of load application)												
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)												
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump												
		D	Distance between platens when just in contact with specimen												
		D'	Distance between platens at point of failure												
		De	Equivalent core diameter				Is	P/De2							
		Is(50)	F x Is				F	(De/50)0.45							
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm												
			For Axial/Lump tests De2 = (4/Pi) x (W x D')						For Diametral tests De2 = D x D'						
Approved by:						Results apply to samples as received.									
Steve Harper						Print date 31/10/2024									
Revision No.		3.00				Issue Date		07/12/2023							
															

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result												
Project No. LT1983																		
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method												
Client Structural Soils Ltd																		
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result											
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2			
BH11	18.60	C	47	18.60	1	Thinly laminated grey SANDSTONE.	D+L	106.12	105.01	99.26	10.76	102.09	1.03	1.38	1.42			
BH11	18.60	C	47	18.60	2	Thinly laminated grey SANDSTONE.	A+P	106.29	66.53	57.05	10.6	87.87	1.37	1.29	1.77			
Key																		
Point Load	Type	D	Diametral				A	Axial										
(Combination of)		I	Irregular lump				B	Block										
		L	Parallel to planes of weakness				P	Perpendicular to planes of weakness										
		X	Invalid failure of point load (not broken between points of load application)															
Dimensions		L	Distance between contact points and nearest free end (not applicable to axial tests)															
		W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump															
		D	Distance between platens when just in contact with specimen															
		D'	Distance between platens at point of failure															
		De	Equivalent core diameter				Is	P/De2										
		Is(50)	F x Is				F	(De/50)0.45										
		Is(50)	point load strength index corrected for a diametral test of core diameter 50mm															
			For Axial/Lump tests De2 = (4/Pi) x (W x D')						For Diametral tests De2 = D x D'									
Approved by:							Results apply to samples as received.											
Steve Harper							Print date 31/10/2024											
Revision No.			3.00		Issue Date		07/12/2023											

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	19.68	C	48	19.68	1	Thinly laminated light brown SANDSTONE.	D+L	106.6	105.74	101.61	7.07	103.65	0.66	1.39	0.91
BH11	19.68	C	48	19.68	2	Thinly laminated light brown SANDSTONE.	A+P	106.61	67.06	58.82	7.54	89.35	0.94	1.3	1.23
Key															
Point Load Type		D		Diametral		A		Axial							
(Combination of)		I		Irregular lump		B		Block							
		L		Parallel to planes of weakness		P		Perpendicular to planes of weakness							
Dimensions		X		Invalid failure of point load (not broken between points of load application)											
		L		Distance between contact points and nearest free end (not applicable to axial tests)											
		W		Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump											
		D		Distance between platens when just in contact with specimen											
		D'		Distance between platens at point of failure											
		De		Equivalent core diameter		Is		P/De2							
		Is(50)		F x Is		F		(De/50)0.45							
		Is(50)		point load strength index corrected for a diametral test of core diameter 50mm											
				For Axial/Lump tests De2 = (4/Pi) x (W x D')				For Diametral tests De2 = D x D'							
Approved by:								Results apply to samples as received.							
Steve Harper								Print date 31/10/2024							
Revision No. 3.00				Issue Date 07/12/2023				soil engineering							

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	21.48	C	50	21.48	1	Thinly laminated grey mottled brown SANDSTONE.	D+L	106.17	104.82	101.92	1.77	103.36	0.17	1.39	0.23
BH11	21.48	C	50	21.48	2	Thinly laminated grey mottled brown SANDSTONE.	A+P	106.27	63.65	57.02	8.29	87.84	1.07	1.29	1.38

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH11	27.43	C	54	27.43	1	Thinly laminated grey SANDSTONE.	D+L	106.6	106.09	100.32	6.91	103.16	0.65	1.39	0.9
BH11	27.43	C	54	27.43	2	Thinly laminated grey SANDSTONE.	A+P+X	106.46	83.85	77.47	5.82	102.47	0.55	1.38	0.77

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	3.70	C	6	3.70	1	Thinly interlaminated grey SANDSTONE and MUDSTONE.	A+P+X	105.88	87.5	69.36	7.65	96.70	0.82	1.35	1.1
BH12	3.70	C	6	3.70	2	Thinly interlaminated grey SANDSTONE and MUDSTONE.	A+P	106.05	66.33	52.77	7.15	84.41	1	1.27	1.27

Key

Point Load Type

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

Dimensions

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	5.10	C	7	5.10	1	Thinly laminated grey SANDSTONE.	D+L	105.59	105.51	104.14	1.29	104.82	0.12	1.4	0.16
BH12	5.10	C	7	5.10	2	Thinly laminated grey SANDSTONE.	A+P+X	105.29	59.56	48.32	5.04	80.48	0.78	1.24	0.96

Key

Point Load Type

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

Dimensions

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	5.65	C	8	5.65	1	Thinly laminated grey SANDSTONE.	A+P+X	105.74	75.25	51.99	4.89	83.66	0.7	1.26	0.88
BH12	5.65	C	8	5.65	2	Thinly laminated grey SANDSTONE.	A+P+X	105.84	60.64	56.88	2.45	87.55	0.32	1.29	0.41

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	6.90	C	9	6.90	1	Thinly laminated grey SANDSTONE.	I+P+X	90.99	65.38	59.1	1.32	82.75	0.19	1.25	0.24
BH12	6.90	C	9	6.90	2	Thinly laminated grey SANDSTONE.	I+P	78.51	30.08	26.23	2.31	51.21	0.88	1.01	0.89

Key

Point Load Type

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

Dimensions

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
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Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	8.30	C	10	8.30	1	Thinly laminated grey SANDSTONE.	D+L	105.78	106.02	103.74	3.14	104.87	0.29	1.4	0.4
BH12	8.30	C	10	8.30	2	Thinly laminated grey SANDSTONE.	A+P+X	106.12	72.15	58.29	7.06	88.75	0.9	1.29	1.16

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests De2 = (4/Pi) x (W x D')

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests De2 = D x D'

Axial

Block

Perpendicular to planes of weakness

P/De2

(De/50)0.45

Approved by:		Results apply to samples as received.		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH12	9.70	C	11	9.70	1	Thinly laminated grey SANDSTONE.	D+L+X	106.04	105.67	104.12	3.28	104.89	0.3	1.4	0.42
BH12	9.70	C	11	9.70	2	Thinly laminated grey SANDSTONE.	A+P+X	105.98	74.73	64.58	6.15	93.35	0.71	1.32	0.93

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH13	3.45	C	8	3.45	1	Thinly laminated grey SANDSTONE.	D+L	105.48	106.28	103.5	8.29	104.88	0.75	1.4	1.05
BH13	3.45	C	8	3.45	2	Thinly laminated grey SANDSTONE.	A+P	105.08	82.59	70.5	9.42	97.12	1	1.35	1.35

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH13	4.70	C	10	4.70	1	Thinly laminated brownish grey SANDSTONE. Tested outside calibrated range of device	D+L	104.99	105.71	103.79	0.03	104.75	0	1.39	0
BH13	4.70	C	10	4.70	2	Thinly laminated brownish grey SANDSTONE.	A+P	105.31	66.01	59.03	10.38	88.97	1.31	1.3	1.7

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

P/De2

(De/50)0.45

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Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH13	8.00	C	12	8.00	1	Thinly laminated grey SANDSTONE.	D+L	104.6	104.77	102.06	5.75	103.41	0.54	1.39	0.75
BH13	8.00	C	12	8.00	2	Thinly laminated grey SANDSTONE.	A+P	105.97	63.53	60.62	7.17	90.44	0.88	1.31	1.14

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH13	9.50	C	14	9.50	1	Thinly laminated grey SANDSTONE.	D+L	104.11	104.29	99.55	5.5	101.89	0.53	1.38	0.73
BH13	9.50	C	14	9.50	2	Thinly laminated grey SANDSTONE.	A+P	102.79	65.71	59.91	8.61	88.55	1.1	1.29	1.42

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH14	4.05	C	7	4.05	1	Fractured thinly laminated grey and brown SILTSTONE. Tested outside calibrated range of device	A	105.95	44.91	38.86	0.19	72.40	0.04	1.18	0.04
BH14	4.05	C	7	4.05	2	Fractured thinly laminated grey and brown SILTSTONE. Tested outside calibrated range of device	A	105.59	56.08	54.17	0.03	85.34	0	1.27	0.01

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		 SOIL engineering
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Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH14	4.73	C	8	4.73	1	Thinly laminated grey SILTSTONE.	A+P	106.67	46.25	40.23	4.96	73.92	0.91	1.19	1.08
BH14	4.73	C	8	4.73	2	Thinly laminated grey SILTSTONE.	I+P	53.98	46.44	41.95	1.91	53.70	0.66	1.03	0.68

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result									
Project No. LT1983															
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method									
Client Structural Soils Ltd															
Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH14	5.20	C	9	5.20	1	Thinly laminated grey SANDSTONE. Tested outside calibrated range of device	D+L	106.62	106.65	104.85	0.11	105.75	0.01	1.4	0.01
BH14	5.20	C	9	5.20	2	Thinly laminated grey SANDSTONE.	A+P	106.64	64.32	57.68	10.12	88.50	1.29	1.29	1.67
Key															
Point Load Type	D	Diametral				A	Axial								
(Combination of)	I	Irregular lump				B	Block								
	L	Parallel to planes of weakness				P	Perpendicular to planes of weakness								
	X	Invalid failure of point load (not broken between points of load application)													
Dimensions	L	Distance between contact points and nearest free end (not applicable to axial tests)													
	W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump													
	D	Distance between platens when just in contact with specimen													
	D'	Distance between platens at point of failure													
	De	Equivalent core diameter				Is	P/De2								
	Is(50)	F x Is				F	(De/50)0.45								
	Is(50)	point load strength index corrected for a diametral test of core diameter 50mm													
		For Axial/Lump tests De2 = (4/Pi) x (W x D')							For Diametral tests De2 = D x D'						
Approved by:						Results apply to samples as received.									
Steve Harper						Print date 31/10/2024									
Revision No. 3.00						Issue Date 07/12/2023									
															

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH14	8.40	C	10	8.40	1	Thinly laminated grey SILTSTONE. Tested outside calibrated range of device	D+L+X	105.37	104.49	101.63	0.37	103.05	0.03	1.38	0.05
BH14	8.40	C	10	8.40	2	Thinly laminated grey SILTSTONE.	A+P+X	104.93	54.25	48.91	1.26	80.84	0.19	1.24	0.24

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH15	10.10	C	16	10.10	1	Grey SANDSTONE.	D	100.61	100.64	89.16	11.06	94.73	1.23	1.33	1.64
BH15	10.10	C	16	10.10	2	Grey SANDSTONE.	A	100.65	71.42	65.37	9.9	91.53	1.18	1.31	1.55

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

Approved by:		Results apply to samples as received.		
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH15	12.70	C	18	12.70	1	Grey SANDSTONE.	D	100.51	100.78	95.32	8.2	98.01	0.85	1.35	1.16
BH15	12.70	C	18	12.70	2	Grey SANDSTONE.	A	100.5	63.53	56.86	8.08	85.30	1.11	1.27	1.41

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH15	13.60	C	19	13.60	1	Thinly laminated grey SILTSTONE.	D+L+X	54.17	53.47	51.63	0.52	52.54	0.19	1.02	0.19
BH15	13.60	C	19	13.60	2	Thinly laminated grey SILTSTONE.	A+P	54.31	32.07	29.01	0.63	44.79	0.31	0.95	0.3

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
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Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH15	14.80	C	20	14.80	1	Thinly laminated grey SILTSTONE.	D+L	100.89	100.83	95.64	1.32	98.20	0.14	1.35	0.19
BH15	14.80	C	20	14.80	2	Thinly laminated grey SILTSTONE.	A+P	100.91	56.39	41.62	1.54	73.13	0.29	1.19	0.34

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

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Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH15	17.25	C	22	17.25	1	Thinly laminated brown SANDSTONE.	D+L	99.87	100.71	97.68	1.85	99.18	0.19	1.36	0.26
BH15	17.25	C	22	17.25	2	Thinly laminated brown SANDSTONE.	A+P	100.19	53.37	47.6	3.89	77.92	0.64	1.22	0.78

Key

Point Load Type

(Combination of)

Dimensions

D Diametral

I Irregular lump

L Parallel to planes of weakness

X Invalid failure of point load (not broken between points of load application)

L Distance between contact points and nearest free end (not applicable to axial tests)

W Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

D Distance between platens when just in contact with specimen

D' Distance between platens at point of failure

De Equivalent core diameter

Is(50) F x Is

Is(50) point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A Axial

B Block

P Perpendicular to planes of weakness

Is P/De2

F (De/50)0.45

For Diametral tests $De2 = D \times D'$

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Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	11.45	C	14	11.45	1	Grey mottled brown SANDSTONE.	D	100.66	100.74	96.86	6.44	98.78	0.66	1.36	0.9
BH16	11.45	C	14	11.45	2	Grey mottled brown SANDSTONE.	A	100.75	68.51	58.36	7.46	86.52	1	1.28	1.28

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

For Diametral tests $De2 = D \times D'$

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Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	12.40	C	15	12.40	1	Thinly laminated grey mottled brown SANDSTONE.	D+L	101.01	101.04	97.84	4.41	99.43	0.45	1.36	0.61
BH16	12.40	C	15	12.40	2	Thinly laminated grey mottled brown SANDSTONE.	A+P	100.85	61.58	53.77	9.46	83.09	1.37	1.26	1.72

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

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Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	14.40	C	16	14.40	1	Fractured thinly laminated grey SILTSTONE. Tested outside calibrated range of device	I+P+X	61.38	44.51	41.59	0.27	57.01	0.08	1.06	0.09
BH16	14.40	C	16	14.40	2	Fractured thinly laminated grey SILTSTONE.	I+L	59.66	50.22	47.1	0.73	59.81	0.2	1.08	0.22

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/Pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

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Client Structural Soils Ltd															

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	16.30	C	17	16.30	1	Grey SANDSTONE.	D	100.94	100.9	91.97	8.33	96.33	0.9	1.34	1.21
BH16	16.30	C	17	16.30	2	Grey SANDSTONE.	A	100.78	64.58	50.61	9.58	80.59	1.48	1.24	1.83

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

A

B

P

Is

F

P/De2

(De/50)0.45

Axial

Block

Perpendicular to planes of weakness

For Diametral tests $De2 = D \times D'$

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	7.00	C	11	7.00	1	Thinly laminated brownish grey SILTSTONE. Tested outside calibrated range of device	A+P+X	101.15	37.35	32.88	0.3	65.07	0.07	1.13	0.08
BH16	7.00	C	11	7.00	2	Thinly laminated brownish grey SILTSTONE. Tested outside calibrated range of device	A+P+X	101.1	69.1	64.74	0.11	91.29	0.01	1.31	0.02

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests $De2 = (4/\pi) \times (W \times D')$

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests $De2 = D \times D'$

Axial

Block

Perpendicular to planes of weakness

P/De2

(De/50)0.45

Approved by:		Results apply to samples as received.		
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

Project Name A635 Barnsley Bus Rapid Transit Route						Point Load Index Result							
Project No. LT1983													
Engineer Structural Soils Ltd						Test method: ISRM 1985 : Suggested Method							
Client Structural Soils Ltd													

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m2	F	Is(50) MN/m2
BH16	8.65	C	12	8.65	1	Thinly laminated grey SILTSTONE. Tested outside calibrated range of device	D+L	101.25	100.95	97.83	0	99.38	0	1.36	0
BH16	8.65	C	12	8.65	2	Thinly laminated grey SILTSTONE.	A+P+X	101.37	79.35	73.2	0.52	97.20	0.06	1.35	0.07

Key

Point Load Type

(Combination of)

Dimensions

D

I

L

X

L

W

D

D'

De

Is(50)

Is(50)

For Axial/Lump tests De2 = (4/Pi) x (W x D')

Diametral

Irregular lump

Parallel to planes of weakness

Invalid failure of point load (not broken between points of load application)

Distance between contact points and nearest free end (not applicable to axial tests)

Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump

Distance between platens when just in contact with specimen

Distance between platens at point of failure

Equivalent core diameter

F x Is

point load strength index corrected for a diametral test of core diameter 50mm

A

B

P

Is

F

For Diametral tests De2 = D x D'

Axial

Block

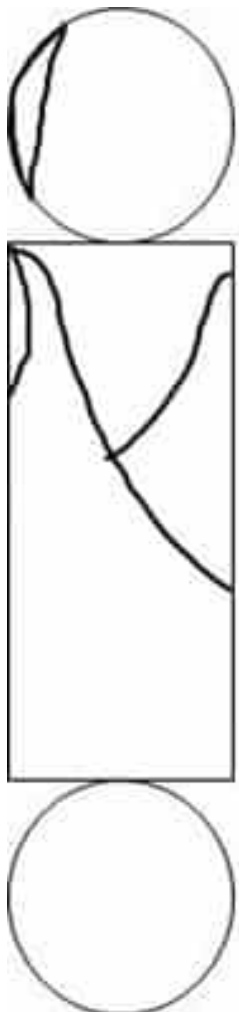
Perpendicular to planes of weakness

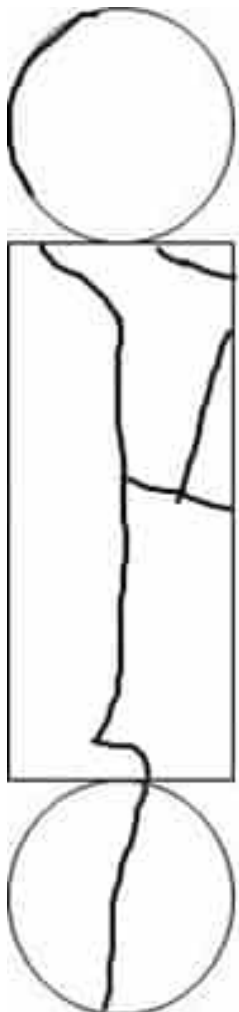
P/De2

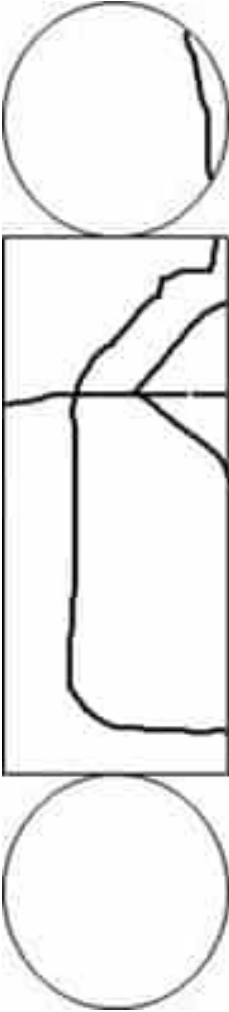
(De/50)0.45

Approved by:		Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 3.00		Issue Date 07/12/2023		

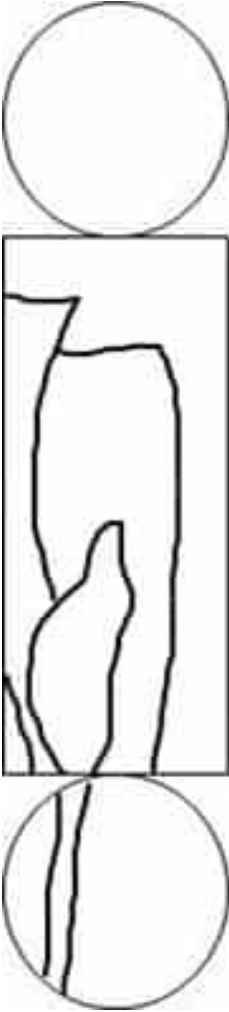
Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH02
Project No. LT1983				Sample Depth 15.70m
Engineer Structural Soils Ltd				Sample Number 22
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 15.70m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 11/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	284.52	285.23	284.9
Diameter (top)	mm	101.47	101.35	101.4
Diameter (middle)	mm	101.37	101.39	Length/diameter ratio
Diameter (base)	mm	101.45	101.46	
Area	mm ²	8077.8	Failure sketch 	
Mass	g	5524		
Test details				
Test duration	min	09:43		
Failure load	kN	325.7		
Stress rate	kN/min	33.5		
U.C.S.	MPa	40.3		
Mode of failure		Irregular		
Loading axis relative to anisotropy	72 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	08/10/2024			
Additional specimen details				
Moisture content	%	6.4		
Bulk density	kg/m ³	2400		
Dry density	kg/m ³	2260		
Test Remarks				
Specimen Remarks				
Approved by:	Leeds Laboratory	Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 2.07		Issue Date 01/05/2024		

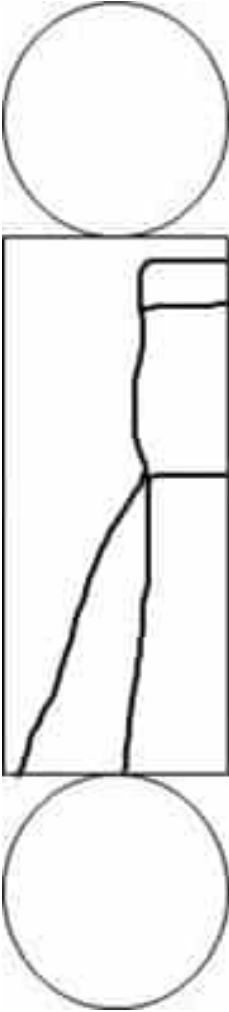
Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH06
Project No. LT1983				Sample Depth 16.40m
Engineer Structural Soils Ltd				Sample Number 18
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 16.40m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 20/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	147.60	147.75	147.7
Diameter (top)	mm	54.22	54.21	54.2
Diameter (middle)	mm	54.24	54.27	Length/diameter ratio
Diameter (base)	mm	54.22	54.27	
Area	mm ²	2310.5	Failure sketch 	
Mass	g	859.29		
Test details				
Test duration	min	08:36		
Failure load	kN	77.8		
Stress rate	kN/min	9.0		
U.C.S.	MPa	33.7		
Mode of failure		Shear		
Loading axis relative to anisotropy	78 DEG T LAMINATIONS			
Machine type used in test	Controls Pilot 4			
Date of test	21/10/2024			
Additional specimen details				
Moisture content	%	3.5		
Bulk density	kg/m ³	2520		
Dry density	kg/m ³	2430		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

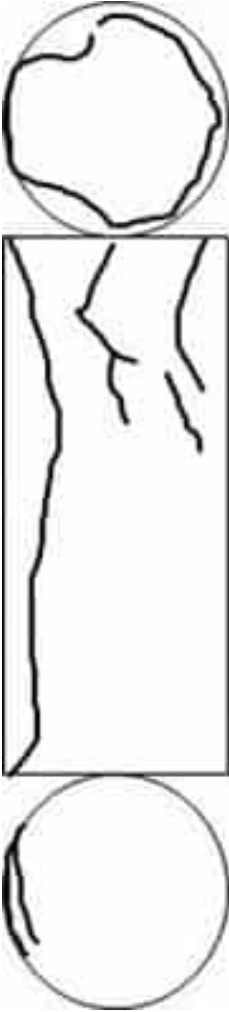
Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH07
Project No. LT1983				Sample Depth 7.19m
Engineer Structural Soils Ltd				Sample Number 13
Employer Structural Soils Ltd				Sample Type C
Description Thinly interlaminated grey SILTSTONE and SANDSTONE.			Specimen Depth 7.19m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 04/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	272.26	271.82	272.0
Diameter (top)	mm	106.23	106.50	106.4
Diameter (middle)	mm	106.46	106.61	Length/diameter ratio
Diameter (base)	mm	106.37	106.48	
Area	mm ²	8898.4	Failure sketch 	
Mass	g	6168		
Test details				
Test duration	min	05:59		
Failure load	kN	248.0		
Stress rate	kN/min	41.4		
U.C.S.	MPa	27.9		
Mode of failure		Axial		
Loading axis relative to anisotropy	90 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	10/10/2024			
Additional specimen details				
Moisture content	%	3.4		
Bulk density	kg/m ³	2550		
Dry density	kg/m ³	2460		
Test Remarks				
Specimen Remarks				
Approved by:	Leeds Laboratory	Results apply to samples as received.		 SOIL engineering
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		

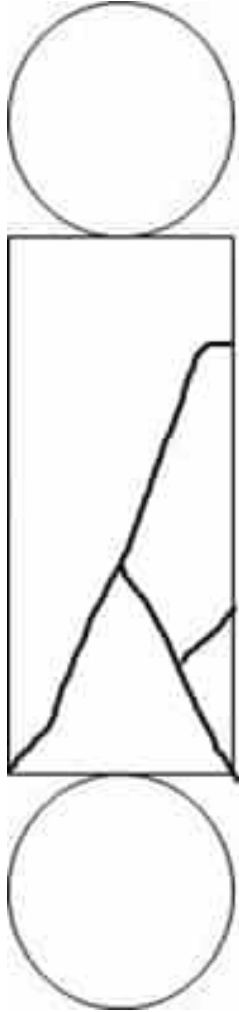
Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH08
Project No. LT1983				Sample Depth 13.50m
Engineer Structural Soils Ltd				Sample Number 32
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 13.50m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 21/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	261.30	262.09	261.7
Diameter (top)	mm	105.86	105.90	106.2
Diameter (middle)	mm	106.37	106.11	Length/diameter ratio
Diameter (base)	mm	106.55	106.46	
Area	mm ²	8859.5	Failure sketch 	
Mass	g	5986		
Test details				
Test duration	min	08:19		
Failure load	kN	401.5		
Stress rate	kN/min	48.3		
U.C.S.	MPa	45.3		
Mode of failure		Irregular		
Loading axis relative to anisotropy	90 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Autamax 5			
Date of test	16/10/2024			
Additional specimen details				
Moisture content	%	2.9		
Bulk density	kg/m ³	2580		
Dry density	kg/m ³	2510		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH08	
Project No. LT1983				Sample Depth 15.15m	
Engineer Structural Soils Ltd				Sample Number 34	
Employer Structural Soils Ltd				Sample Type C	
Description Thinly laminated grey SANDSTONE.				Specimen Depth 15.15m	
				Specimen Number 1	
Date and method of sampling		Sample rotary cored on 22/08/2024			
Storage history and environment		Not recorded			
Sample details				Mean	
Length	mm	149.29	149.28	149.3	
Diameter (top)	mm	54.25	54.26	54.3	
Diameter (middle)	mm	54.31	54.30	Length/diameter ratio	
Diameter (base)	mm	54.22	54.26		
Area	mm ²	2312.9	Failure sketch 		
Mass	g	865.85			
Test details					
Test duration	min	08:51			
Failure load	kN	96.2			
Stress rate	kN/min	10.9			
U.C.S.	MPa	41.6			
Mode of failure		Irregular			
Loading axis relative to anisotropy	85 DEG TO LAMINATIONS				
Machine type used in test	Controls 1300 / Automax 5				
Date of test	17/10/2024				
Additional specimen details					
Moisture content	%	4.2			
Bulk density	kg/m ³	2510			
Dry density	kg/m ³	2410			
Test Remarks					
Specimen Remarks					
Approved by:		Leeds Laboratory		Results apply to samples as received.	
Steve Harper				Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering	

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH08
Project No. LT1983				Sample Depth 18.40m
Engineer Structural Soils Ltd				Sample Number 37
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 18.40m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 22/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	293.21	292.64	292.9
Diameter (top)	mm	106.20	106.29	106.3
Diameter (middle)	mm	106.28	106.29	Length/diameter ratio
Diameter (base)	mm	106.34	106.35	
Area	mm ²	8873.4	Failure sketch 	
Mass	g	6582		
Test details				
Test duration	min	07:18		
Failure load	kN	347.5		
Stress rate	kN/min	47.6		
U.C.S.	MPa	39.2		
Mode of failure		Irregular		
Loading axis relative to anisotropy	85 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	21/10/2024			
Additional specimen details				
Moisture content	%	3.9		
Bulk density	kg/m ³	2530		
Dry density	kg/m ³	2440		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

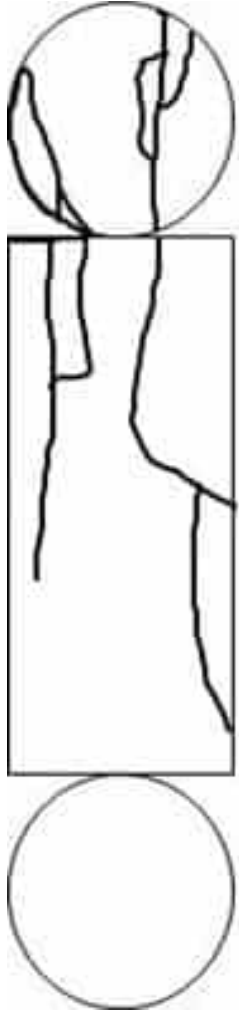
Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH09
Project No. LT1983				Sample Depth 13.50m
Engineer Structural Soils Ltd				Sample Number 40
Employer Structural Soils Ltd				Sample Type C
Description Thinly interlaminated grey SANDSTONE and SILTSTONE.			Specimen Depth 13.50m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 28/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	149.65	149.73	149.7
Diameter (top)	mm	53.87	53.79	53.8
Diameter (middle)	mm	53.81	53.92	Length/diameter ratio
Diameter (base)	mm	53.85	53.76	
Area	mm ²	2276.1	Failure sketch 	
Mass	g	878.26		
Test details				
Test duration	min	05:38		
Failure load	kN	50.3		
Stress rate	kN/min	8.9		
U.C.S.	MPa	22.1		
Mode of failure		Irregular		
Loading axis relative to anisotropy	75 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	10/10/2024			
Additional specimen details				
Moisture content	%	2.6		
Bulk density	kg/m ³	2580		
Dry density	kg/m ³	2510		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH09
Project No. LT1983				Sample Depth 16.35m
Engineer Structural Soils Ltd				Sample Number 42
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 16.35m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 28/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	134.69	134.96	134.8
Diameter (top)	mm	54.20	54.23	54.2
Diameter (middle)	mm	54.21	54.20	Length/diameter ratio
Diameter (base)	mm	54.24	54.21	
Area	mm ²	2308.5	Failure sketch 	
Mass	g	796.89		
Test details				
Test duration	min	05:03		
Failure load	kN	53.2		
Stress rate	kN/min	10.5		
U.C.S.	MPa	23		
Mode of failure		Irregular		
Loading axis relative to anisotropy	85 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	14/10/2024			
Additional specimen details				
Moisture content	%	2.8		
Bulk density	kg/m ³	2560		
Dry density	kg/m ³	2490		
Test Remarks				
Specimen Remarks				
Approved by:	Leeds Laboratory	Results apply to samples as received.		 SOIL engineering
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH10
Project No. LT1983				Sample Depth 15.80m
Engineer Structural Soils Ltd				Sample Number 40
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 15.80m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 05/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	301.61	302.25	301.9
Diameter (top)	mm	106.67	106.66	106.8
Diameter (middle)	mm	106.85	106.82	Length/diameter ratio
Diameter (base)	mm	106.80	106.94	
Area	mm ²	8956.8	Failure sketch 	
Mass	g	6840		
Test details				
Test duration	min	06:23		
Failure load	kN	304.2		
Stress rate	kN/min	47.7		
U.C.S.	MPa	34		
Mode of failure		Shear		
Loading axis relative to anisotropy	90 deg to laminations			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	16/10/2024			
Additional specimen details				
Moisture content	%	3.6		
Bulk density	kg/m ³	2530		
Dry density	kg/m ³	2440		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH11
Project No. LT1983				Sample Depth 15.00m
Engineer Structural Soils Ltd				Sample Number 43
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 15.00m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 11/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	141.68	141.72	141.7
Diameter (top)	mm	53.84	53.89	53.9
Diameter (middle)	mm	53.86	53.87	Length/diameter ratio
Diameter (base)	mm	53.84	53.85	
Area	mm ²	2278.2	Failure sketch 	
Mass	g	814.24		
Test details				
Test duration	min	07:23		
Failure load	kN	88.5		
Stress rate	kN/min	12.0		
U.C.S.	MPa	38.8		
Mode of failure		Irregular		
Loading axis relative to anisotropy	86 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	09/10/2024			
Additional specimen details				
Moisture content	%	3.3		
Bulk density	kg/m ³	2520		
Dry density	kg/m ³	2440		
Test Remarks				
Specimen Remarks				
Approved by:	Leeds Laboratory	Results apply to samples as received.		 SOIL engineering
Steve Harper		Print date 31/10/2024		
Revision No. 2.07		Issue Date 01/05/2024		

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH11
Project No. LT1983				Sample Depth 17.14m
Engineer Structural Soils Ltd				Sample Number 46
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE.			Specimen Depth 17.14m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 11/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	299.10	298.46	298.8
Diameter (top)	mm	106.14	106.19	106.4
Diameter (middle)	mm	106.51	106.49	Length/diameter ratio
Diameter (base)	mm	106.51	106.43	
Area	mm ²	8887.8	Failure sketch 	
Mass	g	6442		
Test details				
Test duration	min	06:40		
Failure load	kN	321.5		
Stress rate	kN/min	48.2		
U.C.S.	MPa	36.2		
Mode of failure		Shear		
Loading axis relative to anisotropy	83 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	09/10/2024			
Additional specimen details				
Moisture content	%	6.1		
Bulk density	kg/m ³	2430		
Dry density	kg/m ³	2290		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH15
Project No. LT1983				Sample Depth 9.20m
Engineer Structural Soils Ltd				Sample Number 15
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated grey SANDSTONE with some brown staining.			Specimen Depth 9.20m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 29/08/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	114.58	114.97	114.8
Diameter (top)	mm	54.12	54.11	54.2
Diameter (middle)	mm	54.17	54.21	Length/diameter ratio
Diameter (base)	mm	54.17	54.21	
Area	mm ²	2304.2	Failure sketch 	
Mass	g	660.51		
Test details				
Test duration	min	04:45		
Failure load	kN	39.5		
Stress rate	kN/min	8.3		
U.C.S.	MPa	17.1		
Mode of failure		Irregular		
Loading axis relative to anisotropy	80 deg to laminations			
Machine type used in test	Controls Pilot 4			
Date of test	21/10/2024			
Additional specimen details				
Moisture content	%	4.8		
Bulk density	kg/m ³	2500		
Dry density	kg/m ³	2380		
Test Remarks				
Tested on specimen with length to diameter ratio outside 2.5-3.0 recommendation.				
Specimen Remarks				
Approved by:		Leeds Laboratory		Results apply to samples as received.
Steve Harper				Print date 31/10/2024
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

Project Name A635 Barnsley Bus Rapid Transit Route		Uniaxial Compressive Strength I.S.R.M. Suggested Methods 1979 for Determination of Uniaxial Compressive Strength Part 1		Hole ID BH16
Project No. LT1983				Sample Depth 9.75m
Engineer Structural Soils Ltd				Sample Number 13
Employer Structural Soils Ltd				Sample Type C
Description Thinly laminated greyish brown SANDSTONE.			Specimen Depth 9.75m	
			Specimen Number 1	
Date and method of sampling		Sample rotary cored on 03/09/2024		
Storage history and environment		Not recorded		
Sample details				Mean
Length	mm	133.14	133.19	133.2
Diameter (top)	mm	54.21	54.24	54.2
Diameter (middle)	mm	54.22	54.25	Length/diameter ratio
Diameter (base)	mm	54.22	54.21	
Area	mm ²	2309.3	Failure sketch 	
Mass	g	743.87		
Test details				
Test duration	min	04:26		
Failure load	kN	46.2		
Stress rate	kN/min	10.4		
U.C.S.	MPa	20		
Mode of failure		Irregular		
Loading axis relative to anisotropy	74 DEG TO LAMINATIONS			
Machine type used in test	Controls 1300 / Automax 5			
Date of test	21/10/2024			
Additional specimen details				
Moisture content	%	5.6		
Bulk density	kg/m ³	2420		
Dry density	kg/m ³	2290		
Test Remarks				
Specimen Remarks				
Approved by:		Leeds Laboratory	Results apply to samples as received.	
Steve Harper			Print date 31/10/2024	
Revision No. 2.07		Issue Date 01/05/2024		 SOIL engineering

APPENDIX E - GEOENVIRONMENTAL TESTING

- (i) Laboratory Test Results
- (ii) Laboratory Accreditation Certificate

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07600
Issue Number: 1
Date: 12 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 02/08/24
Date Instructions Received: 05/08/24
Date Analysis Completed: 12/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/2	24/07600/4	24/07600/6	24/07600/7	24/07600/8	24/07600/9	24/07600/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	106	107	108	101	105			
Client Sample ID	BH08	BH08	BH08	BH08	BH08	BH09	BH09			
Depth to Top	1.40	3.40	5.40	6.70	7.90	0.10	3.40			
Depth To Bottom										
Date Sampled	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	01-Aug-24	01-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	6A	6A	6A	6A	4AE	6A			
% Stones >10mm _A	20.0	<0.1	<0.1	<0.1	<0.1	14.5	<0.1	% w/w	0.1	A-T-044
pH _D ^{M#}	-	-	-	-	-	8.24	-	pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	-	-	7.62	-	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	-	-	-	0.02	-	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	-	13	-	-	-	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	-	-	0.03	-	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	-	0.05	-	-	-	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	-	-	-	-	-	22.7	-	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	6	7	4	-	<1	32	4	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	<0.5	0.8	-	1.1	1.0	<0.5	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	21	37	24	-	39	401	41	mg/kg	1	A-T-024s
Chromium _D ^{M#}	11	25	27	-	20	91	20	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	41	25	28	-	31	765	25	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	-	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	21	22	24	-	57	74	21	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	1	2	-	5	3	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	43	51	80	-	127	971	50	mg/kg	5	A-T-024s

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/2	24/07600/4	24/07600/6	24/07600/7	24/07600/8	24/07600/9	24/07600/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	106	107	108	101	105			
Client Sample ID	BH08	BH08	BH08	BH08	BH08	BH09	BH09			
Depth to Top	1.40	3.40	5.40	6.70	7.90	0.10	3.40			
Depth To Bottom										
Date Sampled	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	01-Aug-24	01-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	6A	6A	6A	6A	4AE	6A			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	-	-	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	-	-	N/A	N/A			A-T-045

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/2	24/07600/4	24/07600/6	24/07600/7	24/07600/8	24/07600/9	24/07600/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	106	107	108	101	105			
Client Sample ID	BH08	BH08	BH08	BH08	BH08	BH09	BH09			
Depth to Top	1.40	3.40	5.40	6.70	7.90	0.10	3.40			
Depth To Bottom										
Date Sampled	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	01-Aug-24	01-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	6A	6A	6A	6A	4AE	6A			
PAH-16MS										
Acenaphthene _A ^{M#}	0.09	<0.01	<0.01	-	<0.01	0.15	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.05	<0.01	<0.01	-	<0.01	0.16	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.31	<0.02	<0.02	-	<0.02	0.74	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.42	<0.04	<0.04	-	<0.04	2.74	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.38	<0.04	<0.04	-	<0.04	3.42	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.40	<0.05	<0.05	-	<0.05	3.66	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.18	<0.05	<0.05	-	<0.05	1.71	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.16	<0.07	<0.07	-	<0.07	1.42	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.42	<0.06	<0.06	-	<0.06	2.60	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.04	<0.04	<0.04	-	<0.04	0.38	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.13	<0.08	<0.08	-	<0.08	6.10	<0.08	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.16	<0.01	<0.01	-	<0.01	0.16	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.18	<0.03	<0.03	-	<0.03	1.87	<0.03	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.26	<0.03	<0.03	-	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	1.13	<0.03	<0.03	-	<0.03	2.39	<0.03	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.95	<0.07	<0.07	-	<0.07	5.53	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	6.26	<0.08	<0.08	-	<0.08	33	<0.08	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/2	24/07600/4	24/07600/6	24/07600/7	24/07600/8	24/07600/9	24/07600/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	106	107	108	101	105			
Client Sample ID	BH08	BH08	BH08	BH08	BH08	BH09	BH09			
Depth to Top	1.40	3.40	5.40	6.70	7.90	0.10	3.40			
Depth To Bottom										
Date Sampled	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	31-Jul-24	01-Aug-24	01-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	6A	6A	6A	6A	4AE	6A			
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	-	-	-	-	15	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	-	-	-	-	10	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	-	-	-	-	17	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	-	-	-	-	17	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	-	-	-	-	-	64	-	mg/kg	1	A-T-055s
Ali >C35-C44 _A	-	-	-	-	-	22	-	mg/kg	1	A-T-055s
Total Aliphatics _A	-	-	-	-	-	146	-	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	-	-	-	-	14	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A	-	-	-	-	-	14	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	-	-	-	-	42	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	-	-	-	-	65	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	-	-	-	-	143	-	mg/kg	1	A-T-055s
Aro >C35-C44 _A	-	-	-	-	-	16	-	mg/kg	1	A-T-055s
Total Aromatics _A	-	-	-	-	-	293	-	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	-	-	-	-	-	439	-	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	-	-	-	-	<0.05	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/17	24/07600/18	24/07600/19	24/07600/20	24/07600/21			Units	Limit of Detection	Method ref
Client Sample No	109	110	111	101	102					
Client Sample ID	BH09	BH09	BH09	BH12	BH12					
Depth to Top	7.10	8.10	9.60	0.15	0.70					
Depth To Bottom										
Date Sampled	01-Aug-24	01-Aug-24	01-Aug-24	31-Jul-24	31-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	6A	6AE	6A	4AE	5ABE					
% Stones >10mm _A	<0.1	<0.1	<0.1	24.9	7.2			% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	5.78	-	-	-			pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	50	-	-	-			mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	<0.04	-	-	-			% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.02	-	-	-			% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	-	<1	<1	<1			mg/kg	1	A-T-042SFCN
Cyanide (total) _A ^{M#}	<1	-	<1	<1	<1			mg/kg	1	A-T-042STCN
Arsenic _D ^{M#}	4	-	7	11	6			mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	-	1.1	0.6	0.6			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	37	-	39	80	30			mg/kg	1	A-T-024s
Chromium _D ^{M#}	21	-	22	21	15			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	-	<1	<1	<1			mg/kg	1	A-T-040s
Lead _D ^{M#}	23	-	33	428	61			mg/kg	1	A-T-024s
Mercury _D	<0.17	-	<0.17	0.39	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	20	-	66	17	35			mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	-	3	<1	<1			mg/kg	1	A-T-024s
Zinc _D ^{M#}	58	-	112	158	70			mg/kg	5	A-T-024s

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/17	24/07600/18	24/07600/19	24/07600/20	24/07600/21			Units	Limit of Detection	Method ref
Client Sample No	109	110	111	101	102					
Client Sample ID	BH09	BH09	BH09	BH12	BH12					
Depth to Top	7.10	8.10	9.60	0.15	0.70					
Depth To Bottom										
Date Sampled	01-Aug-24	01-Aug-24	01-Aug-24	31-Jul-24	31-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	6A	6AE	6A	4AE	5ABE					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-	-	NAD	NAD					A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-					A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	-	N/A	N/A					A-T-045

Envirolab Job Number: 24/07600

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07600/17	24/07600/18	24/07600/19	24/07600/20	24/07600/21			Units	Limit of Detection	Method ref
Client Sample No	109	110	111	101	102					
Client Sample ID	BH09	BH09	BH09	BH12	BH12					
Depth to Top	7.10	8.10	9.60	0.15	0.70					
Depth To Bottom										
Date Sampled	01-Aug-24	01-Aug-24	01-Aug-24	31-Jul-24	31-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	6A	6AE	6A	4AE	5ABE					
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	-	<0.01	0.93	<0.10			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	-	<0.01	1.29	0.50			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	-	<0.02	5.95	1.12			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	-	<0.04	53.7	9.30			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	-	<0.04	43.5	6.54			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	-	<0.05	65	7.16			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	-	<0.05	21.2	1.98			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	-	<0.07	24.9	2.55			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	-	<0.06	64.4	6.51			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	-	<0.04	6.96	0.69			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	-	<0.08	71.5	13.7			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	-	<0.01	0.86	0.16			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	-	<0.03	25.8	2.63			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	-	<0.03	<0.30	<0.30			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	-	<0.03	15.6	2.54			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	-	<0.07	68.6	13.1			mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	-	<0.08	470	68.5			mg/kg	0.01	A-T-019s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/07600

Date Received: 05/08/2024 (am)

Cool Box Temperatures (°C): 24.2, 24.1, 24.5, 23.9

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07600/2	24/07600/4	24/07600/6	24/07600/7	24/07600/8	24/07600/9	24/07600/13	24/07600/17	24/07600/18	24/07600/19	24/07600/20	24/07600/21
Client Sample No	102	104	106	107	108	101	105	109	110	111	101	102
Client Sample ID/Depth	BH08 1.40m	BH08 3.40m	BH08 5.40m	BH08 6.70m	BH08 7.90m	BH09 0.10m	BH09 3.40m	BH09 7.10m	BH09 8.10m	BH09 9.60m	BH12 0.15m	BH12 0.70m
Date Sampled	31/07/24	31/07/24	31/07/24	31/07/24	31/07/24	01/08/24	01/08/24	01/08/24	01/08/24	01/08/24	31/07/24	31/07/24
A-T-019s	09/08/2024	09/08/2024	09/08/2024		09/08/2024	09/08/2024	09/08/2024	09/08/2024		09/08/2024	09/08/2024	09/08/2024
A-T-022s						09/08/2024						
A-T-024s	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
A-T-026s				12/08/2024		12/08/2024			12/08/2024			
A-T-028s				09/08/2024					09/08/2024			
A-T-031s				09/08/2024		09/08/2024			09/08/2024			
A-T-032s						12/08/2024						
A-T-040s	12/08/2024	12/08/2024	12/08/2024		12/08/2024	12/08/2024	12/08/2024	12/08/2024		12/08/2024	12/08/2024	12/08/2024
A-T-042sFCN	08/08/2024	08/08/2024	08/08/2024		08/08/2024	08/08/2024	08/08/2024	08/08/2024		08/08/2024	09/08/2024	08/08/2024
A-T-042sTCN	08/08/2024	08/08/2024	08/08/2024		08/08/2024	08/08/2024	08/08/2024	08/08/2024		08/08/2024	08/08/2024	08/08/2024
A-T-044	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
A-T-045	06/08/2024	06/08/2024	06/08/2024			06/08/2024	06/08/2024	06/08/2024			06/08/2024	06/08/2024
A-T-055s						09/08/2024						
Calc-As Recd						09/08/2024						

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07631
Issue Number: 1
Date: 12 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 31/07/24
Date Instructions Received: 05/08/24
Date Analysis Completed: 12/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07631

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/07631/2	24/07631/6	24/07631/8	24/07631/12	24/07631/13			Units	Limit of Detection	Method ref
Client Sample No	102	102	104	108	109					
Client Sample ID	BH13	BH06	BH06	BH06	BH06					
Depth to Top	0.50	0.30	1.00	5.00	6.00					
Depth To Bottom										
Date Sampled	30-Jul-24	29-Jul-24	29-Jul-24	30-Jul-24	30-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	6AE	6A	6A					
% Stones >10mm _A	15.8	17.9	6.2	1.7	<0.1			% w/w	0.1	A-T-044
pH _D ^{M#}	-	8.73	-	-	-			pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	-	-	6.87	-			pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.06	-	-	-			g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	-	33	-			mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	-	-	<0.02	-			% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	-	<0.01	-			% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	<1	-	<1			mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	-	<1			mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	-	22.5	-	-	-			% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	13	21	<1	-	<1			mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.6	0.7	<0.5	-	0.6			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	44	113	38	-	26			mg/kg	1	A-T-024s
Chromium _D ^{M#}	9	48	18	-	24			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	-	<1			mg/kg	1	A-T-040s
Lead _D ^{M#}	53	72	15	-	17			mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	-	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	21	28	30	-	43			mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	2	<1	-	<1			mg/kg	1	A-T-024s
Zinc _D ^{M#}	25	82	50	-	81			mg/kg	5	A-T-024s

Envirolab Job Number: 24/07631

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07631/2	24/07631/6	24/07631/8	24/07631/12	24/07631/13			Units	Limit of Detection	Method ref
Client Sample No	102	102	104	108	109					
Client Sample ID	BH13	BH06	BH06	BH06	BH06					
Depth to Top	0.50	0.30	1.00	5.00	6.00					
Depth To Bottom										
Date Sampled	30-Jul-24	29-Jul-24	29-Jul-24	30-Jul-24	30-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	6AE	6A	6A					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	-	-					A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-					A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	-	-					A-T-045

Envirolab Job Number: 24/07631

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07631/2	24/07631/6	24/07631/8	24/07631/12	24/07631/13			Units	Limit of Detection	Method ref
Client Sample No	102	102	104	108	109					
Client Sample ID	BH13	BH06	BH06	BH06	BH06					
Depth to Top	0.50	0.30	1.00	5.00	6.00					
Depth To Bottom										
Date Sampled	30-Jul-24	29-Jul-24	29-Jul-24	30-Jul-24	30-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	6AE	6A	6A					
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	0.07	<0.01	-	<0.01			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.02	0.07	<0.01	-	<0.01			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.03	0.49	<0.02	-	<0.02			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.17	1.05	<0.04	-	<0.04			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.13	1.02	<0.04	-	<0.04			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.17	1.41	<0.05	-	<0.05			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.06	0.60	<0.05	-	<0.05			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	0.50	<0.07	-	<0.07			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.17	1.06	<0.06	-	<0.06			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	0.16	<0.04	-	<0.04			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.25	2.53	<0.08	-	<0.08			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	0.07	<0.01	-	<0.01			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.06	0.70	<0.03	-	<0.03			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.07	0.24	<0.03	-	<0.03			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.18	1.25	<0.03	-	<0.03			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.24	2.17	<0.07	-	<0.07			mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.55	13.4	<0.08	-	<0.08			mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07631

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07631/2	24/07631/6	24/07631/8	24/07631/12	24/07631/13			Units	Limit of Detection	Method ref
Client Sample No	102	102	104	108	109					
Client Sample ID	BH13	BH06	BH06	BH06	BH06					
Depth to Top	0.50	0.30	1.00	5.00	6.00					
Depth To Bottom										
Date Sampled	30-Jul-24	29-Jul-24	29-Jul-24	30-Jul-24	30-Jul-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	6AE	6A	6A					
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	-	0.02	-	-	-			mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	7	-	-	-			mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	<5	-	-	-			mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	8	-	-	-			mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	10	-	-	-			mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	-	78	-	-	-			mg/kg	1	A-T-055s
Ali >C35-C44 _A	-	19	-	-	-			mg/kg	1	A-T-055s
Total Aliphatics _A	-	127	-	-	-			mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	7	-	-	-			mg/kg	1	A-T-055s
Aro >C10-C12 _A	-	7	-	-	-			mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	21	-	-	-			mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	25	-	-	-			mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	43	-	-	-			mg/kg	1	A-T-055s
Aro >C35-C44 _A	-	9	-	-	-			mg/kg	1	A-T-055s
Total Aromatics _A	-	114	-	-	-			mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	-	241	-	-	-			mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s
MTBE _A [#]	-	<0.01	-	-	-			mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford, West Yorkshire, UK, WF10 1NJ	Project No:	24/07631
Project:	A635 Barnsley Bus Rapid Transit Route	Date Received:	05/08/2024 (am)
Clients Project No:	765865	Cool Box Temperatures (°C):	20.9, 19.8

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07631/2	24/07631/6	24/07631/8	24/07631/12	24/07631/13
Client Sample No	102	102	104	108	109
Client Sample ID/Depth	BH13 0.50m	BH06 0.30m	BH06 1.00m	BH06 5.00m	BH06 6.00m
Date Sampled	30/07/24	29/07/24	29/07/24	30/07/24	30/07/24
A-T-019s	08/08/2024	08/08/2024	08/08/2024		08/08/2024
A-T-022s		08/08/2024			
A-T-024s	12/08/2024	12/08/2024	12/08/2024	12/08/2024	12/08/2024
A-T-026s		12/08/2024		12/08/2024	
A-T-028s				09/08/2024	
A-T-031s		09/08/2024		09/08/2024	
A-T-032s		12/08/2024			
A-T-040s	12/08/2024	12/08/2024	12/08/2024		12/08/2024
A-T-042sFCN	08/08/2024	08/08/2024	08/08/2024		08/08/2024
A-T-042sTCN	08/08/2024	08/08/2024	08/08/2024		08/08/2024
A-T-044	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
A-T-045	06/08/2024	06/08/2024	06/08/2024		
A-T-055s		09/08/2024			
Calc-As Recd		09/08/2024			

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

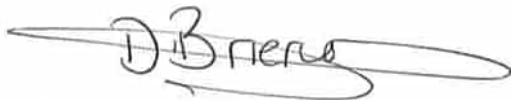
FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07805
Issue Number: 1
Date: 19 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Keziah Dalton/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 05/08/24
Date Instructions Received: 09/08/24
Date Analysis Completed: 19/08/24

Approved by:



Danielle Brierley
Client Services Supervisor

Envirolab Job Number: 24/07805

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7					Units	Limit of Detection	Method ref
Client Sample No	101	102	107							
Client Sample ID	BH10	BH10	BH10							
Depth to Top	0.10	0.30	4.40							
Depth To Bottom										
Date Sampled	02-Aug-24	02-Aug-24	02-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	4AE	6A							
% Stones >10mm _A	29.1	9.3	-					% w/w	0.1	A-T-044
pH _D ^{M#}	7.69	7.32	-					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.03	-					g/l	0.01	A-T-026s
Cyanide (free) _A ^{M#}	<1	<1	-					mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	-					mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	35.0	61.9	-					% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	18	26	-					mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.8	0.6	-					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	199	179	-					mg/kg	1	A-T-024s
Chromium _D ^{M#}	72	19	-					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	-					mg/kg	1	A-T-040s
Lead _D ^{M#}	134	96	-					mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	-					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	59	28	-					mg/kg	1	A-T-024s
Selenium _D ^{M#}	1	<1	-					mg/kg	1	A-T-024s
Zinc _D ^{M#}	427	65	-					mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	<0.005	-					mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	<0.005	-					mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	2	-					µg/l	1	A-T-025w
Cadmium (leachable) _A	-	<1	-					µg/l	1	A-T-025w
Copper (leachable) _A	-	23	-					µg/l	4	A-T-025w
Chromium (leachable) _A	-	<1	-					µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	<0.05	-					mg/l	0.05	A-T-040w
Lead (leachable) _A	-	14	-					µg/l	1	A-T-025w
Mercury (leachable) _A	-	<0.1	-					µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	<2	-					µg/l	2	A-T-025w
Selenium (leachable) _A	-	<1	-					µg/l	1	A-T-025w
Zinc (leachable) _A	-	12	-					µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	*	-							A-T-001

Envirolab Job Number: 24/07805

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7					Units	Limit of Detection	Method ref
Client Sample No	101	102	107							
Client Sample ID	BH10	BH10	BH10							
Depth to Top	0.10	0.30	4.40							
Depth To Bottom										
Date Sampled	02-Aug-24	02-Aug-24	02-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	4AE	6A							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos Matrix (visual) ₀	-	-	-							A-T-045
Asbestos Matrix (microscope) ₀	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 24/07805

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7					Units	Limit of Detection	Method ref
Client Sample No	101	102	107							
Client Sample ID	BH10	BH10	BH10							
Depth to Top	0.10	0.30	4.40							
Depth To Bottom										
Date Sampled	02-Aug-24	02-Aug-24	02-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	4AE	6A							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.10	0.03	-					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.10	0.02	-					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.29	0.13	-					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.50	0.26	-					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.68	0.16	-					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.82	0.26	-					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.50	0.07	-					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.70	0.11	-					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.81	0.28	-					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.40	<0.04	-					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.23	0.62	-					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.10	0.04	-					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.37	0.07	-					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.30	0.07	-					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.74	0.63	-					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	1.08 ^U	0.51	-					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	6.52	3.26	-					mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07805

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7					Units	Limit of Detection	Method ref
Client Sample No	101	102	107							
Client Sample ID	BH10	BH10	BH10							
Depth to Top	0.10	0.30	4.40							
Depth To Bottom										
Date Sampled	02-Aug-24	02-Aug-24	02-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	4AE	6A							
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	<0.02	-					µg/l	0.02	A-T-019w

Envirolab Job Number: 24/07805

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7					Units	Limit of Detection	Method ref
Client Sample No	101	102	107							
Client Sample ID	BH10	BH10	BH10							
Depth to Top	0.10	0.30	4.40							
Depth To Bottom										
Date Sampled	02-Aug-24	02-Aug-24	02-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	4AE	6A							
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	9	9	-					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	6	5	-					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	10	9	-					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	11	9	-					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	144	15	-					mg/kg	1	A-T-055s
Ali >C35-C44 _A	27	1	-					mg/kg	1	A-T-055s
Total Aliphatics _A	207	48	-					mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	8	5	-					mg/kg	1	A-T-055s
Aro >C10-C12 _A	7	5	-					mg/kg	1	A-T-055s
Aro >C12-C16 _A	19	16	-					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	22	18	-					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	54	24	-					mg/kg	1	A-T-055s
Aro >C35-C44 _A	36	1	-					mg/kg	1	A-T-055s
Total Aromatics _A	146	69	-					mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	353	117	-					mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.10	<0.10	-					mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/07805

Date Received: 09/08/2024 (am)

Cool Box Temperatures (°C): 18.5, 19.0

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07805/1	24/07805/2	24/07805/7
Client Sample No	101	102	107
Client Sample ID/Depth	BH10 0.10m	BH10 0.30m	BH10 4.40m
Date Sampled	02/08/24	02/08/24	02/08/24
A-T-019s	16/08/2024	16/08/2024	
A-T-019w		19/08/2024	
A-T-022s	15/08/2024	15/08/2024	
A-T-024s	16/08/2024	16/08/2024	
A-T-025w		16/08/2024	
A-T-026s	16/08/2024	16/08/2024	
A-T-031s	16/08/2024	16/08/2024	
A-T-032s	16/08/2024	16/08/2024	
A-T-040s	16/08/2024	16/08/2024	
A-T-040w		16/08/2024	
A-T-042sFCN	13/08/2024	13/08/2024	
A-T-042sTCN	13/08/2024	13/08/2024	
A-T-042wFCN		16/08/2024	
A-T-042wTCN		16/08/2024	
A-T-044	16/08/2024	16/08/2024	
A-T-045	13/08/2024	13/08/2024	13/08/2024
A-T-055s	14/08/2024	14/08/2024	
Calc-As Recd	15/08/2024	15/08/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07836
Issue Number: 1
Date: 20 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Keziah Dalton/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 09/08/24
Date Instructions Received: 12/08/24
Date Analysis Completed: 20/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07836

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07836/1	24/07836/4						Units	Limit of Detection	Method ref
Client Sample No	110	113								
Client Sample ID	BH10	BH10								
Depth to Top	7.30	9.10								
Depth To Bottom										
Date Sampled	05-Aug-24	05-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	3	5A								
% Stones >10mm _A	<0.1	17.2						% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	7.13						pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	71						mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	0.06						% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.04						% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	-						mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	-						mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	<1	-						mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.5	-						mg/kg	0.5	A-T-024s
Copper _D ^{M#}	23	-						mg/kg	1	A-T-024s
Chromium _D ^{M#}	21	-						mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	-						mg/kg	1	A-T-040s
Lead _D ^{M#}	16	-						mg/kg	1	A-T-024s
Mercury _D	<0.17	-						mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	29	-						mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	-						mg/kg	1	A-T-024s
Zinc _D ^{M#}	72	-						mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005	-						mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005	-						mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	<1	-						µg/l	1	A-T-025w
Cadmium (leachable) _A	<1	-						µg/l	1	A-T-025w
Copper (leachable) _A	<4	-						µg/l	4	A-T-025w
Chromium (leachable) _A	<1	-						µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05	-						mg/l	0.05	A-T-040w
Lead (leachable) _A	<1	-						µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1	-						µg/l	0.1	A-T-025w
Nickel (leachable) _A	<2	-						µg/l	2	A-T-025w
Selenium (leachable) _A	1	-						µg/l	1	A-T-025w
Zinc (leachable) _A	8	-						µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-								A-T-001

Envirolab Job Number: 24/07836

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07836/1	24/07836/4						Units	Limit of Detection	Method ref
Client Sample No	110	113								
Client Sample ID	BH10	BH10								
Depth to Top	7.30	9.10								
Depth To Bottom										
Date Sampled	05-Aug-24	05-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	3	5A								
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-								A-T-045
Asbestos Matrix (visual) _D	-	-								A-T-045
Asbestos Matrix (microscope) _D	-	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-								A-T-045

Envirolab Job Number: 24/07836

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07836/1	24/07836/4						Units	Limit of Detection	Method ref
Client Sample No	110	113								
Client Sample ID	BH10	BH10								
Depth to Top	7.30	9.10								
Depth To Bottom										
Date Sampled	05-Aug-24	05-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	3	5A								
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	-						mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	-						mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	-						mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	-						mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	-						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	-						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	-						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	-						mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	-						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	-						mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	-						mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.01	-						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	-						mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	-						mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	-						mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	-						mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	-						mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07836

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07836/1	24/07836/4						Units	Limit of Detection	Method ref
Client Sample No	110	113								
Client Sample ID	BH10	BH10								
Depth to Top	7.30	9.10								
Depth To Bottom										
Date Sampled	05-Aug-24	05-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	3	5A								
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/07836

Date Received: 12/08/2024 (am)

Cool Box Temperatures (°C): 20.1

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07836/1	24/07836/4
Client Sample No	110	113
Client Sample ID/Depth	BH10 7.30m	BH10 9.10m
Date Sampled	05/08/24	05/08/24
A-T-019s	19/08/2024	
A-T-019w	16/08/2024	
A-T-024s	19/08/2024	19/08/2024
A-T-025w	15/08/2024	
A-T-026s		16/08/2024
A-T-028s		19/08/2024
A-T-031s		20/08/2024
A-T-040s	16/08/2024	
A-T-040w	15/08/2024	
A-T-042sFCN	14/08/2024	
A-T-042sTCN	14/08/2024	
A-T-042wFCN	15/08/2024	
A-T-042wTCN	15/08/2024	
A-T-044	16/08/2024	16/08/2024
A-T-045	14/08/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07857
Issue Number: 1
Date: 20 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Keziah Dalton/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 09/08/24
Date Instructions Received: 12/08/24
Date Analysis Completed: 20/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07857

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07857/2									
Client Sample No	102									
Client Sample ID	BH16									
Depth to Top	1.10									
Depth To Bottom										
Date Sampled	07-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	6ABE									
								Units	Limit of Detection	Method ref
% Stones >10mm _A	<0.1							% w/w	0.1	A-T-044
Cyanide (free) _A ^{M#}	<1							mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	21							mg/kg	1	A-T-024s
Cadmium _D ^{M#}	1.4							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	84							mg/kg	1	A-T-024s
Chromium _D ^{M#}	29							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	165							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	36							mg/kg	1	A-T-024s
Selenium _D ^{M#}	1							mg/kg	1	A-T-024s
Zinc _D ^{M#}	528							mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005							mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005							mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	5							µg/l	1	A-T-025w
Cadmium (leachable) _A	<1							µg/l	1	A-T-025w
Copper (leachable) _A	15							µg/l	4	A-T-025w
Chromium (leachable) _A	<1							µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05							mg/l	0.05	A-T-040w
Lead (leachable) _A	4							µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1							µg/l	0.1	A-T-025w
Nickel (leachable) _A	2							µg/l	2	A-T-025w
Selenium (leachable) _A	1							µg/l	1	A-T-025w
Zinc (leachable) _A	9							µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*									A-T-001

Envirolab Job Number: 24/07857

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07857/2							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	BH16									
Depth to Top	1.10									
Depth To Bottom										
Date Sampled	07-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	6ABE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos Matrix (visual) _o	-									A-T-045
Asbestos Matrix (microscope) _o	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _o	N/A									A-T-045

Envirolab Job Number: 24/07857

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07857/2							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	BH16									
Depth to Top	1.10									
Depth To Bottom										
Date Sampled	07-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	6ABE									
PAH-16MS										
Acenaphthene _A ^{M#}	0.20							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.15							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.75							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	1.95							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	2.00							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	2.36							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.80							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.11							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	2.19							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.40							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	5.25							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.26							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.01							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.30							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	2.85							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	4.32							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	25.2							mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07857

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07857/2							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	BH16									
Depth to Top	1.10									
Depth To Bottom										
Date Sampled	07-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	6ABE									
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02							µg/l	0.02	A-T-019w

Report Notes

General

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- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford, West Yorkshire, UK, WF10 1NJ	Project No:	24/07857
Project:	A635 Barnsley Bus Rapid Transit Route	Date Received:	12/08/2024 (am)
Clients Project No:	765865	Cool Box Temperatures (°C):	19.5-20.0

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07857/2
Client Sample No	102
Client Sample ID/Depth	BH16 1.10m
Date Sampled	07/08/24
A-T-019s	20/08/2024
A-T-019w	16/08/2024
A-T-024s	19/08/2024
A-T-025w	15/08/2024
A-T-040s	16/08/2024
A-T-040w	15/08/2024
A-T-042sFCN	14/08/2024
A-T-042sTCN	14/08/2024
A-T-042wFCN	15/08/2024
A-T-042wTCN	15/08/2024
A-T-044	16/08/2024
A-T-045	14/08/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07858
Issue Number: 1
Date: 20 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Keziah Dalton/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 09/08/24
Date Instructions Received: 12/08/24
Date Analysis Completed: 20/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07858

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5				Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102						
Client Sample ID	WS20	WS20	WS26	WS27						
Depth to Top	0.20	0.70	0.10	1.15						
Depth To Bottom										
Date Sampled	07-Aug-24	07-Aug-24	07-Aug-24	07-Aug-24						
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES						
Sample Matrix Code	4AE	4AE	4AE	4ABE						
% Stones >10mm _A	0.8	<0.1	23.6	20.4				% w/w	0.1	A-T-044
pH _D ^{M#}	8.16	7.80	9.55	8.45				pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	7.80	-	-				pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	0.09	0.05	<0.01				g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	94	-	-				mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	0.05	-	-				% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.02	-	-				% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	<1	<1				mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	<1				mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	8.7	3.4	8.9	11.4				% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	9	9	2	9				mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	0.8	0.6	0.7				mg/kg	0.5	A-T-024s
Copper _D ^{M#}	34	21	20	29				mg/kg	1	A-T-024s
Chromium _D ^{M#}	14	16	125	18				mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1				mg/kg	1	A-T-040s
Lead _D ^{M#}	39	32	46	69				mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17				mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	24	31	24	20				mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	3	<1	<1				mg/kg	1	A-T-024s
Zinc _D ^{M#}	61	71	120	150				mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	-	-	<0.005				mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	-	-	<0.005				mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	-	-	2				µg/l	1	A-T-025w
Cadmium (leachable) _A	-	-	-	<1				µg/l	1	A-T-025w
Copper (leachable) _A	-	-	-	<4				µg/l	4	A-T-025w
Chromium (leachable) _A	-	-	-	<1				µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	-	-	<0.05				mg/l	0.05	A-T-040w
Lead (leachable) _A	-	-	-	<1				µg/l	1	A-T-025w
Mercury (leachable) _A	-	-	-	<0.1				µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	-	-	<2				µg/l	2	A-T-025w
Selenium (leachable) _A	-	-	-	<1				µg/l	1	A-T-025w
Zinc (leachable) _A	-	-	-	4				µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	-	-	*						A-T-001

Envirolab Job Number: 24/07858

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5				Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102						
Client Sample ID	WS20	WS20	WS26	WS27						
Depth to Top	0.20	0.70	0.10	1.15						
Depth To Bottom										
Date Sampled	07-Aug-24	07-Aug-24	07-Aug-24	07-Aug-24						
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES						
Sample Matrix Code	4AE	4AE	4AE	4ABE						
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-	NAD	NAD						A-T-045
Asbestos Matrix (visual) _D	-	-	-	-						A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	N/A	N/A						A-T-045

Envirolab Job Number: 24/07858

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5				Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102						
Client Sample ID	WS20	WS20	WS26	WS27						
Depth to Top	0.20	0.70	0.10	1.15						
Depth To Bottom										
Date Sampled	07-Aug-24	07-Aug-24	07-Aug-24	07-Aug-24						
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES						
Sample Matrix Code	4AE	4AE	4AE	4ABE						
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	0.26	<0.10				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.01	<0.01	<0.10	<0.10				mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	0.93	<0.20				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.16	<0.04	10.6	<0.40				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.16	<0.04	11.2	<0.40				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.25	<0.05	16.2	<0.50				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.08	<0.05	5.75	<0.50				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.09	<0.07	5.99	<0.70				mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.18	<0.06	12.6	<0.60				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	1.50	<0.40				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.19	<0.08	21.2	<0.80				mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	0.20	<0.10				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.08	<0.03	6.38	<0.30				mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.30	<0.30				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.08	<0.03	3.79	<0.30				mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.20	<0.07	20.2	<0.70				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.48	<0.08	117	<0.80				mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07858

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5				Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102						
Client Sample ID	WS20	WS20	WS26	WS27						
Depth to Top	0.20	0.70	0.10	1.15						
Depth To Bottom										
Date Sampled	07-Aug-24	07-Aug-24	07-Aug-24	07-Aug-24						
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES						
Sample Matrix Code	4AE	4AE	4AE	4ABE						
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	-	-	<0.02				µg/l	0.02	A-T-019w

Envirolab Job Number: 24/07858

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5				Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102						
Client Sample ID	WS20	WS20	WS26	WS27						
Depth to Top	0.20	0.70	0.10	1.15						
Depth To Bottom										
Date Sampled	07-Aug-24	07-Aug-24	07-Aug-24	07-Aug-24						
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES						
Sample Matrix Code	4AE	4AE	4AE	4ABE						
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	1	<1	<1	<10				mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<10				mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	1	<1	<1	<10				mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	2	<1	2	<10				mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	8	3	56	473				mg/kg	1	A-T-055s
Ali >C35-C44 _A	2	<1	21	182				mg/kg	1	A-T-055s
Total Aliphatics _A	15	3	79	655				mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1	<10				mg/kg	1	A-T-055s
Aro >C10-C12 _A	1	<1	<1	<10				mg/kg	1	A-T-055s
Aro >C12-C16 _A	7	1	3	<10				mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	9	2	39	17				mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	28	3	161	82				mg/kg	1	A-T-055s
Aro >C35-C44 _A	2	<1	20	155				mg/kg	1	A-T-055s
Total Aromatics _A	47	7	223	254				mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	61	10	302	906				mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford, West Yorkshire, UK, WF10 1NJ	Project No:	24/07858
Project:	A635 Barnsley Bus Rapid Transit Route	Date Received:	12/08/2024 (am)
Clients Project No:	765865	Cool Box Temperatures (°C):	19.5-20.0

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07858/1	24/07858/2	24/07858/3	24/07858/5
Client Sample No	101	102	101	102
Client Sample ID/Depth	WS20 0.20m	WS20 0.70m	WS26 0.10m	WS27 1.15m
Date Sampled	07/08/24	07/08/24	07/08/24	07/08/24
A-T-019s	19/08/2024	19/08/2024	20/08/2024	20/08/2024
A-T-019w				16/08/2024
A-T-022s	15/08/2024	15/08/2024	15/08/2024	15/08/2024
A-T-024s	19/08/2024	19/08/2024	19/08/2024	19/08/2024
A-T-025w				15/08/2024
A-T-026s	16/08/2024	16/08/2024	16/08/2024	16/08/2024
A-T-028s		19/08/2024		
A-T-031s	16/08/2024	16/08/2024	16/08/2024	16/08/2024
A-T-032s	19/08/2024	19/08/2024	19/08/2024	19/08/2024
A-T-040s	16/08/2024	16/08/2024	16/08/2024	16/08/2024
A-T-040w				15/08/2024
A-T-042sFCN	14/08/2024	14/08/2024	14/08/2024	14/08/2024
A-T-042sTCN	14/08/2024	14/08/2024	14/08/2024	14/08/2024
A-T-042wFCN				15/08/2024
A-T-042wTCN				15/08/2024
A-T-044	16/08/2024	16/08/2024	16/08/2024	16/08/2024
A-T-045	14/08/2024		14/08/2024	14/08/2024
A-T-055s	16/08/2024	16/08/2024	16/08/2024	19/08/2024
Calc-As Recd	16/08/2024	16/08/2024	16/08/2024	19/08/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/07863
Issue Number: 1
Date: 19 August, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Keziah Dalton/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 09/08/24
Date Instructions Received: 12/08/24
Date Analysis Completed: 19/08/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/07863

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5			Units	Limit of Detection	Method ref
Client Sample No	101	101	102	101	101					
Client Sample ID	WS03	WS02	WS02	WS04	WS16					
Depth to Top	0.60	0.10	0.40	0.10	0.10					
Depth To Bottom										
Date Sampled	06-Jun-24	06-Jun-24	06-Jun-24	07-Jun-24	07-Jun-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
% Stones >10mm _A	16.2	2.4	4.0	8.2	3.1			% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	-	7.20	-	-			pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	24	-	-			mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	-	<0.02	-	-			% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	0.02	-	-			% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	-	<1	<1			mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	-	<1	<1			mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	8	7	-	9	4			mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.8	0.6	-	0.8	1.0			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	35	32	-	33	47			mg/kg	1	A-T-024s
Chromium _D ^{M#}	24	24	-	32	33			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	-	<1	<1			mg/kg	1	A-T-040s
Lead _D ^{M#}	23	31	-	64	79			mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	-	<0.17	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	51	26	-	24	40			mg/kg	1	A-T-024s
Selenium _D ^{M#}	2	<1	-	<1	2			mg/kg	1	A-T-024s
Zinc _D ^{M#}	85	142	-	274	171			mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005	-	-	-	-			mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005	-	-	-	-			mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	<1	-	-	-	-			µg/l	1	A-T-025w
Cadmium (leachable) _A	<1	-	-	-	-			µg/l	1	A-T-025w
Copper (leachable) _A	<4	-	-	-	-			µg/l	4	A-T-025w
Chromium (leachable) _A	<1	-	-	-	-			µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05	-	-	-	-			mg/l	0.05	A-T-040w
Lead (leachable) _A	<1	-	-	-	-			µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1	-	-	-	-			µg/l	0.1	A-T-025w
Nickel (leachable) _A	13	-	-	-	-			µg/l	2	A-T-025w
Selenium (leachable) _A	<1	-	-	-	-			µg/l	1	A-T-025w
Zinc (leachable) _A	10	-	-	-	-			µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-	-	-	-					A-T-001

Envirolab Job Number: 24/07863

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5			Units	Limit of Detection	Method ref
Client Sample No	101	101	102	101	101					
Client Sample ID	WS03	WS02	WS02	WS04	WS16					
Depth to Top	0.60	0.10	0.40	0.10	0.10					
Depth To Bottom										
Date Sampled	06-Jun-24	06-Jun-24	06-Jun-24	07-Jun-24	07-Jun-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	-	NAD	NAD					A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-					A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	-	N/A	N/A					A-T-045

Envirolab Job Number: 24/07863

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5			Units	Limit of Detection	Method ref
Client Sample No	101	101	102	101	101					
Client Sample ID	WS03	WS02	WS02	WS04	WS16					
Depth to Top	0.60	0.10	0.40	0.10	0.10					
Depth To Bottom										
Date Sampled	06-Jun-24	06-Jun-24	06-Jun-24	07-Jun-24	07-Jun-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	-	0.01	0.03			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	-	<0.01	0.04			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.03	<0.02	-	0.03	0.08			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.12	0.06	-	0.16	0.46			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.13	0.06	-	0.21	0.58			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.16	0.09	-	0.29	0.73			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.11	0.05	-	0.22	0.54			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	-	0.11	0.28			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.14	0.07	-	0.24	0.56			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	-	<0.04	0.09			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.24	0.12	-	0.33	0.77			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	-	<0.01	0.02			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.10	0.04	-	0.16	0.44			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	-	<0.03	0.04			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.16	0.04	-	0.16	0.39			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.22	0.10	-	0.28	0.71			mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.41	0.63	-	2.20	5.76			mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/07863

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5			Units	Limit of Detection	Method ref
Client Sample No	101	101	102	101	101					
Client Sample ID	WS03	WS02	WS02	WS04	WS16					
Depth to Top	0.60	0.10	0.40	0.10	0.10					
Depth To Bottom										
Date Sampled	06-Jun-24	06-Jun-24	06-Jun-24	07-Jun-24	07-Jun-24					
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02	-	-	-	-			µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/07863

Date Received: 12/08/2024 (am)

Cool Box Temperatures (°C): 20.1

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5
Client Sample No	101	101	102	101	101
Client Sample ID/Depth	WS03 0.60m	WS02 0.10m	WS02 0.40m	WS04 0.10m	WS16 0.10m
Date Sampled	06/06/24	06/06/24	06/06/24	07/06/24	07/06/24
Deviation Code					
F	✓	✓	✓	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5
Client Sample No	101	101	102	101	101
Client Sample ID/Depth	WS03 0.60m	WS02 0.10m	WS02 0.40m	WS04 0.10m	WS16 0.10m
Date Sampled	06/06/24	06/06/24	06/06/24	07/06/24	07/06/24
PAH-16MS	✓	✓		✓	✓
Cyanide (free)	✓	✓		✓	✓
Cyanide (total)	✓	✓		✓	✓
Sulphate BRE (water sol 2:1)			✓		
Sulphate BRE (acid sol)			✓		

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/07863/1	24/07863/2	24/07863/3	24/07863/4	24/07863/5
Client Sample No	101	101	102	101	101
Client Sample ID/Depth	WS03 0.60m	WS02 0.10m	WS02 0.40m	WS04 0.10m	WS16 0.10m
Date Sampled	06/06/24	06/06/24	06/06/24	07/06/24	07/06/24
A-T-019s	16/08/2024	16/08/2024		16/08/2024	16/08/2024
A-T-019w	19/08/2024				
A-T-024s	19/08/2024	19/08/2024	19/08/2024	19/08/2024	19/08/2024
A-T-025w	19/08/2024				
A-T-026s			16/08/2024		
A-T-028s			19/08/2024		
A-T-031s			16/08/2024		
A-T-040s	16/08/2024	16/08/2024		16/08/2024	16/08/2024
A-T-040w	16/08/2024				
A-T-042sFCN	14/08/2024	14/08/2024		14/08/2024	14/08/2024
A-T-042sTCN	14/08/2024	14/08/2024		14/08/2024	14/08/2024
A-T-042wFCN	16/08/2024				
A-T-042wTCN	16/08/2024				
A-T-044	16/08/2024	16/08/2024	16/08/2024	16/08/2024	16/08/2024
A-T-045	14/08/2024	14/08/2024		14/08/2024	14/08/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT SUPPLEMENT TO TEST REPORT 24/08094/1

Amendments: Request for Additional Analysis

Envirolab Job Number: 24/08094
Issue Number: 2

Date: 02 October, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 19/08/24
Date Instructions Received: 20/08/24
Date Analysis Completed: 01/10/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/2	24/08094/4	24/08094/5	24/08094/8	24/08094/9	24/08094/10	24/08094/11	Units	Limit of Detection	Method ref
Client Sample No	102	104	101	102	103	101	102			
Client Sample ID	WS08	WS08	WS07	WS22	WS22	BH02	BH02			
Depth to Top	0.60	1.80	0.10	0.40	0.80	0.45	1.10			
Depth To Bottom		2.00								
Date Sampled	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24			
Sample Type	SOIL - ES	SOLID	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	7	5ABE	4ABE	6A	4A	6AE			
% Stones >10mm _A	7.7	<0.1	17.3	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	-	-	-	-	-	7.60	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	-	-	-	-	29	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	-	-	-	-	-	0.03	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	-	-	-	-	0.02	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1 ^U	<1	<1	<1	<1	-	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1 ^U	<1	<1	<1	<1	-	mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	6	5 ^U	6	15	3	7	-	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	<0.5 ^U	<0.5	0.9	0.7	<0.5	-	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	18	14 ^U	31	111	27	21	-	mg/kg	1	A-T-024s
Chromium _D ^{M#}	10	8 ^U	19	13	23	14	-	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	-	mg/kg	1	A-T-040s
Lead _D ^{M#}	243	39 ^U	98	112	21	91	-	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	-	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	7	4 ^U	20	24	36	15	-	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	2 ^U	<1	<1	<1	<1	-	mg/kg	1	A-T-024s
Zinc _D ^{M#}	28	31 ^U	87	278	92	47	-	mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	<0.005	-	<0.005	-	-	-	mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	<0.005	-	<0.005	-	-	-	mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	17	-	5	-	-	-	µg/l	1	A-T-025w
Cadmium (leachable) _A	-	<1	-	<1	-	-	-	µg/l	1	A-T-025w
Copper (leachable) _A	-	<4	-	12	-	-	-	µg/l	4	A-T-025w
Chromium (leachable) _A	-	<1	-	<1	-	-	-	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	<0.05	-	<0.05	-	-	-	mg/l	0.05	A-T-040w
Lead (leachable) _A	-	2	-	<1	-	-	-	µg/l	1	A-T-025w
Mercury (leachable) _A	-	<0.1	-	<0.1	-	-	-	µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	<2	-	<2	-	-	-	µg/l	2	A-T-025w
Selenium (leachable) _A	-	13	-	5	-	-	-	µg/l	1	A-T-025w
Zinc (leachable) _A	-	6	-	10	-	-	-	µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	*	-	*	-	-	-			A-T-001

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/2	24/08094/4	24/08094/5	24/08094/8	24/08094/9	24/08094/10	24/08094/11	Units	Limit of Detection	Method ref
Client Sample No	102	104	101	102	103	101	102			
Client Sample ID	WS08	WS08	WS07	WS22	WS22	BH02	BH02			
Depth to Top	0.60	1.80	0.10	0.40	0.80	0.45	1.10			
Depth To Bottom		2.00								
Date Sampled	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24			
Sample Type	SOIL - ES	SOLID	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	7	5ABE	4ABE	6A	4A	6AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD ^U	NAD	Chrysotile	-	NAD	-			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	Loose Fibres	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	-	N/A	-			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _D	-	-	-	<0.001	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/2	24/08094/4	24/08094/5	24/08094/8	24/08094/9	24/08094/10	24/08094/11	Units	Limit of Detection	Method ref
Client Sample No	102	104	101	102	103	101	102			
Client Sample ID	WS08	WS08	WS07	WS22	WS22	BH02	BH02			
Depth to Top	0.60	1.80	0.10	0.40	0.80	0.45	1.10			
Depth To Bottom		2.00								
Date Sampled	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24			
Sample Type	SOIL - ES	SOLID	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	7	5ABE	4ABE	6A	4A	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	0.02	<0.03 ^U	6.41	0.74	<0.01	0.08	-	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.03	0.06 ^U	0.25	0.19	<0.01	<0.01	-	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.14	0.59 ^U	19	1.59	<0.02	0.10	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.37	1.28 ^U	32	4.78	<0.04	0.19	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.41	0.86 ^U	25.8	3.91	<0.04	0.19	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.53	1.10 ^U	34.4	4.54	<0.05	0.24	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.26	0.34 ^U	14.5	2.49	<0.05	0.11	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.20	0.47 ^U	15.5	1.87	<0.07	0.13	-	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.48	1.32 ^U	42.8	4.40	<0.06	0.22	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.05	0.09 ^U	3.15	0.47	<0.04	<0.04	-	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.62	3.09 ^U	91.5	10.8	<0.08	0.52	-	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.02	0.13 ^U	4.40	0.69	<0.01	0.06	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.25	0.38 ^U	14.8	2.74	<0.03	0.11	-	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.08	0.10 ^U	<0.30	0.19	<0.03	<0.03	-	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.37	0.72 ^U	96.7	6.32	<0.03	0.48	-	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.52	2.41 ^U	81.9	9.50	<0.07	0.43	-	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	4.35	12.9 ^U	483	55.2	<0.08	2.86	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/2	24/08094/4	24/08094/5	24/08094/8	24/08094/9	24/08094/10	24/08094/11	Units	Limit of Detection	Method ref
Client Sample No	102	104	101	102	103	101	102			
Client Sample ID	WS08	WS08	WS07	WS22	WS22	BH02	BH02			
Depth to Top	0.60	1.80	0.10	0.40	0.80	0.45	1.10			
Depth To Bottom		2.00								
Date Sampled	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24			
Sample Type	SOIL - ES	SOLID	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AB	7	5ABE	4ABE	6A	4A	6AE			
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	<0.02	-	0.02	-	-	-	µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	<0.02	-	0.02	-	-	-	µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	<0.02	-	0.05	-	-	-	µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	<0.02	-	<0.02	-	-	-	µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	<0.02	-	0.05	-	-	-	µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	<0.02	-	0.14	-	-	-	µg/l	0.02	A-T-019w

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/08094/14	24/08094/15							
Client Sample No	101	102							
Client Sample ID	WS09	WS09							
Depth to Top	0.15	1.50							
Depth To Bottom		1.70							
Date Sampled	15-Aug-24	15-Aug-24							
Sample Type	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AE	6A							
% Stones >10mm _A	<0.1	<0.1							
Cyanide (free) _A ^{M#}	<1	<1							
Cyanide (total) _A ^{M#}	<1	<1							
Arsenic _D ^{M#}	6	5							
Cadmium _D ^{M#}	0.9	0.6							
Copper _D ^{M#}	28	12							
Chromium _D ^{M#}	38	31							
Chromium (hexavalent) _D	<1	<1							
Lead _D ^{M#}	126	26							
Mercury _D	<0.17	<0.17							
Nickel _D ^{M#}	13	24							
Selenium _D ^{M#}	<1	1							
Zinc _D ^{M#}	469	83							
Cyanide (free) (leachable) _A	<0.005	-							
Cyanide (total) (leachable) _A	0.023	-							
Arsenic (leachable) _A	10	-							
Cadmium (leachable) _A	<1	-							
Copper (leachable) _A	<4	-							
Chromium (leachable) _A	30	-							
Chromium (hexavalent) (leachable) _A	<0.05	-							
Lead (leachable) _A	<1	-							
Mercury (leachable) _A	<0.1	-							
Nickel (leachable) _A	<2	-							
Selenium (leachable) _A	2	-							
Zinc (leachable) _A	6	-							
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-							

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/14	24/08094/15						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	WS09	WS09								
Depth to Top	0.15	1.50								
Depth To Bottom		1.70								
Date Sampled	15-Aug-24	15-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6A								
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	Amosite	-								A-T-045
Asbestos Matrix (visual) ₀	-	-								A-T-045
Asbestos Matrix (microscope) ₀	Loose Fibres	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	-								A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	<0.001	-						% w/w	0.001	A-T-054

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/14	24/08094/15						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	WS09	WS09								
Depth to Top	0.15	1.50								
Depth To Bottom		1.70								
Date Sampled	15-Aug-24	15-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6A								
PAH-16MS										
Acenaphthene _A ^{M#}	0.49	<0.01						mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.45	<0.01						mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	3.24	<0.02						mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	15.3	<0.04						mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	16.3	<0.04						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	19.6	<0.05						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	9.90	<0.05						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	8.68	<0.07						mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	16.9	<0.06						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	2.01	<0.04						mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	26.4	<0.08						mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.36	<0.01						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	10.5	<0.03						mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.30	<0.03						mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	8.33	<0.03						mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	25.2	<0.07						mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	164	<0.08						mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08094

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08094/14	24/08094/15						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	WS09	WS09								
Depth to Top	0.15	1.50								
Depth To Bottom		1.70								
Date Sampled	15-Aug-24	15-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6A								
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	0.02	-						µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	0.02	-						µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/08094

Date Received: 20/08/2024 (am)

Cool Box Temperatures (°C): 15.4 - 16.0

Lab Sample ID	24/08094/10	24/08094/14	24/08094/15
Client Sample No	101	101	102
Client Sample ID/Depth	BH02 0.45m	WS09 0.15m	WS09 1.50-1.70m
Date Sampled	15/08/24	15/08/24	15/08/24
Deviation Code			
F	✓	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	24/08094/10	24/08094/14	24/08094/15
Client Sample No	101	101	102
Client Sample ID/Depth	BH02 0.45m	WS09 0.15m	WS09 1.50-1.70m
Date Sampled	15/08/24	15/08/24	15/08/24
PAH-16MS	✓	✓	✓

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08094/2	24/08094/4	24/08094/5	24/08094/8	24/08094/9	24/08094/10	24/08094/11	24/08094/14	24/08094/15
Client Sample No	102	104	101	102	103	101	102	101	102
Client Sample ID/Depth	WS08 0.60m	WS08 1.80-2.00m	WS07 0.10m	WS22 0.40m	WS22 0.80m	BH02 0.45m	BH02 1.10m	WS09 0.15m	WS09 1.50-1.70m
Date Sampled	15/08/24	15/08/24	15/08/24	15/08/24	15/08/24	15/08/24	15/08/24	15/08/24	15/08/24
A-T-019s	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024	03/09/2024		03/09/2024	03/09/2024
A-T-019w		27/08/2024		27/08/2024				29/08/2024	
A-T-024s	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024	29/08/2024	29/08/2024	29/08/2024	29/08/2024
A-T-025w		28/08/2024		28/08/2024				28/08/2024	
A-T-026s							28/08/2024		
A-T-028s							29/08/2024		
A-T-031s							29/08/2024		
A-T-040s	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	28/08/2024		28/08/2024	28/08/2024
A-T-040w		23/08/2024		23/08/2024				29/08/2024	
A-T-042sFCN	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	28/08/2024		28/08/2024	28/08/2024
A-T-042sTCN	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	28/08/2024		28/08/2024	28/08/2024
A-T-042wFCN		23/08/2024		23/08/2024				28/08/2024	
A-T-042wTCN		23/08/2024		23/08/2024				28/08/2024	
A-T-044	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	29/08/2024	29/08/2024	29/08/2024	29/08/2024
A-T-045	21/08/2024	21/08/2024	21/08/2024	21/08/2024		27/08/2024		27/08/2024	
A-T-054				01/10/2024				01/10/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT SUPPLEMENT TO TEST REPORT 24/08118/1

Amendments: Request for Additional Analysis

Envirolab Job Number: 24/08118
Issue Number: 2

Date: 02 October, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 12/08/24
Date Instructions Received: 20/08/24
Date Analysis Completed: 01/10/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/2	24/08118/3	24/08118/5	24/08118/6	24/08118/7	24/08118/12	24/08118/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	103	104	105	101	101			
Client Sample ID	BH01	BH12	BH15	BH15	BH15	WS15	WS17			
Depth to Top	1.10	2.20	2.10	3.40	4.40	0.10	0.10			
Depth To Bottom										
Date Sampled	13-Aug-24	07-Aug-24	09-Aug-24	09-Aug-24	09-Aug-24	08-Aug-24	12-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6A	6A	6A	6A	4AE	4ABE			
% Stones >10mm _A	14.8	8.2	<0.1	25.1	9.5	41.8	34.2	% w/w	0.1	A-T-044
pH BRE _D ^{M#}	8.32	-	-	8.44	-	-	-	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	11	-	-	33	-	-	-	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	0.05	-	-	0.04	-	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.03	-	-	0.03	-	-	-	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	8	6	13	-	18	3	11	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.5	<0.5	0.9	-	0.7	<0.5	0.7	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	23	20	45	-	24	26	60	mg/kg	1	A-T-024s
Chromium _D ^{M#}	47	14	27	-	25	44	18	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	55	28	121	-	36	38	57	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	-	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	33	26	31	-	35	15	21	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	74	82	190	-	102	95	83	mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005	-	<0.005	-	-	-	<0.005	mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005	-	<0.005	-	-	-	0.009	mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	2	-	4	-	-	-	1	µg/l	1	A-T-025w
Cadmium (leachable) _A	<1	-	<1	-	-	-	<1	µg/l	1	A-T-025w
Copper (leachable) _A	<4	-	5	-	-	-	12	µg/l	4	A-T-025w
Chromium (leachable) _A	4	-	6	-	-	-	<1	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05	-	<0.05	-	-	-	<0.05	mg/l	0.05	A-T-040w
Lead (leachable) _A	<1	-	1	-	-	-	<1	µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1	-	<0.1	-	-	-	<0.1	µg/l	0.1	A-T-025w
Nickel (leachable) _A	<2	-	<2	-	-	-	<2	µg/l	2	A-T-025w
Selenium (leachable) _A	<1	-	2	-	-	-	<1	µg/l	1	A-T-025w
Zinc (leachable) _A	5	-	9	-	-	-	8	µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-	*	-	-	-	*			A-T-001

Envirolab Job Number: 24/08118

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Lab Sample ID	24/08118/2	24/08118/3	24/08118/5	24/08118/6	24/08118/7	24/08118/12	24/08118/13	Units	Limit of Detection	Method ref
Client Sample No	102	104	103	104	105	101	101			
Client Sample ID	BH01	BH12	BH15	BH15	BH15	WS15	WS17			
Depth to Top	1.10	2.20	2.10	3.40	4.40	0.10	0.10			
Depth To Bottom										
Date Sampled	13-Aug-24	07-Aug-24	09-Aug-24	09-Aug-24	09-Aug-24	08-Aug-24	12-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6A	6A	6A	6A	4AE	4ABE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	Chrysotile	-	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	Loose Fibres	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	-	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _D	-	-	<0.001	-	-	-	-	% w/w	0.001	A-T-054

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Client Sample No	102	104	103	104	105	101	101			
Client Sample ID	BH01	BH12	BH15	BH15	BH15	WS15	WS17			
Depth to Top	1.10	2.20	2.10	3.40	4.40	0.10	0.10			
Depth To Bottom										
Date Sampled	13-Aug-24	07-Aug-24	09-Aug-24	09-Aug-24	09-Aug-24	08-Aug-24	12-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6A	6A	6A	6A	4AE	4ABE			
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	0.04	-	0.02	0.01	0.94	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.01	0.02	0.05	-	<0.01	0.02	1.77	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.05	0.04	0.16	-	0.04	0.08	6.90	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.15	0.31	0.21	-	0.07	0.37	17.1	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.14	0.20	0.16	-	0.06	0.48	14	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.17	0.27	0.20	-	0.08	0.58	19.9	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.07	0.07	0.07	-	<0.05	0.39	6.87	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.08	0.12	0.07	-	<0.07	0.21	8.97	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.20	0.34	0.29	-	0.10	0.51	21.3	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	-	<0.04	0.06	1.78	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.33	0.57	0.74	-	0.24	0.65	38.9	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	0.06	-	0.01	0.01	2.26	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.07	0.09	0.07	-	<0.03	0.36	7.71	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	0.05	-	<0.03	<0.03	0.71	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.17	0.10	0.62	-	0.13	0.20	26	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.30	0.54	0.62	-	0.21	0.60	33.4	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	1.74	2.67	3.41	-	0.96	4.53	209	mg/kg	0.01	A-T-019s

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Client Sample No	102	104	103	104	105	101	101			
Client Sample ID	BH01	BH12	BH15	BH15	BH15	WS15	WS17			
Depth to Top	1.10	2.20	2.10	3.40	4.40	0.10	0.10			
Depth To Bottom										
Date Sampled	13-Aug-24	07-Aug-24	09-Aug-24	09-Aug-24	09-Aug-24	08-Aug-24	12-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6A	6A	6A	6A	4AE	4ABE			
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-	<0.02	-	-	-	0.06	µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-	<0.02	-	-	-	0.18	µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-	<0.02	-	-	-	0.02	µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-	0.03	-	-	-	0.07	µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-	<0.02	-	-	-	<0.02	µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-	<0.02	-	-	-	0.02	µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02	-	0.03	-	-	-	0.35	µg/l	0.02	A-T-019w

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Lab Sample ID	24/08118/14	24/08118/17	24/08118/18	24/08118/19	24/08118/20	24/08118/21	24/08118/22	Units	Limit of Detection	Method ref
Client Sample No	102	102	103	101	102	101	102			
Client Sample ID	WS17	WS23	WS23	WS24	WS24	WS19	WS19			
Depth to Top	0.90	0.60	1.00	0.10	0.40	0.10	0.40			
Depth To Bottom										
Date Sampled	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	13-Aug-24	13-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AE	4ABE	6AE	4AE	4AE	4AE	4AE			
% Stones >10mm _A	<0.1	15.5	9.3	<0.1	<0.1	6.2	0.9	% w/w	0.1	A-T-044
pH _D ^{M#}	-	8.90	12.11	-	-	-	-	pH	0.01	A-T-031s
pH BRE _D ^{M#}	8.39	-	-	-	6.70	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.07	<0.01	-	-	-	-	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	270	-	-	-	139	-	-	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	0.10	-	-	-	0.04	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.04	-	-	-	0.03	-	-	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	-	<1	<1	<1	-	<1	<1	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	-	<1	<1	<1	-	<1	<1	mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	-	10.6	19.1	-	-	-	-	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	-	13	8	19	-	11	13	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	-	0.5	0.7	0.6	-	0.7	0.9	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	-	31	24	37	-	34	43	mg/kg	1	A-T-024s
Chromium _D ^{M#}	-	12	14	33	-	30	30	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	-	<1	<1	<1	-	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	-	85	39	39	-	43	35	mg/kg	1	A-T-024s
Mercury _D	-	<0.17	<0.17	<0.17	-	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	-	16	14	32	-	30	35	mg/kg	1	A-T-024s
Selenium _D ^{M#}	-	<1	<1	1	-	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	-	58	44	111	-	83	61	mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	<0.005	-	-	-	<0.005	-	mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	<0.005	-	-	-	<0.005	-	mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	13	-	-	-	<1	-	µg/l	1	A-T-025w
Cadmium (leachable) _A	-	<1	-	-	-	<1	-	µg/l	1	A-T-025w
Copper (leachable) _A	-	39	-	-	-	<4	-	µg/l	4	A-T-025w
Chromium (leachable) _A	-	2	-	-	-	<1	-	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	<0.05	-	-	-	<0.05	-	mg/l	0.05	A-T-040w
Lead (leachable) _A	-	<1	-	-	-	<1	-	µg/l	1	A-T-025w
Mercury (leachable) _A	-	<0.1	-	-	-	<0.1	-	µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	7	-	-	-	<2	-	µg/l	2	A-T-025w
Selenium (leachable) _A	-	3	-	-	-	<1	-	µg/l	1	A-T-025w
Zinc (leachable) _A	-	4	-	-	-	14	-	µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	*	-	-	-	*	-			A-T-001

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Lab Sample ID	24/08118/14	24/08118/17	24/08118/18	24/08118/19	24/08118/20	24/08118/21	24/08118/22	Units	Limit of Detection	Method ref
Client Sample No	102	102	103	101	102	101	102			
Client Sample ID	WS17	WS23	WS23	WS24	WS24	WS19	WS19			
Depth to Top	0.90	0.60	1.00	0.10	0.40	0.10	0.40			
Depth To Bottom										
Date Sampled	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	13-Aug-24	13-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AE	4ABE	6AE	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	-	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	-	N/A	N/A			A-T-045

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Client Sample No	102	102	103	101	102	101	102			
Client Sample ID	WS17	WS23	WS23	WS24	WS24	WS19	WS19			
Depth to Top	0.90	0.60	1.00	0.10	0.40	0.10	0.40			
Depth To Bottom										
Date Sampled	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	13-Aug-24	13-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AE	4ABE	6AE	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene _A ^{M#}	-	<0.01	<0.05	<0.01	-	0.08	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	<0.01	<0.04	<0.04	-	0.02	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	<0.02	<0.02	0.12	-	0.19	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	<0.04	<0.04	0.74	-	0.45	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	<0.04	<0.04	0.65	-	0.45	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	0.05	<0.05	0.72	-	0.51	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	<0.05	<0.05	0.26	-	0.25	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	<0.07	<0.07	0.30	-	0.21	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	<0.06	<0.06	0.76	-	0.58	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	<0.04	<0.04	0.07	-	0.05	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	<0.08	<0.08	1.03	-	1.08	<0.08	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	<0.01	<0.02	<0.02	-	0.05	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	<0.03	<0.03	0.27	-	0.26	<0.03	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	0.12	<0.21	<0.04	-	0.04	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	0.06	0.19	0.21	-	0.68	<0.03	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	<0.07	<0.07	0.97	-	0.95	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	-	0.23	0.19	6.10	-	5.85	<0.08	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/14	24/08118/17	24/08118/18	24/08118/19	24/08118/20	24/08118/21	24/08118/22	Units	Limit of Detection	Method ref
Client Sample No	102	102	103	101	102	101	102			
Client Sample ID	WS17	WS23	WS23	WS24	WS24	WS19	WS19			
Depth to Top	0.90	0.60	1.00	0.10	0.40	0.10	0.40			
Depth To Bottom										
Date Sampled	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	13-Aug-24	13-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AE	4ABE	6AE	4AE	4AE	4AE	4AE			
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	<0.02	-	-	-	<0.02	-	µg/l	0.02	A-T-019w

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/14	24/08118/17	24/08118/18	24/08118/19	24/08118/20	24/08118/21	24/08118/22	Units	Limit of Detection	Method ref
Client Sample No	102	102	103	101	102	101	102			
Client Sample ID	WS17	WS23	WS23	WS24	WS24	WS19	WS19			
Depth to Top	0.90	0.60	1.00	0.10	0.40	0.10	0.40			
Depth To Bottom										
Date Sampled	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	12-Aug-24	13-Aug-24	13-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AE	4ABE	6AE	4AE	4AE	4AE	4AE			
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	-	<0.10	0.01	-	-	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	3	93	-	-	-	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	2	317	-	-	-	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	3	593	-	-	-	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	2	172	-	-	-	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	-	4	37	-	-	-	-	mg/kg	1	A-T-055s
Ali >C35-C44 _A	-	<1	<10	-	-	-	-	mg/kg	1	A-T-055s
Total Aliphatics _A	-	15	1210	-	-	-	-	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	5	302	-	-	-	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A	-	4	104	-	-	-	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	8	189	-	-	-	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	4	44	-	-	-	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	6	19	-	-	-	-	mg/kg	1	A-T-055s
Aro >C35-C44 _A	-	<1	<10	-	-	-	-	mg/kg	1	A-T-055s
Total Aromatics _A	-	28	659	-	-	-	-	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	-	43	1870	-	-	-	-	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	<0.10	<0.01	-	-	-	-	mg/kg	0.01	A-T-022s

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Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	Units	Limit of Detection	Method ref
Client Sample No	103	101	101	102	101	102	102			
Client Sample ID	WS19	WS33	WS34	WS34	WS31	WS31	WS30			
Depth to Top	1.60	0.10	0.10	1.40	0.10	0.60	0.30			
Depth To Bottom	1.80			1.50						
Date Sampled	13-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6	4AE	4AE	6A	4AE	6AE	4AE			
% Stones >10mm _A	<0.1	4.8	3.3	<0.1	4.4	<0.1	12.3	% w/w	0.1	A-T-044
pH _D ^{M#}	-	-	-	-	7.66	-	7.83	pH	0.01	A-T-031s
pH BRE _D ^{M#}	7.79	-	-	7.95	-	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	-	-	0.11	-	0.04	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	274	-	-	33	-	-	-	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	0.07	-	-	0.04	-	-	-	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.02	-	-	0.02	-	-	-	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	-	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	-	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	-	-	-	-	45.0	-	35.1	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	-	13	18	6	30	4	32	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	-	0.7	0.7	0.8	1.1	0.7	0.7	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	-	59	67	28	199	19	95	mg/kg	1	A-T-024s
Chromium _D ^{M#}	-	45	22	26	35	29	18	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	-	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	-	59	65	29	110	20	57	mg/kg	1	A-T-024s
Mercury _D	-	<0.17	<0.17	<0.17	0.18	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	-	24	25	34	37	27	34	mg/kg	1	A-T-024s
Selenium _D ^{M#}	-	<1	<1	2	2	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	-	116	116	91	103	86	61	mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	-	<0.005	-	<0.005	-	-	mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	-	<0.005	-	<0.005	-	-	mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	-	1	-	<1	-	-	µg/l	1	A-T-025w
Cadmium (leachable) _A	-	-	<1	-	<1	-	-	µg/l	1	A-T-025w
Copper (leachable) _A	-	-	22	-	4	-	-	µg/l	4	A-T-025w
Chromium (leachable) _A	-	-	<1	-	<1	-	-	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	-	<0.05	-	<0.05	-	-	mg/l	0.05	A-T-040w
Lead (leachable) _A	-	-	1	-	<1	-	-	µg/l	1	A-T-025w
Mercury (leachable) _A	-	-	<0.1	-	<0.1	-	-	µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	-	<2	-	<2	-	-	µg/l	2	A-T-025w
Selenium (leachable) _A	-	-	<1	-	1	-	-	µg/l	1	A-T-025w
Zinc (leachable) _A	-	-	8	-	10	-	-	µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	-	*	-	*	-	-			A-T-001

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	Units	Limit of Detection	Method ref
Client Sample No	103	101	101	102	101	102	102			
Client Sample ID	WS19	WS33	WS34	WS34	WS31	WS31	WS30			
Depth to Top	1.60	0.10	0.10	1.40	0.10	0.60	0.30			
Depth To Bottom	1.80			1.50						
Date Sampled	13-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6	4AE	4AE	6A	4AE	6AE	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	-	NAD	NAD	-	NAD	-	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	-	N/A	N/A	-	N/A	-	N/A			A-T-045

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Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	Units	Limit of Detection	Method ref
Client Sample No	103	101	101	102	101	102	102			
Client Sample ID	WS19	WS33	WS34	WS34	WS31	WS31	WS30			
Depth to Top	1.60	0.10	0.10	1.40	0.10	0.60	0.30			
Depth To Bottom	1.80			1.50						
Date Sampled	13-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6	4AE	4AE	6A	4AE	6AE	4AE			
PAH-16MS										
Acenaphthene _A ^{M#}	-	0.17	0.14	<0.01	0.36	<0.01	0.08	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	0.04	0.03	<0.01	0.08	<0.01	0.03	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	0.33	0.36	<0.02	1.14	<0.02	0.23	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	1.03	0.97	<0.04	4.87	<0.04	0.98	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	1.00	0.85	<0.04	5.52	<0.04	1.11	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	1.18	1.13	<0.05	6.42	<0.05	1.52	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.49	0.53	<0.05	3.66	<0.05	0.61	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	0.46	0.44	<0.07	2.45	<0.07	0.58	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	1.26	1.18	<0.06	4.49	<0.06	1.12	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	0.10	0.09	<0.04	0.89	<0.04	0.17	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	2.50	2.73	<0.08	6.43	<0.08	1.41	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	0.13	0.11	<0.01	0.26	<0.01	0.05	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	0.53	0.56	<0.03	4.00	<0.03	0.66	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	0.11	0.04	<0.03	0.75	<0.03	0.29	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	1.60	1.85	<0.03	4.13	<0.03	0.97	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	2.10	2.18	<0.07	5.48	<0.07	1.22	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	-	13	13.2	<0.08	50.9	<0.08	11	mg/kg	0.01	A-T-019s

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Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	Units	Limit of Detection	Method ref
Client Sample No	103	101	101	102	101	102	102			
Client Sample ID	WS19	WS33	WS34	WS34	WS31	WS31	WS30			
Depth to Top	1.60	0.10	0.10	1.40	0.10	0.60	0.30			
Depth To Bottom	1.80			1.50						
Date Sampled	13-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6	4AE	4AE	6A	4AE	6AE	4AE			
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	-	<0.02	-	<0.02	-	-	µg/l	0.02	A-T-019w

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Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	Units	Limit of Detection	Method ref
Client Sample No	103	101	101	102	101	102	102			
Client Sample ID	WS19	WS33	WS34	WS34	WS31	WS31	WS30			
Depth to Top	1.60	0.10	0.10	1.40	0.10	0.60	0.30			
Depth To Bottom	1.80			1.50						
Date Sampled	13-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6	4AE	4AE	6A	4AE	6AE	4AE			
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	-	-	-	-	0.03	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	-	-	-	20	-	11	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	-	-	-	11	-	6	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	-	-	-	18	-	11	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	-	-	-	19	-	10	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	-	-	-	-	67	-	22	mg/kg	1	A-T-055s
Ali >C35-C44 _A	-	-	-	-	26	-	6	mg/kg	1	A-T-055s
Total Aliphatics _A	-	-	-	-	162	-	65	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	-	-	-	0.02	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	-	-	-	16	-	8	mg/kg	1	A-T-055s
Aro >C10-C12 _A	-	-	-	-	15	-	8	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	-	-	-	49	-	25	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	-	-	-	58	-	29	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	-	-	-	161	-	59	mg/kg	1	A-T-055s
Aro >C35-C44 _A	-	-	-	-	23	-	6	mg/kg	1	A-T-055s
Total Aromatics _A	-	-	-	-	321	-	135	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	-	-	-	-	483	-	200	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	-	-	-	0.02	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	-	-	-	0.02	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	-	-	-	<0.01	-	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/34							Units	Limit of Detection	Method ref
Client Sample No	101									
Client Sample ID	WS10									
Depth to Top	0.10									
Depth To Bottom										
Date Sampled	14-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
% Stones >10mm _A	16.4							% w/w	0.1	A-T-044
Cyanide (free) _A ^{M#}	<1							mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	11							mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.7							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	39							mg/kg	1	A-T-024s
Chromium _D ^{M#}	29							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	81							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	14							mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1							mg/kg	1	A-T-024s
Zinc _D ^{M#}	134							mg/kg	5	A-T-024s

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/08118/34							Units	Limit of Detection	Method ref
Client Sample No	101									
Client Sample ID	WS10									
Depth to Top	0.10									
Depth To Bottom										
Date Sampled	14-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos Matrix (visual) _D	-									A-T-045
Asbestos Matrix (microscope) _D	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 24/08118

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08118/34							Units	Limit of Detection	Method ref
Client Sample No	101									
Client Sample ID	WS10									
Depth to Top	0.10									
Depth To Bottom										
Date Sampled	14-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
PAH-16MS										
Acenaphthene _A ^{M#}	0.71							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.13							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	3.48							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	10.2							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	9.55							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	12.1							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	4.94							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	4.77							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	14.9							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	1.01							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	27.6							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.52							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	5.33							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.30							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	11.9							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	26.6							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	134							mg/kg	0.01	A-T-019s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/08118

Date Received: 20/08/2024 (am)

Cool Box Temperatures (°C): 23.0 & 24.3

Lab Sample ID	24/08118/13
Client Sample No	101
Client Sample ID/Depth	WS17 0.10m
Date Sampled	12/08/24
Deviation Code	
D (no glass)	✓

Key
D (no glass) Glass container not provided for extractable organics analysis

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08118/2	24/08118/3	24/08118/5	24/08118/6	24/08118/7	24/08118/12	24/08118/13	24/08118/14	24/08118/17	24/08118/18	24/08118/19	24/08118/20
Client Sample No	102	104	103	104	105	101	101	102	102	103	101	102
Client Sample ID/Depth	BH01 1.10m	BH12 2.20m	BH15 2.10m	BH15 3.40m	BH15 4.40m	WS15 0.10m	WS17 0.10m	WS17 0.90m	WS23 0.60m	WS23 1.00m	WS24 0.10m	WS24 0.40m
Date Sampled	13/08/24	07/08/24	09/08/24	09/08/24	09/08/24	08/08/24	12/08/24	12/08/24	12/08/24	12/08/24	12/08/24	12/08/24
A-T-019s	23/08/2024	23/08/2024	23/08/2024		23/08/2024	23/08/2024	23/08/2024		23/08/2024	23/08/2024	23/08/2024	
A-T-019w	27/08/2024		27/08/2024				27/08/2024		27/08/2024			
A-T-022s									27/08/2024	23/08/2024		
A-T-024s	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024
A-T-025w	28/08/2024		28/08/2024				28/08/2024		28/08/2024			
A-T-026s	27/08/2024			27/08/2024				27/08/2024	27/08/2024	27/08/2024		27/08/2024
A-T-028s	27/08/2024			27/08/2024				27/08/2024				27/08/2024
A-T-031s	27/08/2024			27/08/2024				27/08/2024	27/08/2024	27/08/2024		27/08/2024
A-T-032s									28/08/2024	28/08/2024		
A-T-040s	27/08/2024	27/08/2024	27/08/2024		27/08/2024	27/08/2024	27/08/2024		27/08/2024	27/08/2024	27/08/2024	
A-T-040w	23/08/2024		23/08/2024				23/08/2024		23/08/2024			
A-T-042sFCN	22/08/2024	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024	
A-T-042sTCN	22/08/2024	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024	
A-T-042wFCN	23/08/2024		23/08/2024				28/08/2024		23/08/2024			
A-T-042wTCN	23/08/2024		23/08/2024				23/08/2024		23/08/2024			
A-T-044	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024
A-T-045	22/08/2024	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	
A-T-054			01/10/2024									
A-T-055s									22/08/2024	22/08/2024		
Calc-As Recd									27/08/2024	23/08/2024		

Lab Sample ID	24/08118/21	24/08118/22	24/08118/23	24/08118/24	24/08118/26	24/08118/27	24/08118/28	24/08118/29	24/08118/31	24/08118/34
Client Sample No	101	102	103	101	101	102	101	102	102	101
Client Sample ID/Depth	WS19 0.10m	WS19 0.40m	WS19 1.60-1.80m	WS33 0.10m	WS34 0.10m	WS34 1.40-1.50m	WS31 0.10m	WS31 0.60m	WS30 0.30m	WS10 0.10m
Date Sampled	13/08/24	13/08/24	13/08/24	13/08/24	13/08/24	13/08/24	14/08/24	14/08/24	14/08/24	14/08/24
A-T-019s	23/08/2024	23/08/2024		23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024	23/08/2024
A-T-019w	27/08/2024				27/08/2024		27/08/2024			
A-T-022s							23/08/2024		23/08/2024	
A-T-024s	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024
A-T-025w	27/08/2024				27/08/2024		27/08/2024			
A-T-026s			27/08/2024			27/08/2024	27/08/2024		27/08/2024	
A-T-028s			27/08/2024			27/08/2024				
A-T-031s			27/08/2024			27/08/2024	27/08/2024		27/08/2024	
A-T-032s							28/08/2024		28/08/2024	
A-T-040s	27/08/2024	27/08/2024		27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024	27/08/2024
A-T-040w	23/08/2024				23/08/2024		23/08/2024			
A-T-042sFCN	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
A-T-042sTCN	22/08/2024	22/08/2024		22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024
A-T-042wFCN	23/08/2024				23/08/2024		23/08/2024			
A-T-042wTCN	23/08/2024				23/08/2024		23/08/2024			
A-T-044	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024	28/08/2024
A-T-045	22/08/2024	22/08/2024		22/08/2024	22/08/2024		22/08/2024		22/08/2024	22/08/2024
A-T-054										
A-T-055s							22/08/2024		28/08/2024	
Calc-As Recd							23/08/2024		28/08/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/08193
Issue Number: 1

Date: 03 September, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 21/08/24
Date Instructions Received: 22/08/24
Date Analysis Completed: 03/09/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	Units	Limit of Detection	Method ref
Client Sample No	102	105	101	101	104	105	106			
Client Sample ID	WS05	WS05	WS21	WS04B	WS06	WS06	WS06			
Depth to Top	0.40	1.90	0.10	0.15	0.80	1.90	2.70			
Depth To Bottom		2.00					2.90			
Date Sampled	16-Aug-24	16-Aug-24	16-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4ABE	6AE	4AE	1AE	4A	6A	3A			
% Stones >10mm _A	31.2	6.6	38.0	<0.1	4.0	<0.1	<0.1	% w/w	0.1	A-T-044
pH _D ^{M#}	-	6.74	11.12	-	8.29	-	-	pH	0.01	A-T-031s
pH BRE _D ^{M#}	-	-	11.12	-	-	-	6.90	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.50	0.02	-	0.06	-	-	g/l	0.01	A-T-026s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	-	22	-	-	-	106	mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	-	0.07	-	-	-	0.04	% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	-	0.07	-	-	-	0.02	% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	<1	<1	<1	<1	-	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	1	-	mg/kg	1	A-T-042sTCN
Organic Matter _D ^{M#}	-	24.6	10.5	-	12.3	-	-	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	6	58	<1	13	5	18	-	mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	1.5	<0.5	0.6	<0.5	0.6	-	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	14	236	14	33	42	151	-	mg/kg	1	A-T-024s
Chromium _D ^{M#}	12	62	326	24	26	24	-	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	-	mg/kg	1	A-T-040s
Lead _D ^{M#}	36	167	16	76	45	72	-	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	-	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	14	83	12	23	13	24	-	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	2	1	1	3	<1	-	mg/kg	1	A-T-024s
Zinc _D ^{M#}	59	390	30	94	82	131	-	mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	-	-	-	-	<0.005	-	-	mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	-	-	-	-	<0.005	-	-	mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	-	-	-	-	2	-	-	µg/l	1	A-T-025w
Cadmium (leachable) _A	-	-	-	-	<1	-	-	µg/l	1	A-T-025w
Copper (leachable) _A	-	-	-	-	5	-	-	µg/l	4	A-T-025w
Chromium (leachable) _A	-	-	-	-	<1	-	-	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	-	-	-	-	<0.05	-	-	mg/l	0.05	A-T-040w
Lead (leachable) _A	-	-	-	-	<1	-	-	µg/l	1	A-T-025w
Mercury (leachable) _A	-	-	-	-	<0.1	-	-	µg/l	0.1	A-T-025w
Nickel (leachable) _A	-	-	-	-	<2	-	-	µg/l	2	A-T-025w
Selenium (leachable) _A	-	-	-	-	2	-	-	µg/l	1	A-T-025w
Zinc (leachable) _A	-	-	-	-	6	-	-	µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	-	-	-	-	*	-	-			A-T-001

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	Units	Limit of Detection	Method ref
Client Sample No	102	105	101	101	104	105	106			
Client Sample ID	WS05	WS05	WS21	WS04B	WS06	WS06	WS06			
Depth to Top	0.40	1.90	0.10	0.15	0.80	1.90	2.70			
Depth To Bottom		2.00					2.90			
Date Sampled	16-Aug-24	16-Aug-24	16-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4ABE	6AE	4AE	1AE	4A	6A	3A			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	-	NAD	NAD	NAD	-			A-T-045
Asbestos Matrix (visual) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	-	N/A	N/A	N/A	-			A-T-045

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	Units	Limit of Detection	Method ref
Client Sample No	102	105	101	101	104	105	106			
Client Sample ID	WS05	WS05	WS21	WS04B	WS06	WS06	WS06			
Depth to Top	0.40	1.90	0.10	0.15	0.80	1.90	2.70			
Depth To Bottom		2.00					2.90			
Date Sampled	16-Aug-24	16-Aug-24	16-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4ABE	6AE	4AE	1AE	4A	6A	3A			
PAH-16MS										
Acenaphthene _A ^{MS}	<0.01	0.11	4.39	0.01	6.53	0.10	-	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	<0.01	0.07	0.28	<0.01	4.04	0.06	-	mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	<0.02	0.36	2.49	0.03	27.6	0.21	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	<0.04	1.63	4.46	0.25	27.9	0.76	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	0.05	1.72	5.24	0.30	24.3	0.89	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	<0.05	2.32	5.29	0.37	31.6	1.03	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	<0.05	0.93	4.15	0.19	13.4	0.68	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	<0.07	0.95	2.40	0.13	13.5	0.38	-	mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	<0.06	1.71	5.31	0.30	34.4	0.84	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	<0.04	0.23	0.91	<0.04	2.97	0.12	-	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	<0.08	4.65	18.1	0.53	81.1	1.40	-	mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	<0.01	0.16	1.72	<0.01	18.3	0.09	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	0.05	1.17	4.27	0.18	13.5	0.65	-	mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	<0.03	0.07	<0.30	<0.03	24.2	0.16	-	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	0.04 ^U	1.04 ^U	15.2 ^U	0.20	127	0.63	-	mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	<0.07	3.54	15	0.45	64.4	1.24	-	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	0.14	20.7	89.2	2.94	515	9.24	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	Units	Limit of Detection	Method ref
Client Sample No	102	105	101	101	104	105	106			
Client Sample ID	WS05	WS05	WS21	WS04B	WS06	WS06	WS06			
Depth to Top	0.40	1.90	0.10	0.15	0.80	1.90	2.70			
Depth To Bottom		2.00					2.90			
Date Sampled	16-Aug-24	16-Aug-24	16-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4ABE	6AE	4AE	1AE	4A	6A	3A			
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	-	-	-	-	1.17	-	-	µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	-	-	-	-	0.15	-	-	µg/l	0.02	A-T-019w
Anthracene (leachable) _A	-	-	-	-	0.50	-	-	µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	-	-	-	-	0.06	-	-	µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	-	-	-	-	0.07	-	-	µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	-	-	-	-	0.08	-	-	µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	-	-	-	-	0.05	-	-	µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	-	-	-	-	0.04	-	-	µg/l	0.02	A-T-019w
Chrysene (leachable) _A	-	-	-	-	0.07	-	-	µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	-	-	-	-	<0.02	-	-	µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	-	-	-	-	0.17	-	-	µg/l	0.02	A-T-019w
Fluorene (leachable) _A	-	-	-	-	0.34	-	-	µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	-	-	-	-	0.04	-	-	µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	-	-	-	-	0.04	-	-	µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	-	-	-	-	0.19	-	-	µg/l	0.02	A-T-019w
Pyrene (leachable) _A	-	-	-	-	0.14	-	-	µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	-	-	-	-	3.11	-	-	µg/l	0.02	A-T-019w

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	Units	Limit of Detection	Method ref
Client Sample No	102	105	101	101	104	105	106			
Client Sample ID	WS05	WS05	WS21	WS04B	WS06	WS06	WS06			
Depth to Top	0.40	1.90	0.10	0.15	0.80	1.90	2.70			
Depth To Bottom		2.00					2.90			
Date Sampled	16-Aug-24	16-Aug-24	16-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24	19-Aug-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4ABE	6AE	4AE	1AE	4A	6A	3A			
TPH UKCWG with Clean Up										
Ali >C5-C6 _A	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	-	0.02	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	-	2	<20	-	<20	-	-	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	-	<1	<20	-	<20	-	-	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	-	4	<20	-	<20	-	-	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	-	16	34	-	<20	-	-	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	-	81	417	-	97	-	-	mg/kg	1	A-T-055s
Ali >C35-C44 _A	-	36	314	-	56	-	-	mg/kg	1	A-T-055s
Total Aliphatics _A	-	138	777	-	152	-	-	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	-	4	<20	-	<20	-	-	mg/kg	1	A-T-055s
Aro >C10-C12 _A	-	4	<20	-	52	-	-	mg/kg	1	A-T-055s
Aro >C12-C16 _A	-	13	56	-	266	-	-	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	-	43	237	-	787	-	-	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	-	151	675	-	1540	-	-	mg/kg	1	A-T-055s
Aro >C35-C44 _A	-	16	213	-	61	-	-	mg/kg	1	A-T-055s
Total Aromatics _A	-	230	1180	-	2700	-	-	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44) _A	-	368	1960	-	2850	-	-	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s
MTBE _A [#]	-	<0.01	<0.01	-	<0.01	-	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/08193/20									
Client Sample No	102									
Client Sample ID	WS11									
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	19-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	1AE									
% Stones >10mm _A	<0.1							% w/w	0.1	A-T-044
Cyanide (free) _A ^{M#}	<1							mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	11							mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.7							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	36							mg/kg	1	A-T-024s
Chromium _D ^{M#}	72							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	75							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	26							mg/kg	1	A-T-024s
Selenium _D ^{M#}	1							mg/kg	1	A-T-024s
Zinc _D ^{M#}	119							mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005							mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005							mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	<1							µg/l	1	A-T-025w
Cadmium (leachable) _A	<1							µg/l	1	A-T-025w
Copper (leachable) _A	8							µg/l	4	A-T-025w
Chromium (leachable) _A	1							µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05							mg/l	0.05	A-T-040w
Lead (leachable) _A	2							µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1							µg/l	0.1	A-T-025w
Nickel (leachable) _A	<2							µg/l	2	A-T-025w
Selenium (leachable) _A	<1							µg/l	1	A-T-025w
Zinc (leachable) _A	8							µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*									A-T-001

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08193/20							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	WS11									
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	19-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	1AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos Matrix (visual) ₀	-									A-T-045
Asbestos Matrix (microscope) ₀	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A									A-T-045

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/08193/20							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	WS11									
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	19-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	1AE									
PAH-16MS										
Acenaphthene _A ^{MS}	0.18							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	0.02							mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	0.34							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	0.85							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	0.74							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	0.80							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	0.40							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	0.25							mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	0.78							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	0.07							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	1.52							mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	0.10							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	0.29							mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	0.09							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	1.16							mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	1.46							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	9.05							mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08193

Client Project Name: A635 Barnsley Bus Rapid Transit
Route

Client Project Ref: 765865

Lab Sample ID	24/08193/20							Units	Limit of Detection	Method ref
Client Sample No	102									
Client Sample ID	WS11									
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	19-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	1AE									
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	0.02							µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02							µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	0.02							µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "D" on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript "A"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.

Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route

Clients Project No: 765865

Project No: 24/08193

Date Received: 22/08/2024 (am)

Cool Box Temperatures (°C): 16.7, 17.1, 16.8, 16.0,
17.5

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08193/2	24/08193/5	24/08193/8	24/08193/9	24/08193/13	24/08193/15	24/08193/17	24/08193/20
Client Sample No	102	105	101	101	104	105	106	102
Client Sample ID/Depth	WS05 0.40m	WS05 1.90-2.00m	WS21 0.10m	WS04B 0.15m	WS06 0.80m	WS06 1.90m	WS06 2.70-2.90m	WS11 0.20m
Date Sampled	16/08/24	16/08/24	16/08/24	19/08/24	19/08/24	19/08/24	19/08/24	19/08/24
A-T-019s	27/08/2024	27/08/2024	27/08/2024	30/08/2024	30/08/2024	30/08/2024		30/08/2024
A-T-019w					02/09/2024			02/09/2024
A-T-022s		28/08/2024	28/08/2024		30/08/2024			
A-T-024s	29/08/2024	29/08/2024	29/08/2024	02/09/2024	02/09/2024	02/09/2024	02/09/2024	02/09/2024
A-T-025w					03/09/2024			03/09/2024
A-T-026s		29/08/2024	29/08/2024		02/09/2024		02/09/2024	
A-T-028s			29/08/2024				02/09/2024	
A-T-031s		29/08/2024	29/08/2024		30/08/2024		30/08/2024	
A-T-032s		29/08/2024	29/08/2024		30/08/2024			
A-T-040s	29/08/2024	29/08/2024	29/08/2024	02/09/2024	02/09/2024	02/09/2024		02/09/2024
A-T-040w					02/09/2024			02/09/2024
A-T-042sFCN	28/08/2024	28/08/2024	28/08/2024	30/08/2024	30/08/2024	03/09/2024		30/08/2024
A-T-042sTCN	28/08/2024	28/08/2024	28/08/2024	30/08/2024	30/08/2024	30/08/2024		30/08/2024
A-T-042wFCN					02/09/2024			02/09/2024
A-T-042wTCN					02/09/2024			02/09/2024
A-T-044	29/08/2024	29/08/2024	29/08/2024	03/09/2024	03/09/2024	03/09/2024	03/09/2024	03/09/2024
A-T-045	27/08/2024	27/08/2024		29/08/2024	29/08/2024	29/08/2024		29/08/2024
A-T-055s		27/08/2024	27/08/2024		30/08/2024			
Calc-As Recd		28/08/2024	28/08/2024		30/08/2024			

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/08266
Issue Number: 1

Date: 03 September, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 21/08/24
Date Instructions Received: 27/08/24
Date Analysis Completed: 03/09/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/08266

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08266/1	24/08266/4	24/08266/5					Units	Limit of Detection	Method ref
Client Sample No	103	106	107							
Client Sample ID	BH16	BH16	BH16							
Depth to Top	1.90	3.60	4.40							
Depth To Bottom										
Date Sampled	20-Aug-24	20-Aug-24	20-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	6A	6A	6							
% Stones >10mm _A	25.9	<0.1	<0.1					% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	6.66	6.61					pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	191	74					mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	0.14	0.03					% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.32	0.02					% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1	-					mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	-					mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	4	64	-					mg/kg	1	A-T-024s
Cadmium _D ^{M#}	0.6	1.0	-					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	28	95	-					mg/kg	1	A-T-024s
Chromium _D ^{M#}	22	26	-					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	-					mg/kg	1	A-T-040s
Lead _D ^{M#}	21	124	-					mg/kg	1	A-T-024s
Mercury _D	<0.17	0.18	-					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	39	41	-					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	2	-					mg/kg	1	A-T-024s
Zinc _D ^{M#}	78	137	-					mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005	-	-					mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	<0.005	-	-					mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	<1	-	-					µg/l	1	A-T-025w
Cadmium (leachable) _A	<1	-	-					µg/l	1	A-T-025w
Copper (leachable) _A	<4	-	-					µg/l	4	A-T-025w
Chromium (leachable) _A	<1	-	-					µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05	-	-					mg/l	0.05	A-T-040w
Lead (leachable) _A	<1	-	-					µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1	-	-					µg/l	0.1	A-T-025w
Nickel (leachable) _A	3	-	-					µg/l	2	A-T-025w
Selenium (leachable) _A	<1	-	-					µg/l	1	A-T-025w
Zinc (leachable) _A	17	-	-					µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-	-							A-T-001

Envirolab Job Number: 24/08266

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08266/1	24/08266/4	24/08266/5					Units	Limit of Detection	Method ref
Client Sample No	103	106	107							
Client Sample ID	BH16	BH16	BH16							
Depth to Top	1.90	3.60	4.40							
Depth To Bottom										
Date Sampled	20-Aug-24	20-Aug-24	20-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	6A	6A	6							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	-							A-T-045
Asbestos Matrix (visual) _D	-	-	-							A-T-045
Asbestos Matrix (microscope) _D	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	-							A-T-045

Envirolab Job Number: 24/08266

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08266/1	24/08266/4	24/08266/5					Units	Limit of Detection	Method ref
Client Sample No	103	106	107							
Client Sample ID	BH16	BH16	BH16							
Depth to Top	1.90	3.60	4.40							
Depth To Bottom										
Date Sampled	20-Aug-24	20-Aug-24	20-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	6A	6A	6							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	0.02	-					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.03	-					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	0.16	-					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	0.37	-					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	0.23	-					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	0.34	-					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	0.14	-					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	0.14	-					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	0.36	-					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	-					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	0.83	-					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	0.03	-					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	0.16	-					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	0.08	-					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	0.45	-					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	0.64	-					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	3.98	-					mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08266

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08266/1	24/08266/4	24/08266/5					Units	Limit of Detection	Method ref
Client Sample No	103	106	107							
Client Sample ID	BH16	BH16	BH16							
Depth to Top	1.90	3.60	4.40							
Depth To Bottom										
Date Sampled	20-Aug-24	20-Aug-24	20-Aug-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	6A	6A	6							
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02	-	-					µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/08266

Date Received: 27/08/2024 (am)

Cool Box Temperatures (°C): 16.7

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08266/1	24/08266/4	24/08266/5
Client Sample No	103	106	107
Client Sample ID/Depth	BH16 1.90m	BH16 3.60m	BH16 4.40m
Date Sampled	20/08/24	20/08/24	20/08/24
A-T-019s	29/08/2024	29/08/2024	
A-T-019w	02/09/2024		
A-T-024s	02/09/2024	02/09/2024	02/09/2024
A-T-025w	03/09/2024		
A-T-026s		30/08/2024	30/08/2024
A-T-028s		02/09/2024	02/09/2024
A-T-031s		30/08/2024	30/08/2024
A-T-040s	30/08/2024	30/08/2024	
A-T-040w	02/09/2024		
A-T-042sFCN	28/08/2024	28/08/2024	
A-T-042sTCN	28/08/2024	28/08/2024	
A-T-042wFCN	02/09/2024		
A-T-042wTCN	02/09/2024		
A-T-044	03/09/2024	03/09/2024	03/09/2024
A-T-045	29/08/2024	29/08/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/08267
Issue Number: 1

Date: 03 September, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 21/08/24
Date Instructions Received: 27/08/24
Date Analysis Completed: 03/09/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/08267

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08267/1	24/08267/2						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	BH07	BH07								
Depth to Top	0.10	1.00								
Depth To Bottom										
Date Sampled	19-Aug-24	19-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6AE								
% Stones >10mm _A	<0.1	<0.1						% w/w	0.1	A-T-044
pH BRE _D ^{M#}	-	7.09						pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	-	104						mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	-	0.06						% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	-	0.03						% w/w	0.01	A-T-024s
Cyanide (free) _A ^{M#}	<1	<1						mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	8	<1						mg/kg	1	A-T-042sTCN
Arsenic _D ^{M#}	35	5						mg/kg	1	A-T-024s
Cadmium _D ^{M#}	2.6	1.1						mg/kg	0.5	A-T-024s
Copper _D ^{M#}	334	41						mg/kg	1	A-T-024s
Chromium _D ^{M#}	52	29						mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1						mg/kg	1	A-T-040s
Lead _D ^{M#}	307	28						mg/kg	1	A-T-024s
Mercury _D	1.56	<0.17						mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	62	35						mg/kg	1	A-T-024s
Selenium _D ^{M#}	2	2						mg/kg	1	A-T-024s
Zinc _D ^{M#}	385	111						mg/kg	5	A-T-024s
Cyanide (free) (leachable) _A	<0.005	-						mg/l	0.005	A-T-042wFCN
Cyanide (total) (leachable) _A	0.021	-						mg/l	0.005	A-T-042wTCN
Arsenic (leachable) _A	1	-						µg/l	1	A-T-025w
Cadmium (leachable) _A	<1	-						µg/l	1	A-T-025w
Copper (leachable) _A	22	-						µg/l	4	A-T-025w
Chromium (leachable) _A	<1	-						µg/l	1	A-T-025w
Chromium (hexavalent) (leachable) _A	<0.05	-						mg/l	0.05	A-T-040w
Lead (leachable) _A	<1	-						µg/l	1	A-T-025w
Mercury (leachable) _A	<0.1	-						µg/l	0.1	A-T-025w
Nickel (leachable) _A	<2	-						µg/l	2	A-T-025w
Selenium (leachable) _A	<1	-						µg/l	1	A-T-025w
Zinc (leachable) _A	14	-						µg/l	2	A-T-025w
Leachate Prep BS EN 12457-1 (2:1) (1 no.) _A	*	-								A-T-001

Envirolab Job Number: 24/08267

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08267/1	24/08267/2						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	BH07	BH07								
Depth to Top	0.10	1.00								
Depth To Bottom										
Date Sampled	19-Aug-24	19-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6AE								
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	-								A-T-045
Asbestos Matrix (visual) _D	-	-								A-T-045
Asbestos Matrix (microscope) _D	-	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-								A-T-045

Envirolab Job Number: 24/08267

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08267/1	24/08267/2						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	BH07	BH07								
Depth to Top	0.10	1.00								
Depth To Bottom										
Date Sampled	19-Aug-24	19-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6AE								
PAH-16MS										
Acenaphthene _A ^{M#}	0.44	<0.01						mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.63	<0.01						mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	1.94	0.04						mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	8.22	0.13						mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	8.95	0.09						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	11.6	0.10						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	6.16	<0.05						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	4.21	<0.07						mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	8.20	0.10						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	1.39	<0.04						mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	16.5	0.29						mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.45	<0.01						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	6.11	0.05						mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	1.13	<0.03						mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	7.34	0.13						mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	14.7	0.23						mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	98	1.16						mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/08267

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08267/1	24/08267/2						Units	Limit of Detection	Method ref
Client Sample No	101	102								
Client Sample ID	BH07	BH07								
Depth to Top	0.10	1.00								
Depth To Bottom										
Date Sampled	19-Aug-24	19-Aug-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	4AE	6AE								
PAH 16MS (leachable)										
Acenaphthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Acenaphthylene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(a)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(b)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(ghi)perylene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Benzo(k)fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Chrysene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Dibenzo(ah)anthracene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluoranthene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Fluorene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Indeno(123-cd)pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Naphthalene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Phenanthrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Pyrene (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w
Total PAH 16MS (leachable) _A	<0.02	-						µg/l	0.02	A-T-019w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford, West Yorkshire, UK, WF10 1NJ	Project No:	24/08267
Project:	A635 Barnsley Bus Rapid Transit Route	Date Received:	27/08/2024 (am)
Clients Project No:	765865	Cool Box Temperatures (°C):	16.7

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08267/1	24/08267/2
Client Sample No	101	102
Client Sample ID/Depth	BH07 0.10m	BH07 1.00m
Date Sampled	19/08/24	19/08/24
A-T-019s	29/08/2024	29/08/2024
A-T-019w	02/09/2024	
A-T-024s	02/09/2024	02/09/2024
A-T-025w	03/09/2024	
A-T-026s		30/08/2024
A-T-028s		02/09/2024
A-T-031s		30/08/2024
A-T-040s	30/08/2024	30/08/2024
A-T-040w	02/09/2024	
A-T-042sFCN	28/08/2024	28/08/2024
A-T-042sTCN	28/08/2024	28/08/2024
A-T-042wFCN	03/09/2024	
A-T-042wTCN	02/09/2024	
A-T-044	03/09/2024	03/09/2024
A-T-045	28/08/2024	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/08281
Issue Number: 1

Date: 03 September, 2024

Client: Structural Soils Limited (Castleford)
The Potteries
Pottery Street
Castleford
West Yorkshire
UK
WF10 1NJ

Project Manager: Alex Jones/Tim Clifford
Project Name: A635 Barnsley Bus Rapid Transit Route
Project Ref: 765865
Order No: N/A
Date Samples Received: 23/08/24
Date Instructions Received: 27/08/24
Date Analysis Completed: 03/09/24

Approved by:



Richard Wong
Client Manager

Certificate of Accreditation



Envirolab Ltd

Testing Laboratory No. 1247

**Is accredited in accordance with International Standard ISO/IEC 17025:2017
– General Requirements for the competence of testing and calibration
laboratories.**

This accreditation demonstrates technical competence for a defined scope specified in the schedule to this certificate, and the operation of a management system (refer joint ISO-ILAC-IAF Communiqué dated April 2017). The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued.

The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from www.ukas.com.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements.

A handwritten signature in blue ink, reading "Matt Gantley", is positioned above a horizontal line.

Matt Gantley, *Chief Executive Officer*
United Kingdom Accreditation Service

Initial Accreditation: 2 December 1992
Certificate Issued: 25 January 2021



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Envirolab Job Number: 24/08281

Client Project Name: A635 Barnsley Bus Rapid Transit Route

Client Project Ref: 765865

Lab Sample ID	24/08281/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH01									
Depth to Top	2.10									
Depth To Bottom										
Date Sampled	21-Aug-24									
Sample Type	SOIL - ES									
Sample Matrix Code	5A									
% Stones >10mm _A	<0.1							% w/w	0.1	A-T-044
pH BRE _D ^{M#}	6.92							pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	17							mg/l	10	A-T-026s
Sulphate BRE (acid sol) _D ^{M#}	<0.02							% w/w	0.02	A-T-028s
Sulphur BRE (total) _D	0.03							% w/w	0.01	A-T-024s

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Assigned Matrix Codes

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5	SAND/CLAY			E	Contains roots / twigs

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EPH CWG results have humics mathematically subtracted through instrument calculation.

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Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Castleford), The Potteries, Pottery Street, Castleford,
West Yorkshire, UK, WF10 1NJ

Project: A635 Barnsley Bus Rapid Transit Route
Clients Project No: 765865

Project No: 24/08281

Date Received: 27/08/2024 (am)

Cool Box Temperatures (°C): 17.4

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/08281/1
Client Sample No	
Client Sample ID/Depth	BH01 2.10m
Date Sampled	21/08/24
A-T-024s	30/08/2024
A-T-026s	29/08/2024
A-T-028s	29/08/2024
A-T-031s	29/08/2024
A-T-044	03/09/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Certificate of Accreditation



Envirolab Ltd

Testing Laboratory No. 1247

**Is accredited in accordance with International Standard ISO/IEC 17025:2017
– General Requirements for the competence of testing and calibration
laboratories.**

This accreditation demonstrates technical competence for a defined scope specified in the schedule to this certificate, and the operation of a management system (refer joint ISO-ILAC-IAF Communiqué dated April 2017). The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued.

The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from www.ukas.com.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements.

A handwritten signature in blue ink, reading "Matt Gantley", is positioned above a horizontal line.

Matt Gantley, *Chief Executive Officer*
United Kingdom Accreditation Service

Initial Accreditation: 2 December 1992
Certificate Issued: 25 January 2021



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APPENDIX F - MONITORING RECORDS

(i) Groundwater Monitoring Results

IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
BH01	1	50	2 / 1	4.00	NDA	1.00 to 4.50	09/09/2021 11:10	---	General Remarks: Access not granted by security - spoke to Tim Clifford but Sainsburys need to inform security that we are going on site in advance.
BH01	1	50	3 / 1	4.00	0.00	1.00 to 4.50	17/09/2024 10:33	0.00	
BH01	1	50	5 / 1	4.00	NDA	1.00 to 4.50	01/10/2024 11:27	---	General Remarks: No access.
BH01	1	50	6 / 1	4.00	NDA	1.00 to 4.50	07/10/2024 11:11	---	General Remarks: No access.
BH01	1	50	7 / 1	4.00	NDA	1.00 to 4.50	14/10/2024	---	General Remarks: No access.
BH01	1	50	8 / 1	4.00	NDA	1.00 to 4.50	21/10/2024	---	General Remarks: No access.
BH01	1	50	9 / 1	4.00	NDA	1.00 to 4.50	28/10/2024 11:37	---	General Remarks: No access.
BH01	1	50	10 / 1	4.00	NDA	1.00 to 4.50	07/11/2024 09:01	---	General Remarks: No access.
BH01	1	50	11 / 1	4.00	NDA	1.00 to 4.50	11/11/2024 11:09	---	General Remarks: No access.
BH01	1	50	12 / 1	4.00	NDA	1.00 to 4.50	22/11/2024	---	General Remarks: No access.
BH01	1	50	13 / 1	4.00	NDA	1.00 to 4.50	29/11/2024 11:01	---	General Remarks: No access.
BH03	1	50	2 / 1	8.50	NDA	5.00 to 8.50	09/09/2021 11:12	---	General Remarks: Access not granted by security - spoke to Tim Clifford but Sainsburys need to inform security that we are going on site in advance.
BH03	1	50	3 / 1	8.50	0.00	5.00 to 8.50	17/09/2024 10:32	0.00	
BH03	1	50	5 / 1	8.50	NDA	5.00 to 8.50	01/10/2024 11:27	---	General Remarks: No access.
BH03	1	50	6 / 1	8.50	NDA	5.00 to 8.50	07/10/2024 11:12	---	General Remarks: No access.
BH03	1	50	7 / 1	8.50	NDA	5.00 to 8.50	14/10/2024	---	General Remarks: No access.
BH03	1	50	8 / 1	8.50	NDA	5.00 to 8.50	21/10/2024	---	General Remarks: No access.
BH03	1	50	9 / 1	8.50	NDA	5.00 to 8.50	28/10/2024	---	General Remarks: No access.
BH03	1	50	10 / 1	8.50	NDA	5.00 to 8.50	07/11/2024 09:01	---	General Remarks: No access.
BH03	1	50	11 / 1	8.50	NDA	5.00 to 8.50	11/11/2024 11:09	---	General Remarks: No access.
BH03	1	50	12 / 1	8.50	NDA	5.00 to 8.50	22/11/2024	---	General Remarks: No access.
BH03	1	50	13 / 1	8.50	NDA	5.00 to 8.50	29/11/2024 11:01	---	General Remarks: No access.

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref:
	Maria Galan	MG	12/12/2024	765865
	Contract: A635 Barnsley Bus RapidTransit Route			Page 1 of 8 

IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
BH06	1	50	2 / 1	4.00	3.96	1.00 to 4.00	09/09/2024 10:16	DRY	
BH06	1	50	3 / 1	4.00	3.95	1.00 to 4.00	16/09/2024 11:14	3.95	
BH06	1	50	4 / 1	4.00	3.95	1.00 to 4.00	26/09/2024 09:16	3.93	
BH06	1	50	5 / 1	4.00	3.94	1.00 to 4.00	01/10/2024 10:03	3.51	
BH06	1	50	6 / 1	4.00	3.94	1.00 to 4.00	07/10/2024 10:13	3.38	
BH06	1	50	7 / 1	4.00	3.95	1.00 to 4.00	14/10/2024 09:14	3.26	
BH06	1	50	8 / 1	4.00	4.02	1.00 to 4.00	21/10/2024 10:08	3.11	
BH06	1	50	9 / 1	4.00	3.95	1.00 to 4.00	28/10/2024 10:32	3.49	
BH06	1	50	10 / 1	4.00	3.96	1.00 to 4.00	07/11/2024 08:13	3.61	
BH06	1	50	11 / 1	4.00	3.96	1.00 to 4.00	11/11/2024 10:19	3.71	
BH06	1	50	12 / 1	4.00	3.97	1.00 to 4.00	22/11/2024 09:10	3.65	
BH06	1	50	13 / 1	4.00	3.98	1.00 to 4.00	29/11/2024 09:53	3.31	
BH07	1	50	3 / 1	10.00	7.34	1.00 to 10.00	16/09/2024 10:07	7.27	
BH07	1	50	4 / 1	10.00	7.31	1.00 to 10.00	26/09/2024 09:51	7.28	
BH07	1	50	5 / 1	10.00	7.31	1.00 to 10.00	01/10/2024 10:42	DRY	
BH07	1	50	6 / 1	10.00	7.31	1.00 to 10.00	07/10/2024 10:39	DRY	
BH07	1	50	7 / 1	10.00	7.34	1.00 to 10.00	14/10/2024 10:03	DRY	
BH07	1	50	8 / 1	10.00	7.34	1.00 to 10.00	21/10/2024 10:28	DRY	
BH07	1	50	9 / 1	10.00	2.82	1.00 to 10.00	28/10/2024 10:52	2.77	
BH07	1	50	10 / 1	10.00	7.33	1.00 to 10.00	07/11/2024 08:31	7.29	
BH07	1	50	11 / 1	10.00	7.28	1.00 to 10.00	11/11/2024 10:38	7.25	
BH07	1	50	12 / 1	10.00	7.27	1.00 to 10.00	22/11/2024 09:34	7.22	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
	Maria Galan	MG	12/12/2024	
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IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
BH07	1	50	13 / 1	10.00	7.27	1.00 to 10.00	29/11/2024 10:12	7.22	
BH08	1	50	2 / 1	15.00	14.87	7.00 to 15.00	09/09/2024 10:11	9.92	
BH08	1	50	3 / 1	15.00	14.76	7.00 to 15.00	17/09/2024 08:55	9.83	
BH08	1	50	4 / 1	15.00	14.87	7.00 to 15.00	26/09/2024 09:11	9.45	
BH08	1	50	5 / 1	15.00	14.86	7.00 to 15.00	01/10/2024 09:57	9.36	
BH08	1	50	6 / 1	15.00	14.85	7.00 to 15.00	07/10/2024 10:09	9.18	
BH08	1	50	7 / 1	15.00	14.85	7.00 to 15.00	14/10/2024 09:10	9.23	
BH08	1	50	8 / 1	15.00	14.87	7.00 to 15.00	21/10/2024 10:07	9.23	
BH08	1	50	9 / 1	15.00	14.87	7.00 to 15.00	28/10/2024 10:28	9.22	
BH08	1	50	10 / 1	15.00	14.87	7.00 to 15.00	07/11/2024 08:08	9.35	
BH08	1	50	11 / 1	15.00	14.87	7.00 to 15.00	11/11/2024 10:17	9.43	
BH08	1	50	12 / 1	15.00	14.87	7.00 to 15.00	22/11/2024 09:09	9.34	
BH08	1	50	13 / 1	15.00	14.87	7.00 to 15.00	29/11/2024 09:50	9.21	
BH11	1	50	2 / 1	15.00	14.92	9.00 to 15.00	09/09/2024 10:39	13.17	
BH11	1	50	3 / 1	15.00	14.89	9.00 to 15.00	17/09/2024 09:39	14.27	
BH11	1	50	4 / 1	15.00	14.93	9.00 to 15.00	26/09/2024 09:21	13.13	
BH11	1	50	5 / 1	15.00	14.90	9.00 to 15.00	01/10/2024 10:09	13.24	
BH11	1	50	6 / 1	15.00	14.89	9.00 to 15.00	07/10/2024 10:17	12.96	
BH11	1	50	7 / 1	15.00	14.88	9.00 to 15.00	14/10/2024 09:20	13.08	
BH11	1	50	8 / 1	15.00	14.89	9.00 to 15.00	21/10/2024 10:15	13.03	
BH11	1	50	9 / 1	15.00	14.94	9.00 to 15.00	28/10/2024 10:35	12.96	
BH11	1	50	10 / 1	15.00	14.94	9.00 to 15.00	07/11/2024 08:15	13.09	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
BH11	1	50	11 / 1	15.00	14.94	9.00 to 15.00	11/11/2024 10:23	13.10	
BH11	1	50	12 / 1	15.00	14.96	9.00 to 15.00	22/11/2024 09:15	12.84	
BH11	1	50	13 / 1	15.00	14.94	9.00 to 15.00	29/11/2024 09:57	12.62	
BH12	1	50	3 / 1	6.00	5.97	2.90 to 6.10	16/09/2024 09:11	4.78	
BH12	1	50	4 / 1	6.00	5.96	2.90 to 6.10	26/09/2024 09:42	2.89	
BH12	1	50	5 / 1	6.00	5.96	2.90 to 6.10	01/10/2024 10:31	2.90	
BH12	1	50	6 / 1	6.00	5.98	2.90 to 6.10	07/10/2024 10:32	2.92	
BH12	1	50	7 / 1	6.00	5.98	2.90 to 6.10	14/10/2024 09:49	2.91	
BH12	1	50	8 / 1	6.00	5.95	2.90 to 6.10	21/10/2024 10:35	2.91	
BH12	1	50	9 / 1	6.00	5.97	2.90 to 6.10	28/10/2024 11:00	2.91	
BH12	1	50	10 / 1	6.00	5.93	2.90 to 6.10	07/11/2024 08:41	3.05	
BH12	1	50	11 / 1	6.00	5.97	2.90 to 6.10	11/11/2024 10:47	3.20	
BH12	1	50	12 / 1	6.00	5.95	2.90 to 6.10	22/11/2024 09:41	2.89	
BH12	1	50	13 / 1	6.00	5.97	2.90 to 6.10	29/11/2024 10:22	2.90	
BH13	1	50	2 / 1	3.00	2.53	1.50 to 3.00	16/09/2024 09:45	1.09	
BH13	1	50	4 / 1	3.00	2.92	1.50 to 3.00	26/09/2024 09:45	1.02	
BH13	1	50	5 / 1	3.00	2.89	1.50 to 3.00	01/10/2024 10:36	0.66	
BH13	1	50	6 / 1	3.00	2.86	1.50 to 3.00	07/10/2024 10:34	0.86	
BH13	1	50	7 / 1	3.00	2.86	1.50 to 3.00	14/10/2024 09:53	0.81	
BH13	1	50	8 / 1	3.00	2.89	1.50 to 3.00	21/10/2024 10:33	0.79	
BH13	1	50	9 / 1	3.00	2.88	1.50 to 3.00	28/10/2024 10:57	1.34	
BH13	1	50	10 / 1	3.00	2.86	1.50 to 3.00	07/11/2024 08:37	1.85	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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	Contract: A635 Barnsley Bus RapidTransit Route			Page 4 of 8 

IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
BH13	1	50	11 / 1	3.00	2.87	1.50 to 3.00	11/11/2024 10:44	2.11	
BH13	1	50	12 / 1	3.00	2.85	1.50 to 3.00	22/11/2024 09:40	1.74	
BH13	1	50	13 / 1	3.00	2.87	1.50 to 3.00	29/11/2024 10:19	1.36	
BH14	1	NDA	2 / 1	NDA	2.49	NDA to NDA	09/09/2024 09:45	1.87	
BH16	1	50	2 / 1	7.50	8.56	2.00 to 7.50	09/09/2024 09:35	3.15	
BH16	1	50	3 / 1	7.50	8.57	2.00 to 7.50	17/09/2024 10:40	3.10	
BH16	1	50	4 / 1	7.50	8.61	2.00 to 7.50	26/09/2024 10:16	3.09	
BH16	1	50	5 / 1	7.50	8.57	2.00 to 7.50	01/10/2024 11:11	2.88	
BH16	1	50	6 / 1	7.50	8.54	2.00 to 7.50	07/10/2024 11:01	2.88	
BH16	1	50	7 / 1	7.50	8.54	2.00 to 7.50	14/10/2024 10:39	2.88	
BH16	1	50	8 / 1	7.50	8.68	2.00 to 7.50	21/10/2024 10:53	2.94	
BH16	1	50	9 / 1	7.50	8.63	2.00 to 7.50	28/10/2024 11:37	2.99	
BH16	1	50	10 / 1	7.50	8.55	2.00 to 7.50	07/11/2024 08:59	3.06	
BH16	1	50	11 / 1	7.50	8.59	2.00 to 7.50	11/11/2024 11:04	3.08	
BH16	1	50	12 / 1	7.50	8.55	2.00 to 7.50	22/11/2024 10:04	3.09	
BH16	1	50	13 / 1	7.50	8.59	2.00 to 7.50	29/11/2024 10:52	2.94	
WS06	1	50	2 / 1	3.60	3.76	1.00 to 3.60	09/09/2024 09:09	1.88	
WS06	1	50	3 / 1	3.60	3.81	1.00 to 3.60	17/09/2024 10:14	1.95	
WS06	1	50	4 / 1	3.60	3.83	1.00 to 3.60	26/09/2024 10:06	1.92	
WS06	1	50	5 / 1	3.60	3.76	1.00 to 3.60	01/10/2024 11:02	1.83	
WS06	1	50	6 / 1	3.60	3.76	1.00 to 3.60	07/10/2024 10:53	1.84	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
WS06	1	50	7 / 1	3.60	3.76	1.00 to 3.60	14/10/2024 10:23	1.85	
WS06	1	50	8 / 1	3.60	3.82	1.00 to 3.60	21/10/2024 10:51	1.93	
WS06	1	50	9 / 1	3.60	3.83	1.00 to 3.60	28/10/2024 11:26	1.93	
WS06	1	50	10 / 1	3.60	3.83	1.00 to 3.60	07/11/2024 08:52	1.93	
WS06	1	50	11 / 1	3.60	3.75	1.00 to 3.60	11/11/2024 10:57	1.83	
WS06	1	50	12 / 1	3.60	3.77	1.00 to 3.60	22/11/2024 09:55	1.84	
WS06	1	50	13 / 1	3.60	3.75	1.00 to 3.60	29/11/2024 10:42	1.83	
WS17	1	50	3 / 1	3.70	3.69	1.00 to 3.70	16/09/2024 10:21	3.40	
WS17	1	50	4 / 1	3.70	3.69	1.00 to 3.70	26/09/2024 09:54	3.23	
WS17	1	50	5 / 1	3.70	3.68	1.00 to 3.70	01/10/2024 10:43	2.00	
WS17	1	50	6 / 1	3.70	3.68	1.00 to 3.70	07/10/2024 10:41	3.22	
WS17	1	50	7 / 1	3.70	3.67	1.00 to 3.70	14/10/2024 10:07	3.35	
WS17	1	50	8 / 1	3.70	3.55	1.00 to 3.70	21/10/2024 10:31	3.19	
WS17	1	50	9 / 1	3.70	3.69	1.00 to 3.70	28/10/2024 10:53	3.34	
WS17	1	50	10 / 1	3.70	3.70	1.00 to 3.70	07/11/2024 08:34	3.42	
WS17	1	50	11 / 1	3.70	3.69	1.00 to 3.70	11/11/2024 10:39	3.43	
WS17	1	50	12 / 1	3.70	3.70	1.00 to 3.70	22/11/2024 09:35	3.34	
WS17	1	50	13 / 1	3.70	3.67	1.00 to 3.70	29/11/2024 10:14	3.39	
WS19	1	50	2 / 1	5.00	5.02	2.00 to 5.00	09/09/2024 10:23	4.58	
WS19	1	50	3 / 1	5.00	5.05	2.00 to 5.00	16/09/2024 10:36	4.75	
WS19	1	50	4 / 1	5.00	5.03	2.00 to 5.00	26/09/2024 09:33	4.56	
WS19	1	50	5 / 1	5.00	5.00	2.00 to 5.00	01/10/2024 10:20	4.58	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
WS19	1	50	6 / 1	5.00	5.01	2.00 to 5.00	07/10/2024 10:23	4.53	
WS19	1	50	7 / 1	5.00	5.00	2.00 to 5.00	14/10/2024 09:32	4.44	
WS19	1	50	8 / 1	5.00	5.04	2.00 to 5.00	21/10/2024 10:20	4.44	
WS19	1	50	9 / 1	5.00	5.01	2.00 to 5.00	28/10/2024 10:41	4.46	
WS19	1	50	10 / 1	5.00	5.03	2.00 to 5.00	07/11/2024 08:20	4.55	
WS19	1	50	11 / 1	5.00	5.03	2.00 to 5.00	11/11/2024 10:29	4.55	
WS19	1	50	12 / 1	5.00	5.04	2.00 to 5.00	22/11/2024 09:25	4.37	
WS19	1	50	13 / 1	5.00	5.03	2.00 to 5.00	29/11/2024 10:05	4.40	
WS20	1	50	9 / 1	2.00	2.04	1.00 to 2.00	28/10/2024 10:39	DRY	
WS20	1	50	2 / 1	2.00	2.08	1.00 to 2.00	09/09/2024 10:47	DRY	
WS20	1	50	4 / 1	2.00	2.04	1.00 to 2.00	26/09/2024 09:27	DRY	
WS20	1	50	5 / 1	2.00	2.04	1.00 to 2.00	01/10/2024 10:14	DRY	
WS20	1	50	6 / 1	2.00	2.04	1.00 to 2.00	07/10/2024 10:21	DRY	
WS20	1	50	7 / 1	2.00	2.04	1.00 to 2.00	14/10/2024 09:25	DRY	
WS20	1	50	8 / 1	2.00	2.04	1.00 to 2.00	21/10/2024 10:17	DRY	
WS20	1	50	10 / 1	2.00	1.96	1.00 to 2.00	07/11/2024 08:19	---	
WS20	1	50	11 / 1	2.00	2.04	1.00 to 2.00	11/11/2024 10:27	DRY	
WS20	1	50	12 / 1	2.00	2.04	1.00 to 2.00	22/11/2024 09:19	DRY	
WS20	1	50	13 / 1	2.00	2.04	1.00 to 2.00	29/11/2024 10:01	DRY	
WS31	1	50	2 / 1	3.00	3.05	1.00 to 3.00	09/09/2024 11:03	3.00	
WS31	1	50	3 / 1	3.00	3.05	1.00 to 3.00	16/09/2024 11:23	3.03	
WS31	1	50	4 / 1	3.00	3.04	1.00 to 3.00	26/09/2024 10:21	2.98	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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IN-SITU WATER MONITORING RESULTS

Exploratory Position ID	Pipe Ref	Pipe Diameter (mm)	Monitoring Round / Test Number	Reported Installation Depth (mbgl)	Measured Installation Depth (mbgl)	Response Zone (m)	Date & Time of Monitoring	Water Depth (mbgl)	Remarks
WS31	1	50	5 / 1	3.00	3.05	1.00 to 3.00	01/10/2024 11:25	2.96	
WS31	1	50	6 / 1	3.00	3.03	1.00 to 3.00	07/10/2024 11:09	2.95	
WS31	1	50	7 / 1	3.00	3.03	1.00 to 3.00	14/10/2024 10:49	2.98	
WS31	1	50	8 / 1	3.00	3.05	1.00 to 3.00	21/10/2024 10:44	2.99	
WS31	1	50	9 / 1	3.00	3.03	1.00 to 3.00	28/10/2024 11:10	2.96	
WS31	1	50	10 / 1	3.00	3.03	1.00 to 3.00	07/11/2024 08:48	3.00	
WS31	1	50	11 / 1	3.00	3.05	1.00 to 3.00	11/11/2024 10:54	3.03	
WS31	1	50	12 / 1	3.00	3.05	1.00 to 3.00	22/11/2024 09:49	3.01	
WS31	1	50	13 / 1	3.00	3.05	1.00 to 3.00	29/11/2024 10:32	3.01	
WS33	1	50	2 / 1	3.50	3.35	1.00 to 3.50	09/09/2024 10:29	3.32	
WS33	1	50	3 / 1	3.50	3.46	1.00 to 3.50	16/09/2024 10:51	3.41	
WS33	1	50	4 / 1	3.50	3.48	1.00 to 3.50	26/09/2024 09:37	3.40	
WS33	1	50	5 / 1	3.50	3.47	1.00 to 3.50	01/10/2024 10:25	1.52	
WS33	1	50	6 / 1	3.50	3.47	1.00 to 3.50	07/10/2024 10:27	2.44	
WS33	1	50	7 / 1	3.50	3.47	1.00 to 3.50	14/10/2024 09:37	2.51	
WS33	1	50	8 / 1	3.50	3.40	1.00 to 3.50	21/10/2024 10:23	2.83	
WS33	1	50	9 / 1	3.50	3.49	1.00 to 3.50	28/10/2024 10:47	2.95	
WS33	1	50	10 / 1	3.50	3.48	1.00 to 3.50	07/11/2024 08:24	3.10	
WS33	1	50	11 / 1	3.50	3.50	1.00 to 3.50	11/11/2024 10:33	3.15	
WS33	1	50	12 / 1	3.50	3.50	1.00 to 3.50	22/11/2024 09:29	3.16	
WS33	1	50	13 / 1	3.50	3.50	1.00 to 3.50	29/11/2024 10:08	3.14	

Key: NDA denotes 'no data available'.

 STRUCTURAL SOILS The Potteries Pottery Street Castleford W. Yorkshire WF10 1NJ	Checked By		Date	Contract Ref: 765865
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APPENDIX G - CALIBRATION CERTIFICATES AND PERMIT

- (i) SPT Calibration Records

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AR1862
Test Date: 15/02/2024
Report Date: 15/02/2024
File Name: AR1862.spt
Test Operator: CM

Instrumented Rod Data

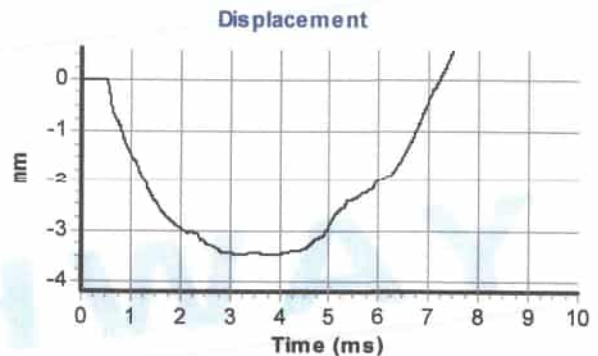
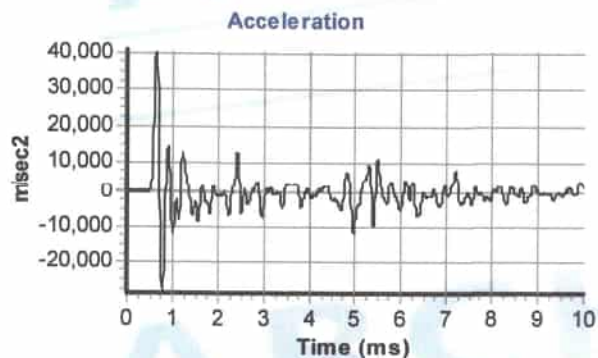
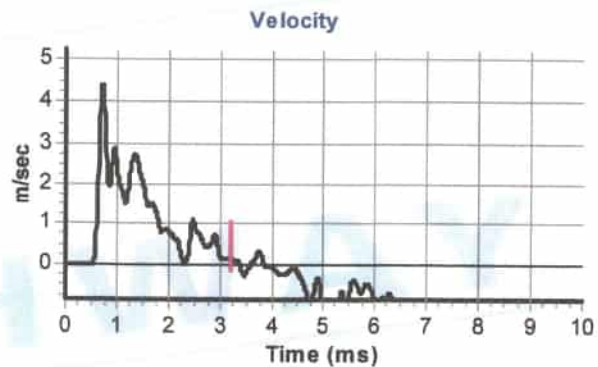
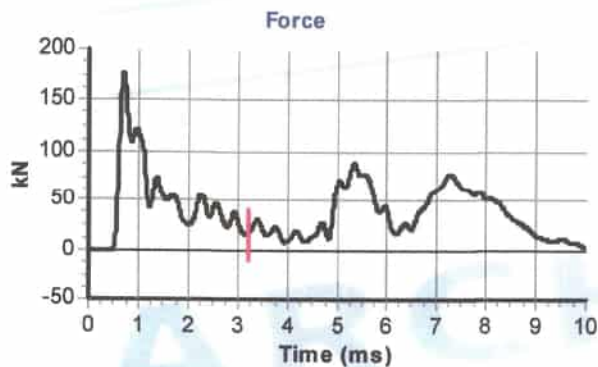
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

STRUCTURAL SOILS - 88325



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 331

Energy Ratio E_r (%): **70**

Signed: C.McCLUSKEY
Title: FITTER

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AR3874
Test Date: 22/07/2024
Report Date: 24/07/2024
File Name: AR3874.spt
Test Operator: IW

Instrumented Rod Data

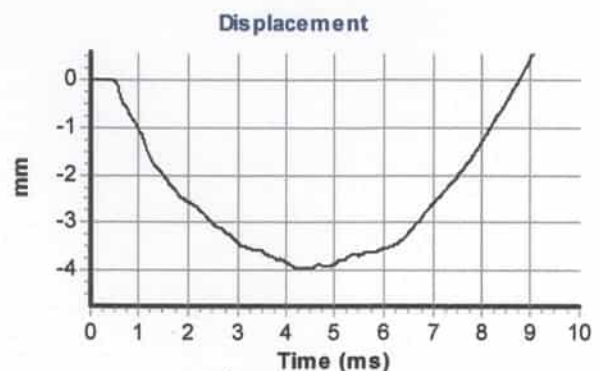
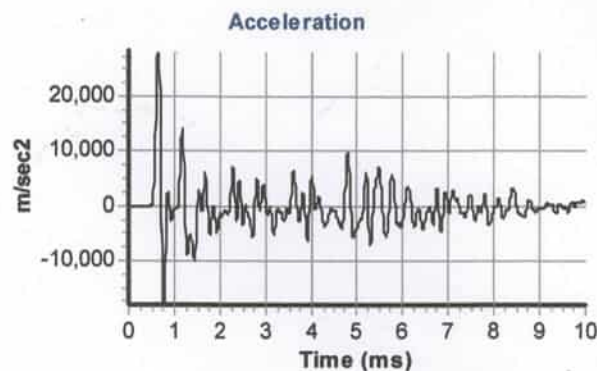
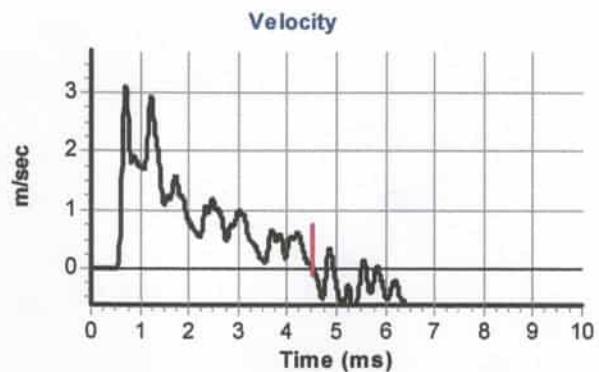
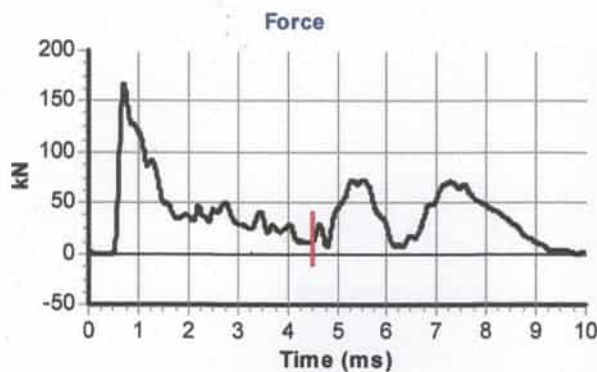
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.4
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 72572
Accelerometer No.2: 72572

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

STRUCTURAL SOILS - 90220



Calculations

Area of Rod A (mm²): 957
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 309

Energy Ratio E_r (%): **65**

Signed: J.LOCK

Title: FITTER

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: DART384
Test Date: 09/07/2024
Report Date: 09/07/2024
File Name: DART384.spt
Test Operator: JL

Instrumented Rod Data

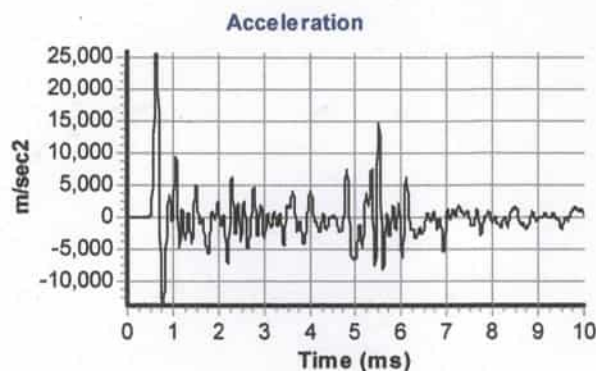
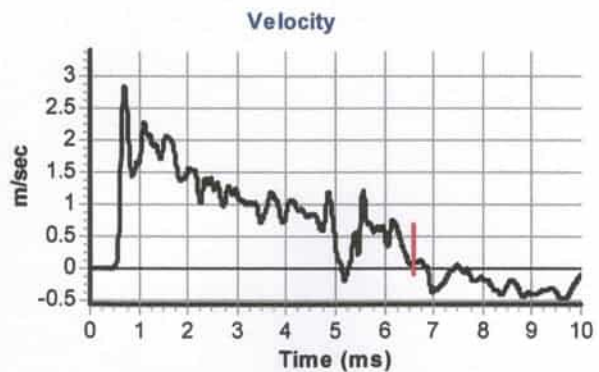
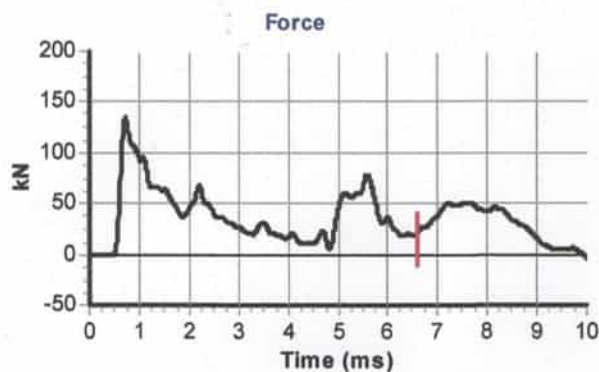
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.4
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 72572
Accelerometer No.2: 72572

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

STRUCTURAL SOIL - 89906



Calculations

Area of Rod A (mm²): 957
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 320

Energy Ratio E_r (%): **68**

Signed: J.LOCK

Title: FITTER

The recommended calibration interval is 12 months

Dynamic Sampling Uk Ltd
Unit 8 Victory Park
Victory Road
Derby
DE248ZF

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref: 110.49
Test Date: 17/05/2024
Report Date: 17/05/2024
File Name: 110.49.spt
Test Operator: B.HUNTER

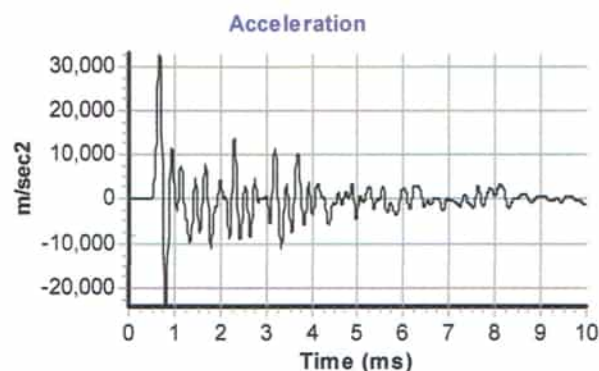
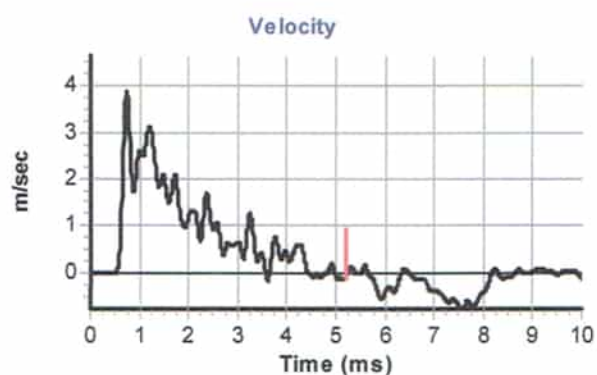
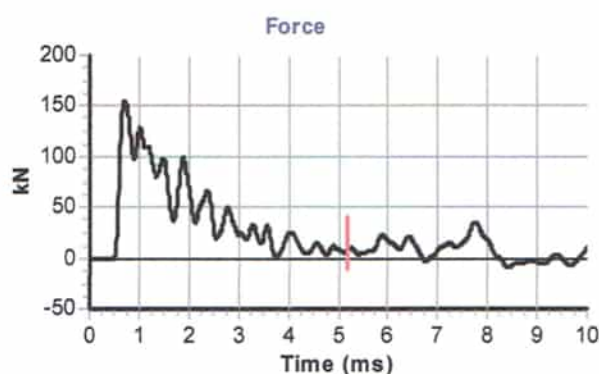
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 62901
Accelerometer No.2: 69902

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 381

Energy Ratio E_r (%): **81**

Signed: B.Hunter
Title: Operations Manager