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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: County Series

Map date: 1909

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1909
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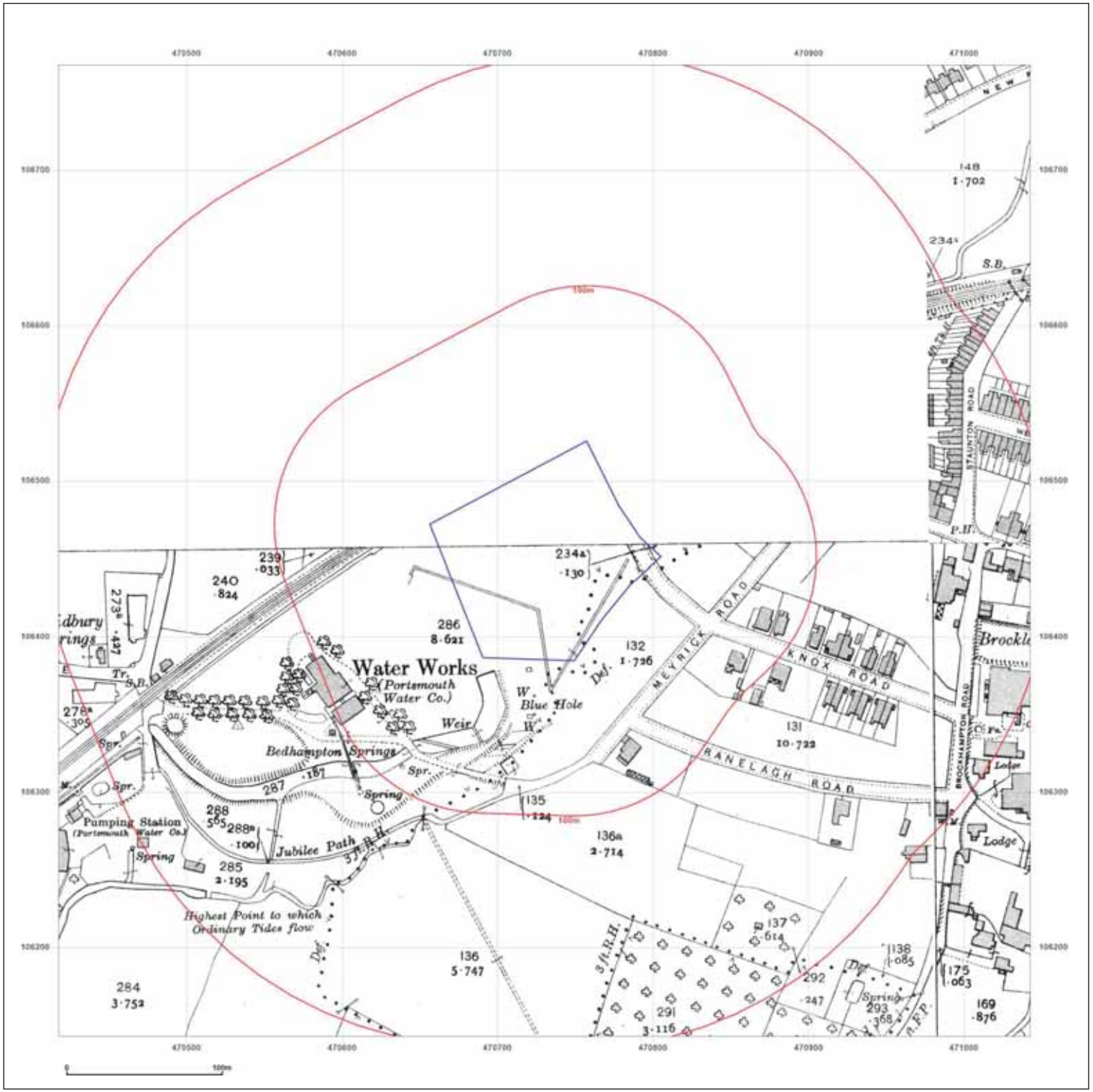

emapsite™

Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500

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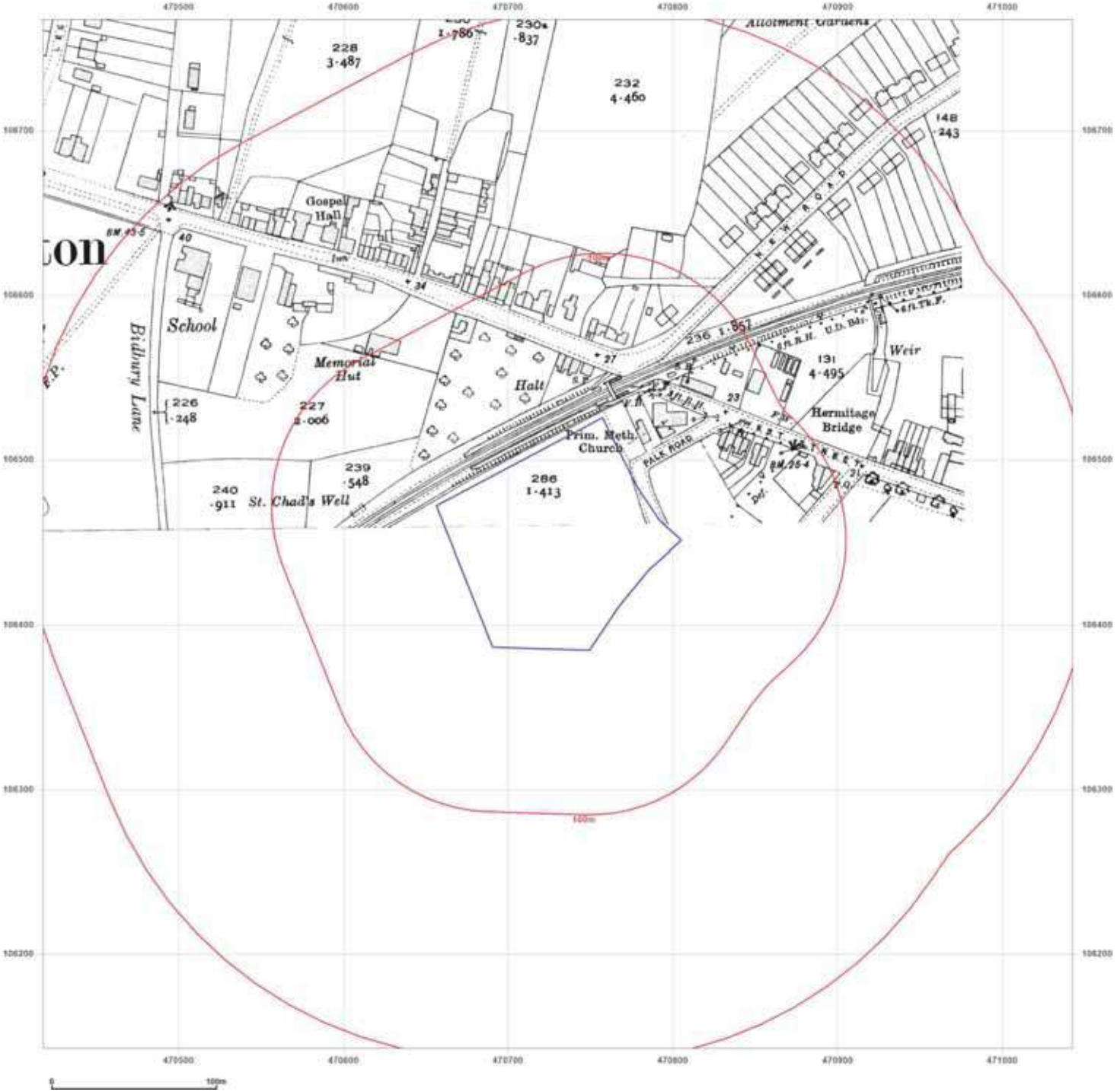

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1932
Revised 1932
Edition N/A
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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: County Series

Map date: **1937-1940**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1937
Revised 1937
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1940
Revised 1940
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1939
Revised 1939
Edition N/A
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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1951-1952**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1948

Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1948

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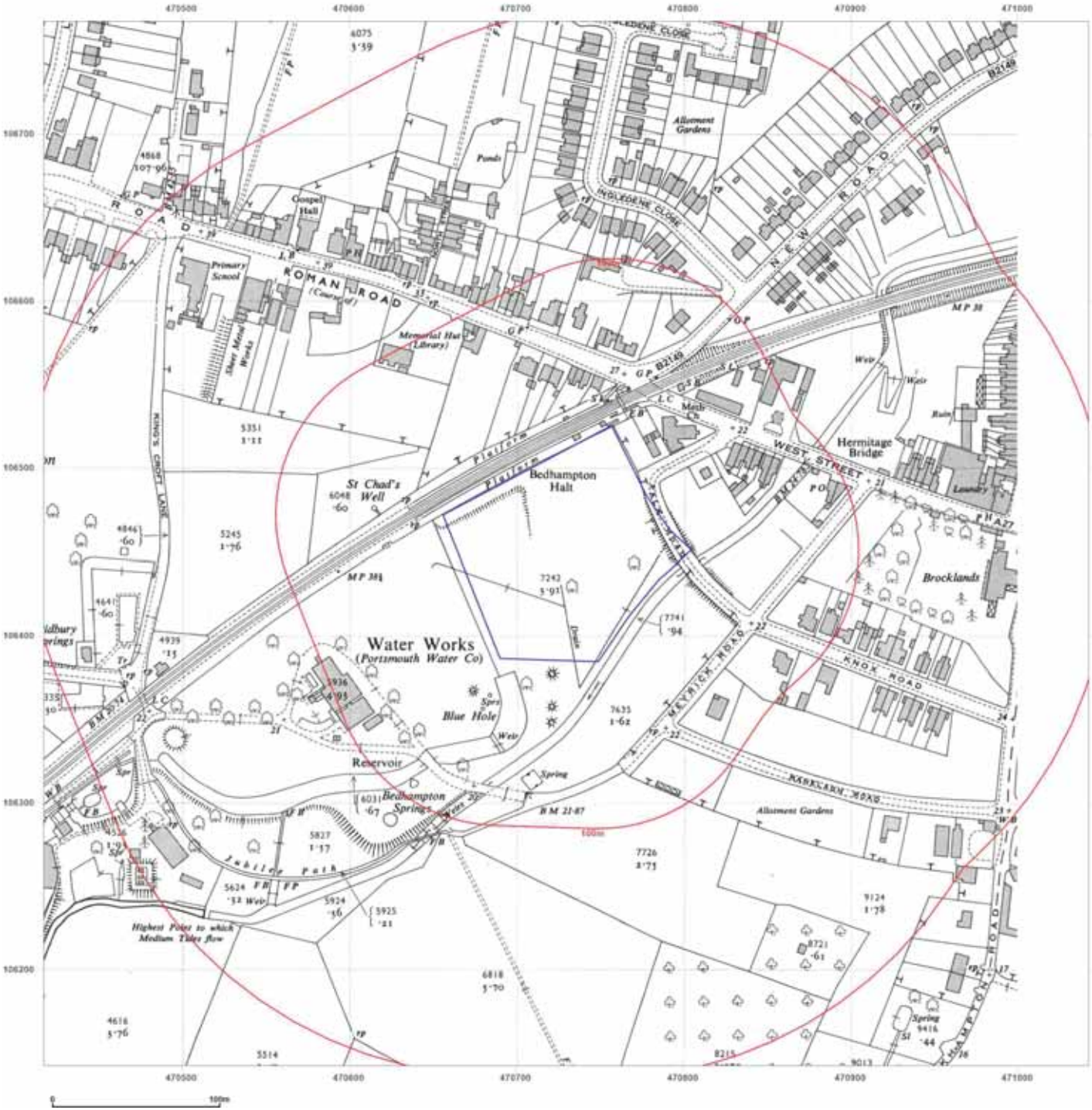

emapsite™

Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1953**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1951
Revised 1953
Edition N/A
Copyright N/A
Levelled 1948

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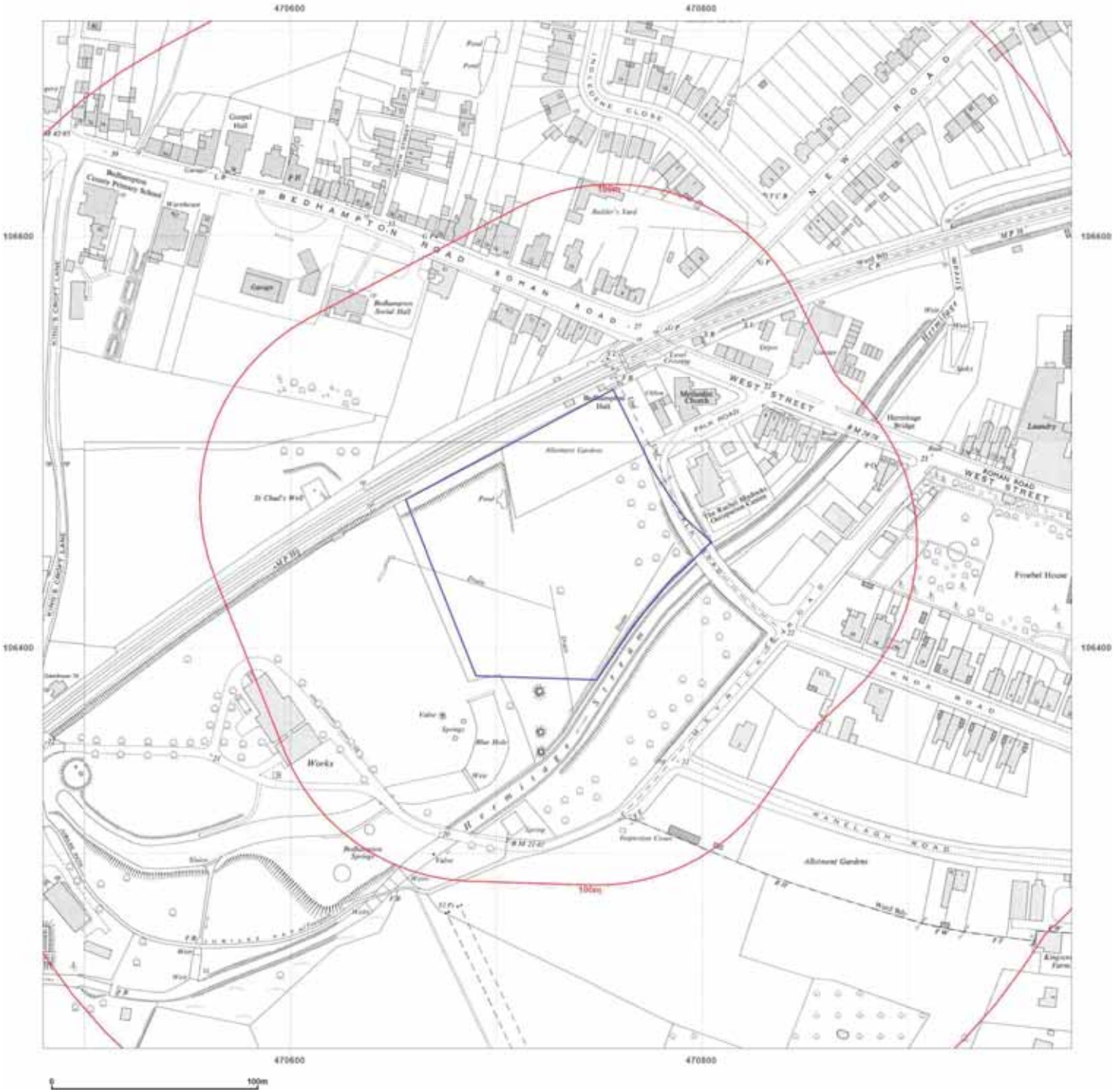

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1959**

Scale: 1:1,250

Printed at: 1:2,000

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1961**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1960
Revised 1960
Edition 1961
Copyright 1961
Levelled 1957

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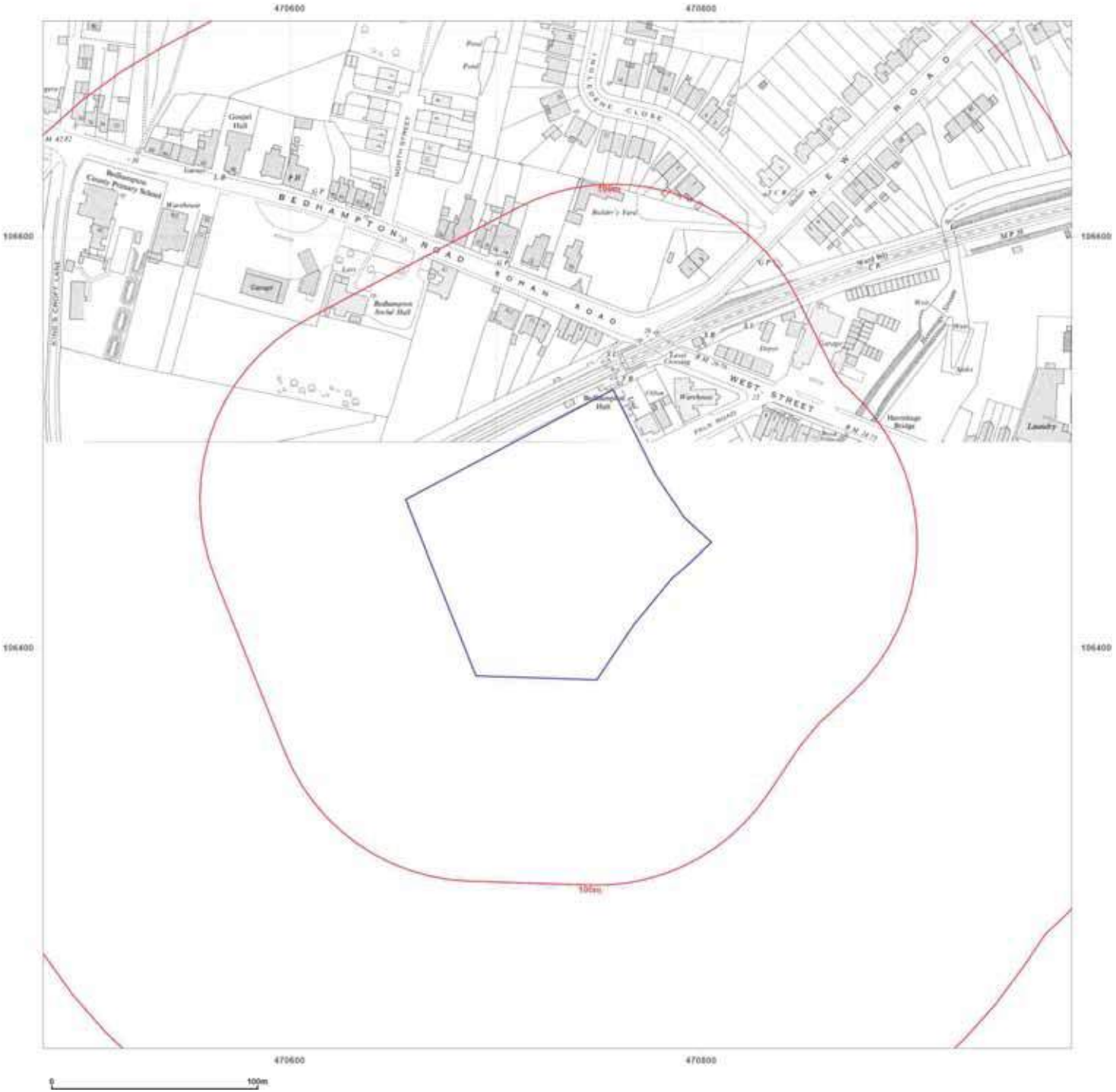

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1963**

Scale: 1:1,250

Printed at: 1:2,000

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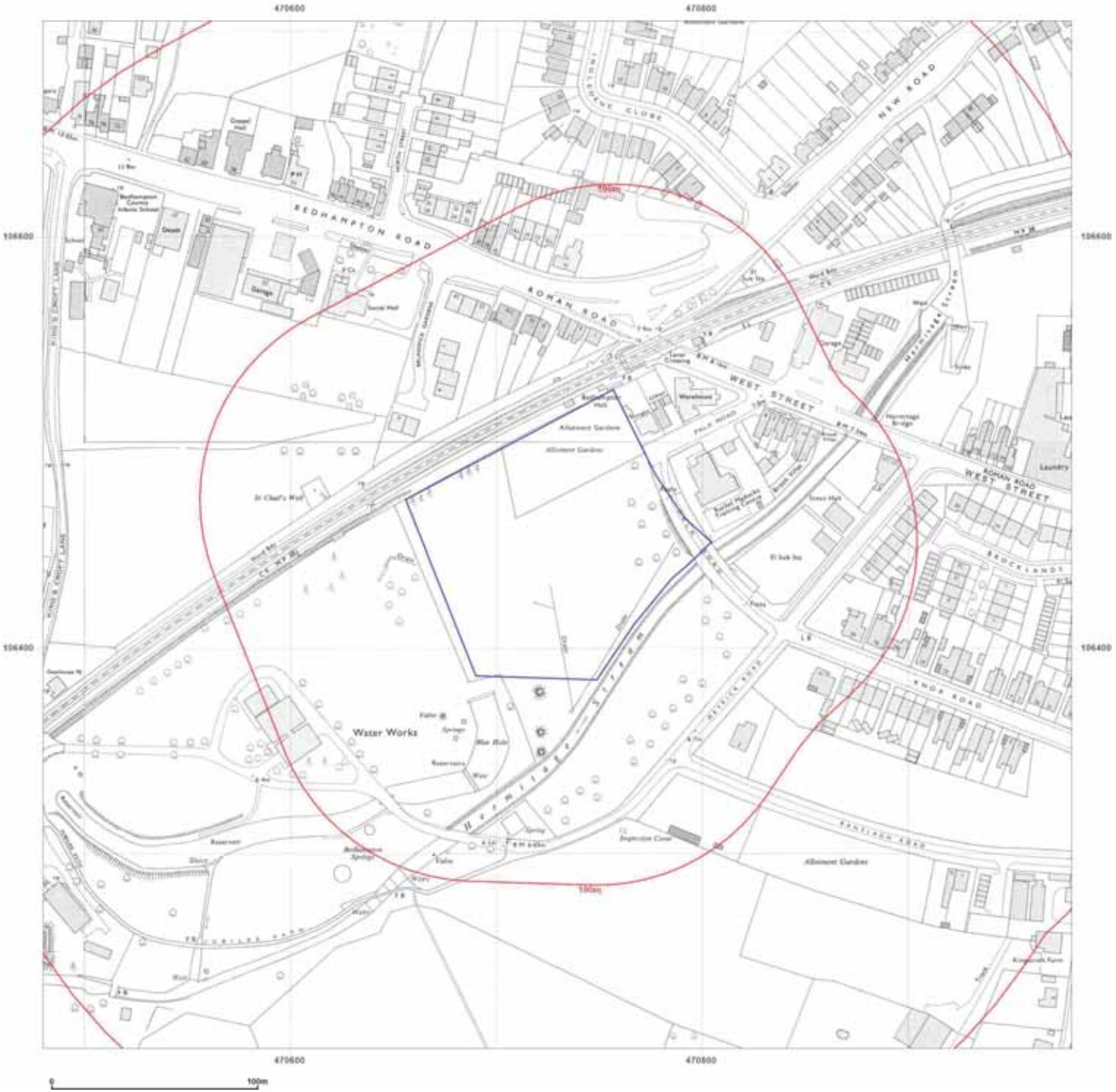

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1969-1973**

Scale: 1:1,250

Printed at: 1:2,000

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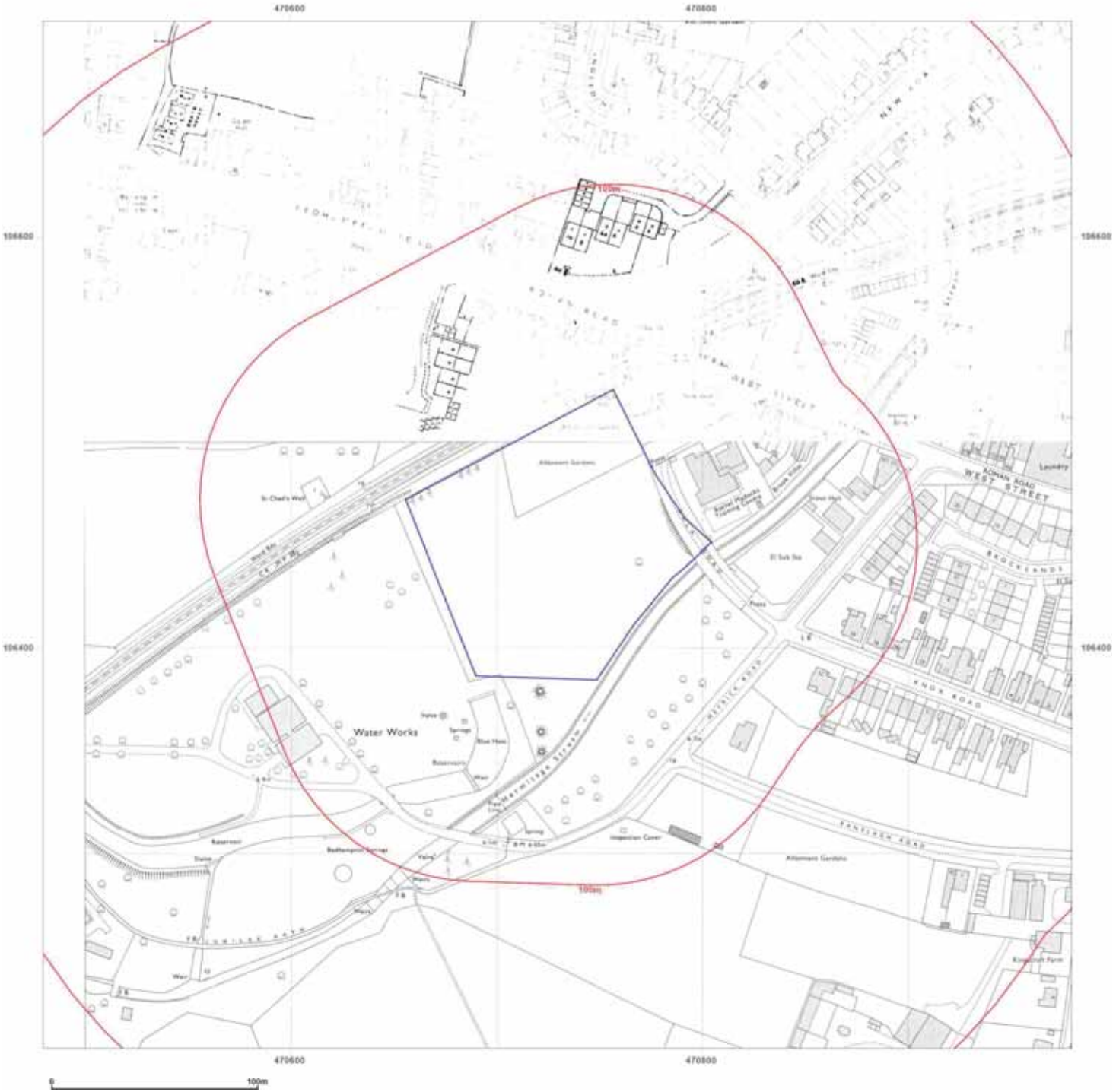

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1973-1978**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1979
Levelled N/A

Surveyed 1958
Revised 1972
Edition N/A
Copyright 1973
Levelled 1957

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: **1987-1991**

Scale: 1:1,250

Printed at: 1:2,000

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Revised 1981
Edition N/A
Copyright 1981
Levelled N/A

Surveyed 1958
Revised 1967
Edition N/A
Copyright 1967
Levelled 1958

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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: National Grid

Map date: 1993

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
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Surveyed 1993
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Edition N/A
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Edition N/A
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Site Details:

Client Ref: EMS_734687_955963
Report Ref: EMS-734687_955963
Grid Ref: 470730, 106455

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

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Appendix 2 – Exploratory Hole Logs

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS1**
Job No: CRM.1668.023	Dates: Start 25-11-21, Finish 25-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Depth (m)	Samples & In Situ Testing: No/Type	Results	Depth (m)	Stratum Description
			0.10	MADE GROUND: TARMACADAM.
			0.45	MADE GROUND: Type 1 subbase of sandy GRAVEL.
0.60	ES		0.70	MADE GROUND: (Soft) green sandy gravelly CLAY. Gravel is angular to rounded fine to coarse brick, chert, and concrete.
1.00	ES			MADE GROUND: (Firm) brown gravelly slightly sandy CLAY. Gravel is angular yo subangular fine to coarse brick.
1.20 - 1.65	SPTLS	N 8	1.30	1.20 - 1.65 Soft to firm, low strength.
1.60	ES		1.70	MADE GROUND: (Soft) black sandy gravelly CLAY. Gravel is angular to rounded fine to coarse brick, concrete and chert.
2.00	D	N 6		(Firm) brown mottled light greenish grey slightly sandy CLAY.
2.00 - 2.45	ES, SPTLS			2.00 - 2.45 Soft, low strength.
3.00	D	N 6		
3.00 - 3.45	SPTLS			3.00 - 3.45 Soft, low strength.
				3.50 - 5.45 Becoming red and light greenish grey.
4.00	D	N 15		
4.00 - 4.45	SPTLS			4.00 - 4.45 Firm to stiff, medium strength.
5.00	D	N 17		
5.00 - 5.45	SPTLS			5.00 - 5.45 Stiff, medium strength.
			5.45	Borehole completed at 5.45m.
			{8.00}	

Water Levels: Well — Level (mAD) — Legend

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-5.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 5.00m begl, granular response zone (5.00m-1.00m), bentonite seal 1.00m-0.15m, 0.15m-0.00m flush steel cover.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS2**
Job No: CRM.1668.023	Dates: Start 25-11-21, Finish 25-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.15			MADE GROUND: TARMACADAM.
					0.40			MADE GROUND: Type 1 subbase of sandy GRAVEL.
		0.50	ES		0.60			MADE GROUND: Green very clayey gravelly coarse SAND. Gravel us angular to rounded fine to coarse flint and brick.
		1.00	D		1.00			(Firm) brown mottled light greenish grey slightly sandy gravelly CLAY. Gravel is subrounded to rounded fine to coarse flint.
		1.20 - 1.65	SPTLS	N 23				(Firm) brown mottled light greenish grey slightly sandy CLAY. 1.20 - 1.65 Stiff, high strength.
		2.00	D	N 24				
		2.00 - 2.45	SPTLS					2.00 - 2.45 Stiff, high strength.
								2.50 - 3.00 Becoming (very stiff).
		3.00	D	N 50				
		3.00 - 3.44	SPTLS					3.00 - 3.44 Very stiff, very high strength. Refused at 3.435m begl.
					3.44			Borehole completed at 3.44m.
					{8.00}			

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-3.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS3**
Job No: CRM.1668.023	Dates: Start 25-11-21, Finish 25-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Stratum Description
0.30	ES		0.50	MADE GROUND: Wild growth over dark brown slightly clayey gravelly medium SAND with a low cobble content of angular concrete. Gravel is angular to rounded fine to coarse brick concrete and chert.
0.90	D			(Firm) brown mottled light greenish grey slightly sandy gravelly CLAY. Gravel is subrounded to rounded fine to coarse flint.
1.00	ES			
1.20 - 1.65	SPTLS	N 7	1.40	1.20 - 1.65 Soft, low strength.
				(Firm) brown mottled light greenish grey slightly sandy CLAY.
2.00	D	N 10		
2.00 - 2.45	SPTLS		2.50	2.00 - 2.45 Firm, medium strength.
				(Very) stiff red and light gret slightly sandy CLAY.
3.00	D	N 50		
3.00 - 3.45	SPTLS		3.45	3.00 - 3.45 Very stiff, very high strength. Refused at 3.445m begl.
			{8.00}	Borehole completed at 3.45m.

Well: Water Levels: Legend: Level (mAD):

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-3.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 3.00m begl, granular response zone (3.00m-1.00m), bentonite seal 1.00m-0.00m, plain pipe 0.00m-1.00m agl (above ground level).

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS7**
Job No: CRM.1668.023	Dates: Start 26-11-21, Finish 26-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Stratum Description
			0.30	MADE GROUND: Black slightly gravelly slightly sandy CLAY. Gravel is angular to subangular fine to coarse brick and concrete
0.80	D			MADE GROUND: (Soft) green slightly sandy slightly gravelly CLAY. Gravel is angular to subaagular brick and concrete.
1.00	ES		1.00	
1.20 - 1.65	SPT	N 14		1.00 Plywood sheets encountered. MADE GROUND: (Stiff) red and brown slightly sandy gravelly CLAY. Gravel is angular fine to coarse chert and concrete.
1.40	ES		1.50	1.20 - 1.65 Firm, medium stength.
1.90	ES			1.50 Cobble encountered.
2.00	D	N 5		(Soft) green slightly gravelly CLAY. Gravel is angular coarse flint.
2.00 - 2.45	SPT			2.00 - 2.45 Soft, low strength.
3.00	D	N 6		
3.00 - 3.45	SPT			3.00 - 3.45 Soft, low strength.
3.80 - 4.00	D		3.80	3.60 - 4.00 Borehole collapsed.
4.00 - 4.30	D	N 4		Brown clayey sandy GRAVEL of angular to subangular flint.
4.00 - 4.45	SPT			
4.30 - 4.45	D		4.30	
			4.45	Brown mottled light greenish grey and red slightly sandy CLAY.
				Borehole completed at 4.45m.
			{8.00}	

Water Levels: ▽

Legend: 0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-4.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater encountered at 2.25m begl after completion.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
26/11/21	2.25		

All dimensions in metres
Scale 1:50

Logged By: ES

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS8**
Job No: CRM.1668.023	Dates: Start 26-11-21, Finish 26-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Stratum Description
			0.15	MADE GROUND: TARMACADAM.
			0.45	MADE GROUND: Type 1 subbase of sandy GRAVEL.
0.50	ES		0.80	MADE GROUND: (Firm) brown sligjtly sandy gravelly CLAY. Gravel is angular to subamgular fine to coarse chert and brick.
1.00	D	N 3		(Soft) green slightly gravelly CLAY. Gravel is angular coarse flint.
1.00 - 1.45	SPTLS			1.00 - 1.45 Very soft, very low strength.
2.00	D	N 0		
2.00 - 2.45	SPTLS			2.00 - 2.45 Very soft, extremely low strength.
3.00	D	N 4	3.00	
3.00 - 3.45	SPTLS			3.00 - 3.45 Loose. Brown clayey sandy GRAVEL of angular to subangular flint.
4.00	D	N 26		
4.00 - 4.45	SPTLS			4.00 - 4.45 Medium dense.
			4.45	Borehole completed at 4.45m.
			{8.00}	

Legend: 0 1 2 3 4 5 6 7 8

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.00m begl. Dynamic sampled 1.00m-4.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 4.00m begl, granular response zone (4.00m-1.00m), bentonite seal 1.00m-0.15m, 0.15m-0.00m flush steel cover.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

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Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS10**
Job No: CRM.1668.023	Dates: Start 26-11-21, Finish 26-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.15			MADE GROUND: TARMACADAM.
					0.40			MADE GROUND: Type 1 subbase of sandy GRAVEL.
		0.80	ES					MADE GROUND: Black sandy gravelly CLAY. Gavel is angular fine to coarse brick, concrete, chalk and flint.
		1.00	D	N 3	1.00			
		1.00 - 1.45	SPTLS					1.00 - 1.45 Very soft, very low strength. (Soft) green and brown slightly sandy slightly gravelly CLAY. Gravel is angular fine to coarse chert.
		2.00	D	N 7				
		2.00 - 2.45	SPTLS					2.00 - 2.45 Soft, low strength.
					2.70			2.50 - 3.00 Borehole collapsed.
								Brown clayey sandy GRAVEL of angular to subangular flint.
		3.00	D	N 7				
		3.00 - 3.45	SPTLS					3.00 - 3.45 Loose.
					3.50			Soft light brown slightly sandy gravelly CLAY. Gravel is subangular fine to coarse chalk.
		4.00	D	N 13				
		4.00 - 4.45	SPTLS					4.00 - 4.45 Firm, medium strength.
					4.45			Borehole completed at 4.45m.
					{8.00}			

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.00m begl. Dynamic sampled 1.00m-4.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

1.0 ENZYGO WS LOG CRM.1668.023 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 3/12/21

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS11**
Job No: CRM.1668.023	Dates: Start 26-11-21, Finish 26-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.10			MADE GROUND: TARMACADAM.
					0.40			MADE GROUND: Type 1 subbase of sandy GRAVEL.
		0.50	ES					MADE GROUND: Black sandy gravelly CLAY. Gavel is angular fine to coarse brick, concrete, chalk and flint.
					1.10			1.00 Brick cobble encountered.
		1.20 1.20 - 1.65	D SPTLS	N 4				(Soft) green and brown slightly sandy gravelly CLAY. Gravel is angular fine to coarse chert. 1.20 - 1.65 Soft, very low strength.
		2.00 2.00 - 2.45	D SPTLS	N 6				2.00 - 2.45 Soft, low strength.
					2.50			Brown clayey sandy GRAVEL of angular to subangular flint.
		3.00 3.00 - 3.45	D SPTLS	N 7				3.00 - 3.45 Loose.
		4.00 4.00 - 4.45	D SPTLS	N 11	4.00			(Soft) light brown slightly sandy gravelly CLAY. Gravel is subangular fine to coarse chalk.
					4.45			4.00 - 4.45 Firm, medium strength.
								Borehole completed at 4.45m.
					{8.00}			

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-4.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Park Road, Havant PO91NL				**WS12**
Job No: CRM.1668.023	Dates: Start 25-11-21, Finish 25-11-21	Ground Level (m)	Co-Ordinates	
Client: Bellway Homes				Sheet: 1 of 1

Well	Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
					0.15			MADE GROUND: TARMACADAM.
					0.45			MADE GROUND: Type 1 subbase of sandy GRAVEL.
								MADE GROUND: Green very clayey gravelly coarse SAND. Gravel us angular to rounded fine to coarse flint and brick
		1.00	ES					
		1.20 - 1.65	SPTLS	N 13	1.20			1.20 - 1.65 Firm, medium strength. (Firm) brown mottled light greenish grey slightly sandy gravelly CLAY. Gravel is subrounded to rounded fine to coarse flint.
					1.90			
		2.00	D	N 27	2.00			Brown clayey sandy GRAVEL of angular to subangular flint.
		2.00 - 2.45	SPTLS					2.00 - 2.45 Stiff, high strength. (Firm) brown mottled light greenish grey and red slightly sandy CLAY.
								2.50 - 3.00 Borehole collapsed.
		3.00	D	N 23	3.00			2.90 Subrounded cobble of flint.
		3.00 - 3.45	SPT					(Firm) brown mottled light greenish grey and red slightly sandy CLAY.
					3.45			3.00 - 3.45 Stiff, high strength.
								Borehole completed at 3.45m.
					{8.00}			

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8

General Remarks

EQUIPMENT: Premier 110 compact window sampling tracked rig.
METHOD: Hand dug inspection pit 0.00m-1.20m begl. Dynamic sampled 1.20m-3.00m begl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

All dimensions in metres
Scale 1:50

Logged By: ES

1.0 ENZYGO WS LOG CRM.1668.023 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 3/12/21

Appendix 3 – Chemical Testing

Steve Rhodes
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i2 Analytical Ltd.
7 Woodshots Meadow,
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Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
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Analytical Report Number : 21-26456

Project / Site name:	Park Road Havant	**Samples received on:**	01/12/2021
Your job number:	CRM 1668 023	**Samples instructed on/ Analysis started on:**	01/12/2021
Your order number:	CRM 1668 022	**Analysis completed by:**	13/12/2021
Report Issue Number:	1	**Report issued on:**	13/12/2021
Samples Analysed:	11 soil samples		

Signed:

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102416	2102417	2102418	2102419	2102420
Sample Reference				WS1	WS1	WS1	WS1	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	1.60	2.00	0.30
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	33
Moisture Content	%	0.01	NONE	12	19	21	17	16
Total mass of sample received	kg	0.001	NONE	0.50	1.0	1.1	1.0	1.5

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SFS				SFS

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	-	-	-	8.2
Organic Matter (automated)	%	0.1	MCERTS	2.4	-	-	-	5.2
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.4	-	-	-	3.0

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.4	-	-	-	0.18
Anthracene	mg/kg	0.05	MCERTS	0.28	-	-	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.0	-	-	-	0.39
Pyrene	mg/kg	0.05	MCERTS	1.7	-	-	-	0.38
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.96	-	-	-	0.23
Chrysene	mg/kg	0.05	MCERTS	0.93	-	-	-	0.23
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	-	-	-	0.23
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.53	-	-	-	0.27
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.95	-	-	-	0.27
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.61	-	-	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.19	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.67	-	-	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	11.4	-	-	-	2.18

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-	-	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	-	-	-	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	5.5
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	-	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	-	-	-	51
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	-	-	-	54
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	-	-	-	120
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	1.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	-	-	-	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	-	-	-	180

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102416	2102417	2102418	2102419	2102420
Sample Reference				WS1	WS1	WS1	WS1	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	1.60	2.00	0.30
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH_CU_1D_AL}$	mg/kg	8.4	NONE	< 8.4	-	-	-	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	< 10	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	3.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	11	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	24	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH_CU_1D_AR}$	mg/kg	8.4	NONE	< 8.4	-	-	-	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	11	< 10	35	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	11	-	-	-	< 10
TPH (>C5 - C7) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH (>C7 - C8) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH (C8 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
TPH (C10 - C12) $_{EH_CU_1D_TOTAL}$	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH (C12 - C16) $_{EH_CU_1D_TOTAL}$	mg/kg	4	MCERTS	< 4.0	-	-	-	< 4.0
TPH (C16 - C21) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	4.0	-	-	-	< 1.0
TPH (C21 - C35) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	4.0	-	-	-	< 1.0
TPH (C35 - C44) $_{EH_CU_1D_TOTAL}$	mg/kg	10	NONE	< 10	-	-	-	< 10
TPH Total C5 - C44 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	11	-	-	-	< 10

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102421	2102422	2102423	2102424	2102425
Sample Reference				WS3	WS2	WS12	WS9	WS9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.50	1.00	1.00	1.40
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	14	12	28	22
Total mass of sample received	kg	0.001	NONE	1.5	1.0	1.0	1.5	1.5

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A		SFS	SFS	SFS	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	7.9	8.0	7.6	-
Organic Matter (automated)	%	0.1	MCERTS	-	2.7	2.5	1.8	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	1.6	1.4	1.0	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	0.60	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	0.39	1.3	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	-	0.38	1.1	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.21	0.80	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	-	0.23	0.62	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.28	0.79	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.18	0.47	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.27	0.68	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	0.41	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	0.47	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	1.94	7.24	< 0.80	-

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	13	9.8	6.9	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.2	0.6	0.4	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	21	23	19	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	22	25	13	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	39	61	440	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	14	19	14	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	60	73	66	-

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Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102421	2102422	2102423	2102424	2102425
Sample Reference				WS3	WS2	WS12	WS9	WS9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.50	1.00	1.00	1.40
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	3.0	3.1	< 1.0	2.7	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	2.9	2.9	< 2.0	2.1	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH_CU_1D_AL}$	mg/kg	8.4	NONE	-	< 8.4	< 8.4	< 8.4	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-	< 10	< 10	< 10	-

TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH_CU_1D_AR}$	mg/kg	8.4	NONE	-	< 8.4	< 8.4	< 8.4	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-	< 10	< 10	< 10	-

TPH (>C5 - C7) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
TPH (>C7 - C8) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
TPH (C8 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	-
TPH (C10 - C12) $_{EH_CU_1D_TOTAL}$	mg/kg	2	MCERTS	-	3.1	< 2.0	2.7	-
TPH (C12 - C16) $_{EH_CU_1D_TOTAL}$	mg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	-
TPH (C16 - C21) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
TPH (C21 - C35) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	-
TPH (C35 - C44) $_{EH_CU_1D_TOTAL}$	mg/kg	10	NONE	-	< 10	< 10	< 10	-
TPH Total C5 - C44 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	-	< 10	< 10	< 10	-

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102426
Sample Reference				WS9
Sample Number				None Supplied
Depth (m)				1.90
Date Sampled				25/11/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	20
Total mass of sample received	kg	0.001	NONE	1.5

Asbestos in Soil	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-
Organic Matter (automated)	%	0.1	MCERTS	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-

Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-

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Analytical Report Number: 21-26456
Project / Site name: Park Road Havant
Your Order No: CRM 1668 022

Lab Sample Number				2102426
Sample Reference				WS9
Sample Number				None Supplied
Depth (m)				1.90
Date Sampled				25/11/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH_CU_1D_AL}$	mg/kg	8.4	NONE	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-

TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH_CU_1D_AR}$	mg/kg	8.4	NONE	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-

TPH (>C5 - C7) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-
TPH (>C7 - C8) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-
TPH (C8 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	-
TPH (C10 - C12) $_{EH_CU_1D_TOTAL}$	mg/kg	2	MCERTS	-
TPH (C12 - C16) $_{EH_CU_1D_TOTAL}$	mg/kg	4	MCERTS	-
TPH (C16 - C21) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-
TPH (C21 - C35) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-
TPH (C35 - C44) $_{EH_CU_1D_TOTAL}$	mg/kg	10	NONE	-
TPH Total C5 - C44 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	-

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

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Analytical Report Number : 21-26456
Project / Site name: Park Road Havant

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2102416	WS1	None Supplied	0.9	Brown loam and clay with gravel.
2102417	WS1	None Supplied	1	Brown clay and sand.
2102418	WS1	None Supplied	1.6	Brown clay and loam with gravel.
2102419	WS1	None Supplied	2	Brown clay.
2102420	WS3	None Supplied	0.3	Brown loam and clay with gravel and vegetation.
2102421	WS3	None Supplied	1	Brown clay and sand with gravel.
2102422	WS2	None Supplied	0.5	Brown loam and clay with gravel and vegetation.
2102423	WS12	None Supplied	1	Brown loam and clay with gravel and vegetation.
2102424	WS9	None Supplied	1	Brown clay and loam with gravel and vegetation.
2102425	WS9	None Supplied	1.4	Brown clay and loam with gravel.
2102426	WS9	None Supplied	1.9	Brown clay and sand.

Analytical Report Number : 21-26456
Project / Site name: Park Road Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Analytical Report Number : 21-26456
Project / Site name: Park Road Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 21-26717

Project / Site name:	Park Road Havant	**Samples received on:**	01/12/2021
Your job number:	CRM.1668,023	**Samples instructed on/ Analysis started on:**	02/12/2021
Your order number:	CRM.1688.022	**Analysis completed by:**	14/12/2021
Report Issue Number:	1	**Report issued on:**	14/12/2021
Samples Analysed:	4 soil samples		

Signed: Karolina Marek

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

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

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 21-26717
Project / Site name: Park Road Havant
Your Order No: CRM.1688.022

Lab Sample Number				2103884	2103885	2103886	2103887
Sample Reference				WS8	WS1	WS9	WS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.60	0.90	0.90
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	32
Moisture Content	%	0.01	NONE	15	13	19	8.7
Total mass of sample received	kg	0.001	NONE	0.40	1.5	1.5	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile - Loose Fibres
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Detected
Asbestos Analyst ID	N/A	N/A	N/A			DSA	DSA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	7.5	8.3
Organic Matter (automated)	%	0.1	MCERTS	-	-	0.9	0.8
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	0.5	0.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.52
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.75
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	5.3
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	1.3
Fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	8.9
Pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	8.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	5.3
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	3.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	5.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	2.9
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	6.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	2.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	0.81
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	3.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	< 0.80	55.6

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	5.9	10
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.5	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	0.4
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	18	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	10	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	48	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	12	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	35	79

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Analytical Report Number: 21-26717
Project / Site name: Park Road Havant
Your Order No: CRM.1688.022

Lab Sample Number				2103884	2103885	2103886	2103887
Sample Reference				WS8	WS1	WS9	WS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.60	0.90	0.90
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH_CU_1D_AL}$	mg/kg	8.4	NONE	-	-	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-	-	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	14
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	39
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	110
TPH-CWG - Aromatic > EC35 - EC44 $_{EH_CU_1D_AR}$	mg/kg	8.4	NONE	-	-	< 8.4	83
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	160
TPH-CWG - Aromatic (EC5 - EC44) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-	-	< 10	240
TPH (>C5 - C7) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
TPH (>C7 - C8) $_{HS_1D_TOTAL}$	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0
TPH (C8 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1
TPH (C10 - C12) $_{EH_CU_1D_TOTAL}$	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0
TPH (C12 - C16) $_{EH_CU_1D_TOTAL}$	mg/kg	4	MCERTS	-	-	< 4.0	14
TPH (C16 - C21) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-	-	< 1.0	39
TPH (C21 - C35) $_{EH_CU_1D_TOTAL}$	mg/kg	1	MCERTS	-	-	< 1.0	110
TPH (C35 - C44) $_{EH_CU_1D_TOTAL}$	mg/kg	10	NONE	-	-	< 10	83
TPH Total C5 - C44 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	-	-	< 10	240

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 21-26717
Project / Site name: Park Road Havant
Your Order No: CRM.1688.022

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2103887	WS10	0.90	136	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

Analytical Report Number : 21-26717
Project / Site name: Park Road Havant

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2103884	WS8	None Supplied	0.5	Brown clay and sand with gravel.
2103885	WS1	None Supplied	0.6	Brown clay and sand with gravel.
2103886	WS9	None Supplied	0.9	Brown clay and sand.
2103887	WS10	None Supplied	0.9	Brown loam and clay with stones.

Analytical Report Number : 21-26717
Project / Site name: Park Road Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Analytical Report Number : 21-26717
Project / Site name: Park Road Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 21-26457

Project / Site name:	Park Road Havant	**Samples received on:**	01/12/2021
Your job number:	CRM 1668 023	**Samples instructed on/ Analysis started on:**	01/12/2021
Your order number:	CRM 1668 022	**Analysis completed by:**	10/12/2021
Report Issue Number:	1	**Report issued on:**	10/12/2021
Samples Analysed:	2 wac multi samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-26457**						
					Client: ENZYGOGEO		
Location	**Park Road Havant**						
Lab Reference (Sample Number)	2102525				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	25/11/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS1						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	4.1				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.30				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL #	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	8.1				--	>6	--
Acid Neutralisation Capacity (mol / kg)	4.3				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg			
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.032	0.025		0.25	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	< 0.0010	0.0029		0.026	0.5	10	70
Copper *	0.019	0.011		0.12	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	< 0.0030	< 0.0030		0.025	0.5	10	30
Nickel *	0.0033	0.0061		0.058	0.4	10	40
Lead *	< 0.0050	0.0056		0.053	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.018	0.0087		0.097	4	50	200
Chloride *	7.0	< 4.0		33	800	15000	25000
Fluoride	1.3	1.2		12	10	150	500
Sulphate *	3.0	2.3		24	1000	20000	50000
TDS*	110	66		700	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	19	10		110	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.0						
Dry Matter (%)	81						
Moisture (%)	19						
Stage 1							
Volume Eluate L2 (litres)	0.29						
Filtered Eluate VE1 (litres)	0.18						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Report No:	**21-26457**						
					Client: ENZYGOGEO		
Location	**Park Road Havant**						
Lab Reference (Sample Number)	2102526				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	25/11/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS11						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	1.3				3%	5%	6%
Loss on Ignition (%) **	3.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.30				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL #	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	5.78				100	--	--
pH (units)**	7.8				--	>6	--
Acid Neutralisation Capacity (mol / kg)	6.5				--	To be evaluated	To be evaluated
Eluate Analysis	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	mg/l	mg/l		mg/kg			
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.046	0.029		0.31	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	< 0.0010	< 0.0010		0.0053	0.5	10	70
Copper *	0.021	0.012		0.13	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.043	0.017		0.20	0.5	10	30
Nickel *	0.0040	0.0043		0.043	0.4	10	40
Lead *	< 0.0050	< 0.0050		0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.022	0.0111		0.12	4	50	200
Chloride *	7.0	< 4.0		40	800	15000	25000
Fluoride	0.24	0.19		2.0	10	150	500
Sulphate *	29	19		200	1000	20000	50000
TDS*	170	110		1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	33	33		330	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.0						
Dry Matter (%)	83						
Moisture (%)	17						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.20						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation ** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Analytical Report Number : 21-26457
Project / Site name: Park Road Havant

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2102525	WS1	None Supplied	1	Brown clay and sand.
2102526	WS11	None Supplied	0.5	Brown clay and loam with gravel and vegetation.

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Analytical Report Number : 21-26457
Project / Site name: Park Road Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D
Preparation WAC leachate		In-house method	L043-PL	W
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031-PL	W
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W
PCB's by GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D
BTEX (Sum of BTEX compounds) in soil	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046-PL	W
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D
Mineral Oil in Soil C10 - C40	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS.	In-house method based on USEPA 8270	L076-PL	D
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D

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The results included within the report are representative of the samples submitted for analysis.

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

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The results included within the report are representative of the samples submitted for analysis.

Appendix 4 – Geotechnical Testing

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

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

4041

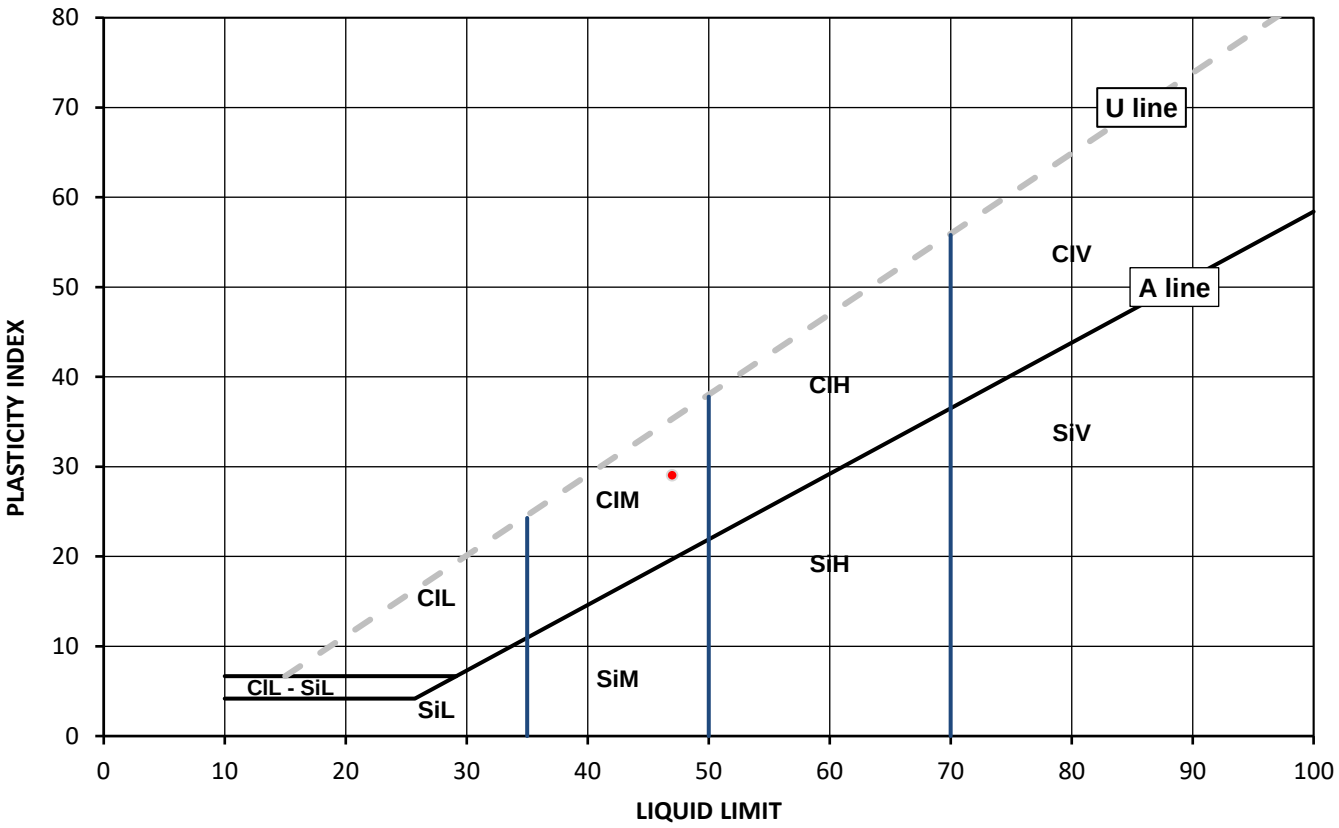
Client:	Enzygo Geoenvironmental Ltd	Client Reference:	CRM.1668.022
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104837	Depth Top [m]:	2.00
Hole No.:	WS1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Orangish brown slightly sandy CLAY with fragments of rootlet		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
20	47	18	29	100



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

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

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

Remarks:

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Signed:

Monika Janoszek
PL Deputy Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 22/12/2021

GF 232.12

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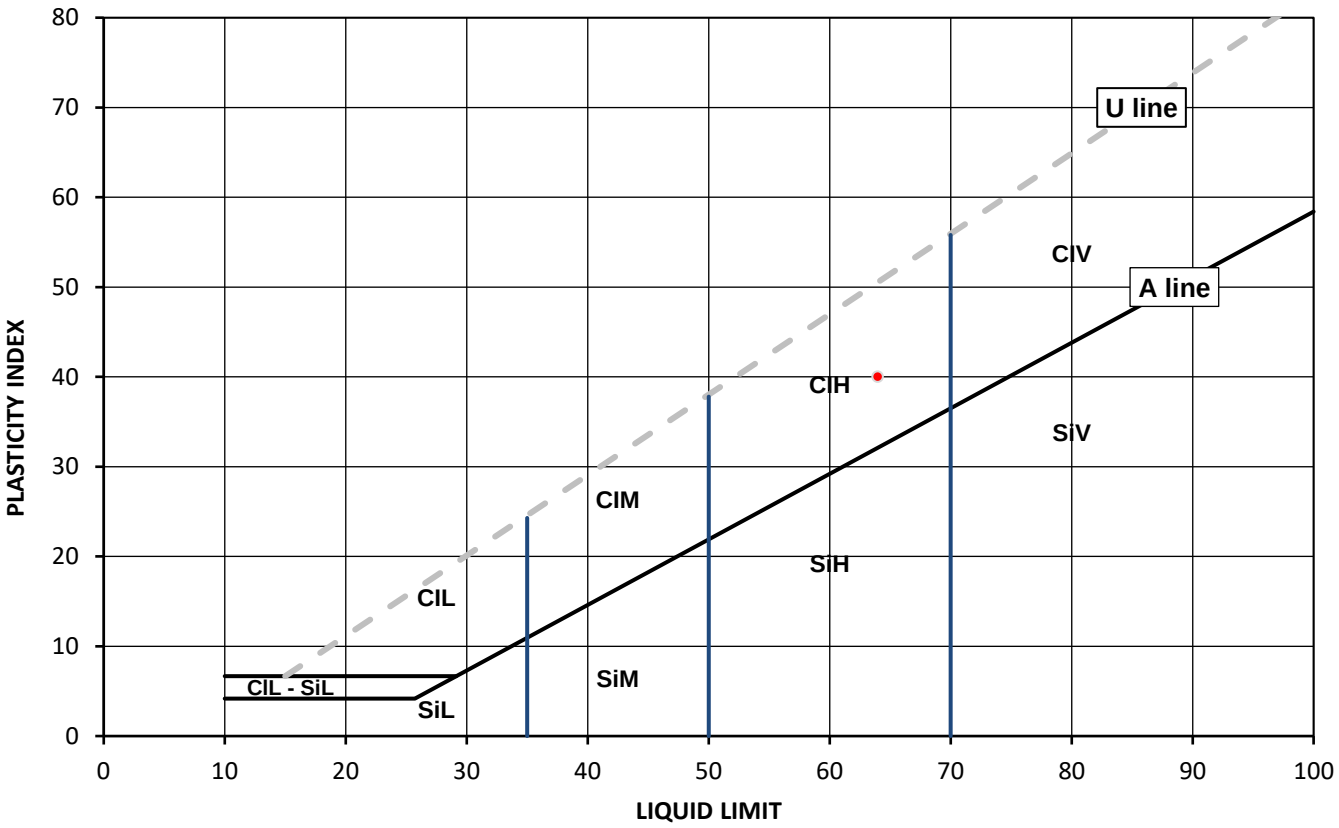
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104838	Depth Top [m]:	2.00
Hole No.:	WS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Multicolour CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	64	24	40	100



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

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

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

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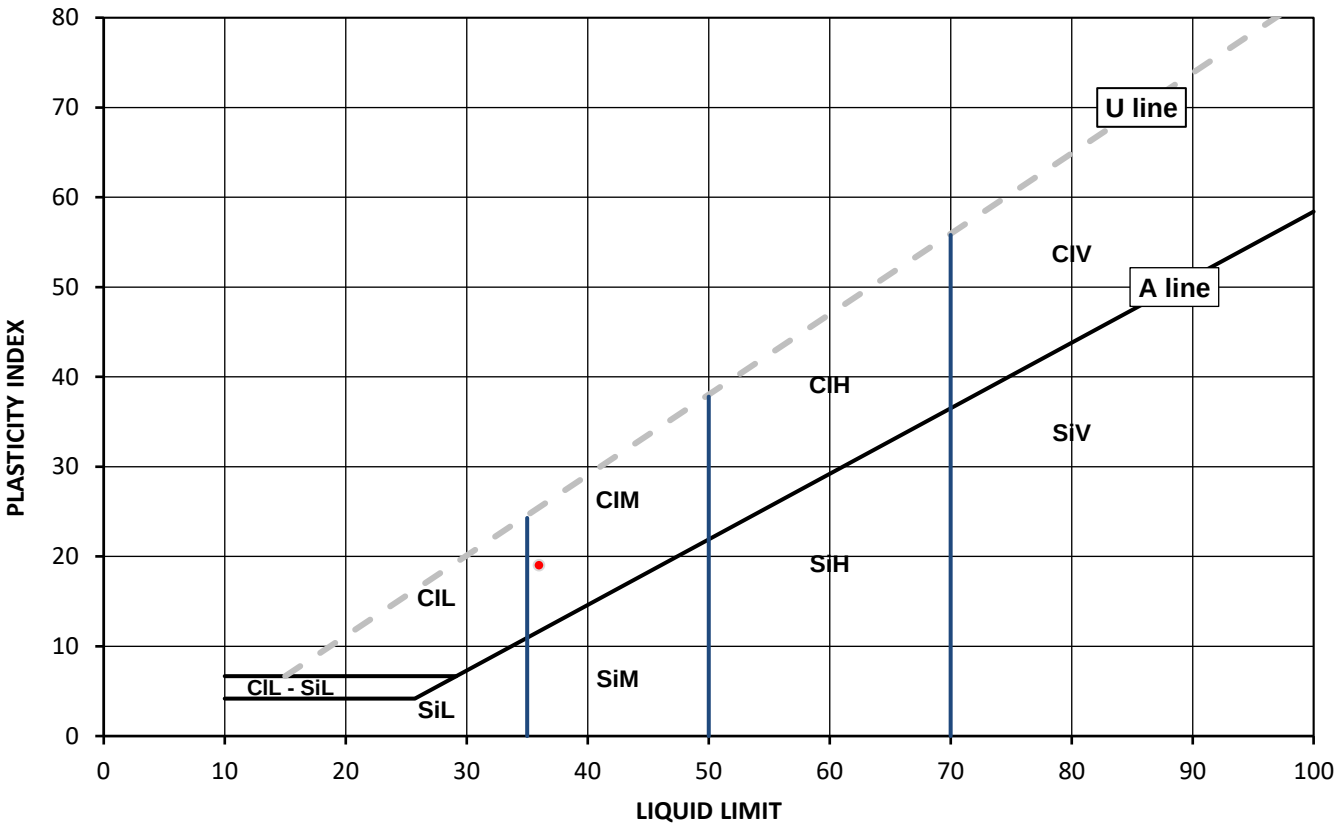
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104839	Depth Top [m]:	1.00
Hole No.:	WS2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Multicolour sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	36	17	19	100



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

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

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

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Northampton NN4 7EB

4041

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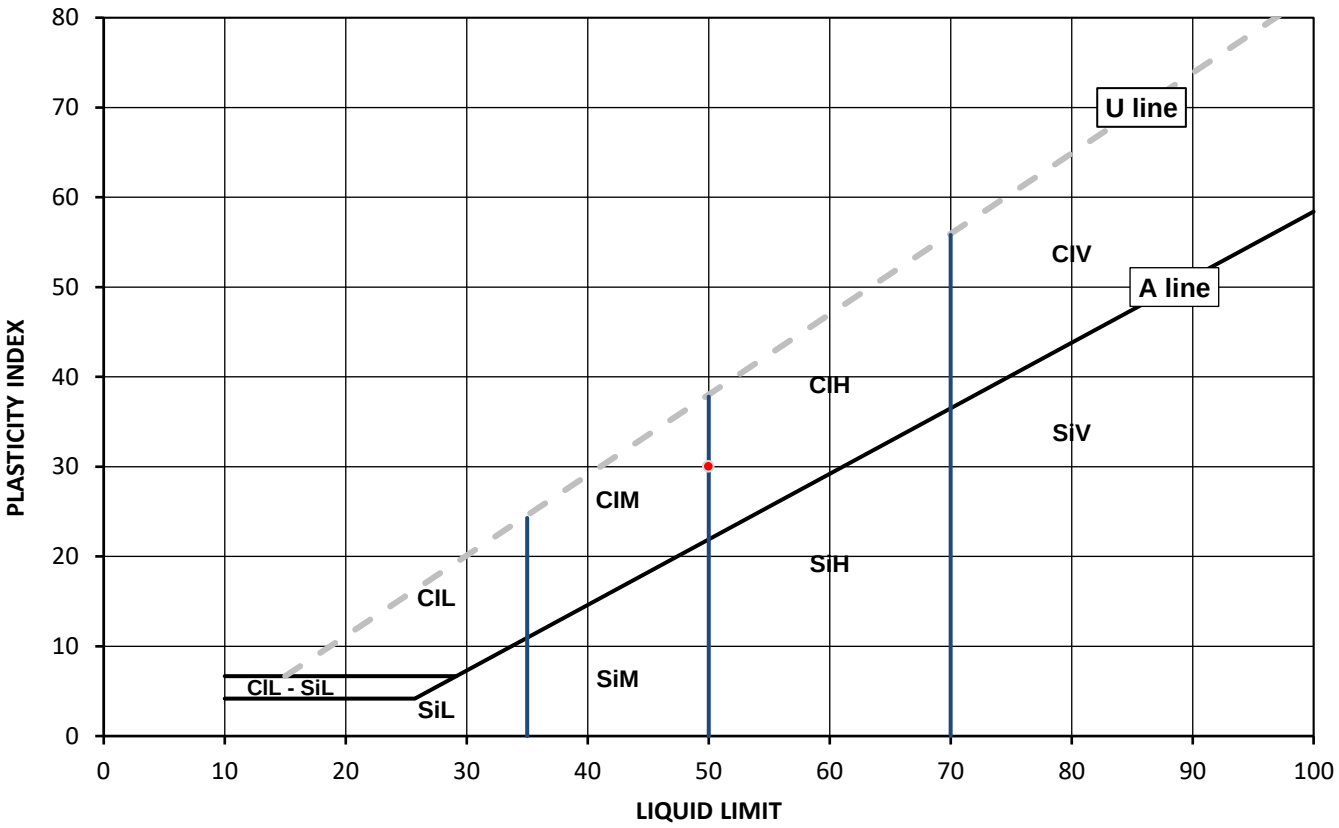
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104840	Depth Top [m]:	2.00
Hole No.:	WS2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Multicolour slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	50	20	30	100



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

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

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

Remarks:

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Northampton NN4 7EB

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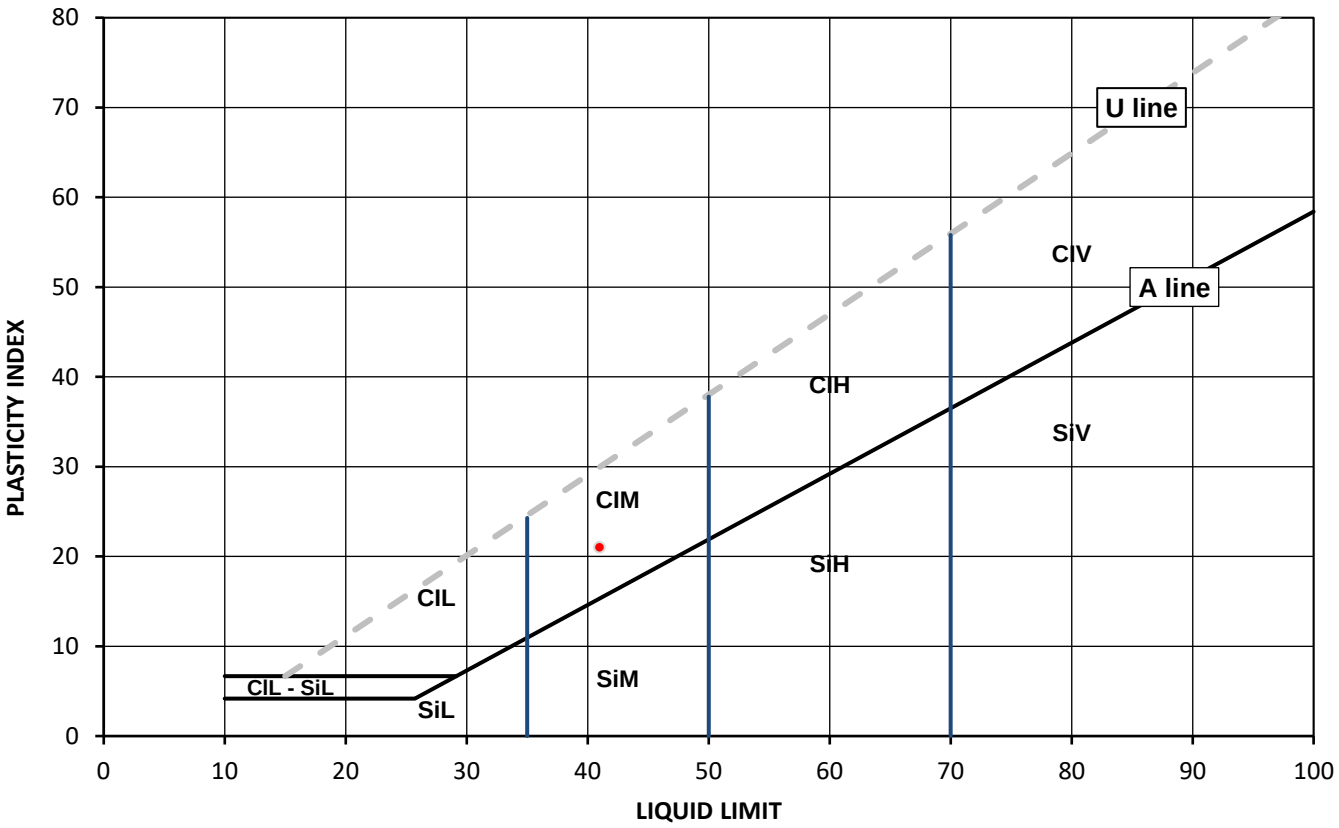
Client:	Enzygo Geoenvironmental Ltd	Client Reference:	CRM.1668.022
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	13/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104841	Depth Top [m]:	0.90
Hole No.:	WS9	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	41	20	21	100



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

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

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

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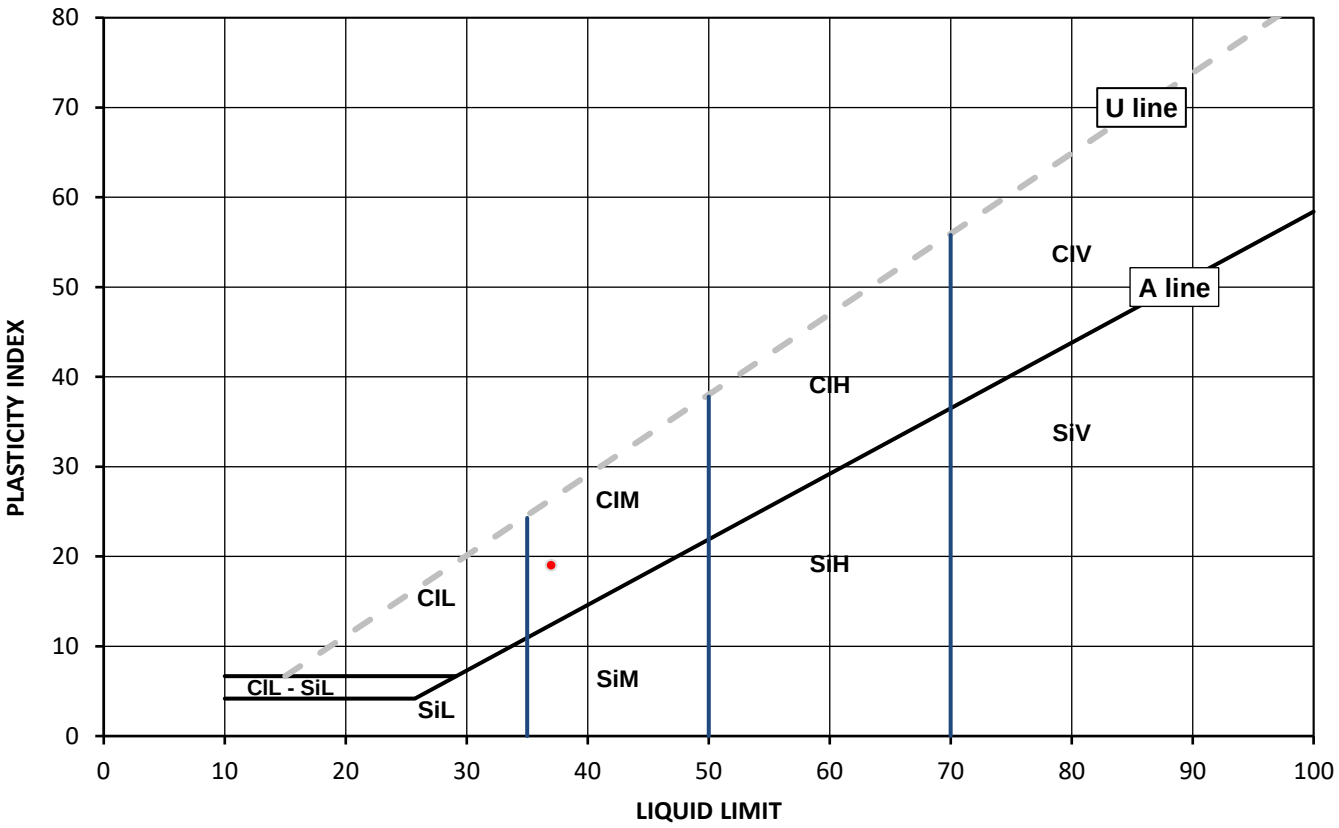
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	17/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104842	Depth Top [m]:	2.00
Hole No.:	WS9	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
28	37	18	19	99



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

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

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

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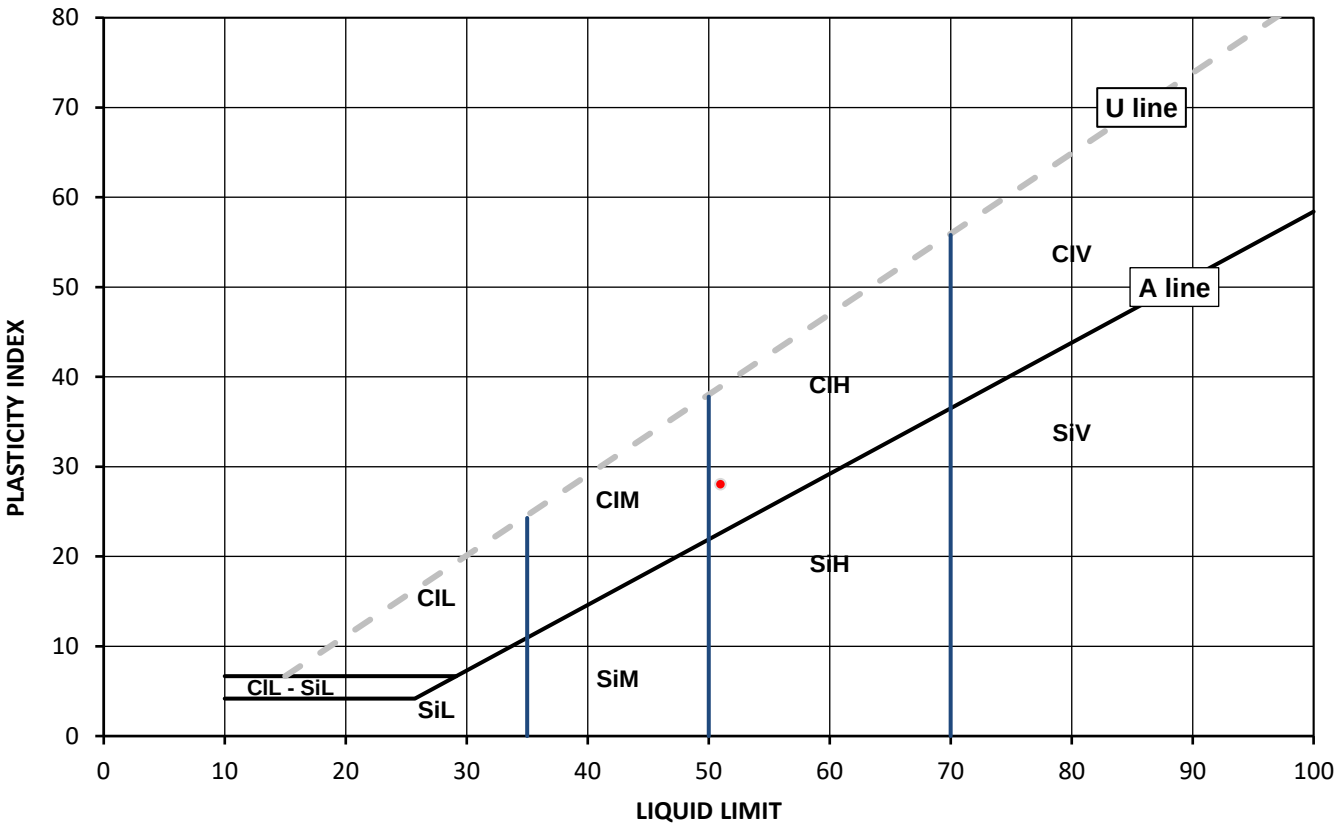
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104843	Depth Top [m]:	1.00
Hole No.:	WS8	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	51	23	28	75



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

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

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

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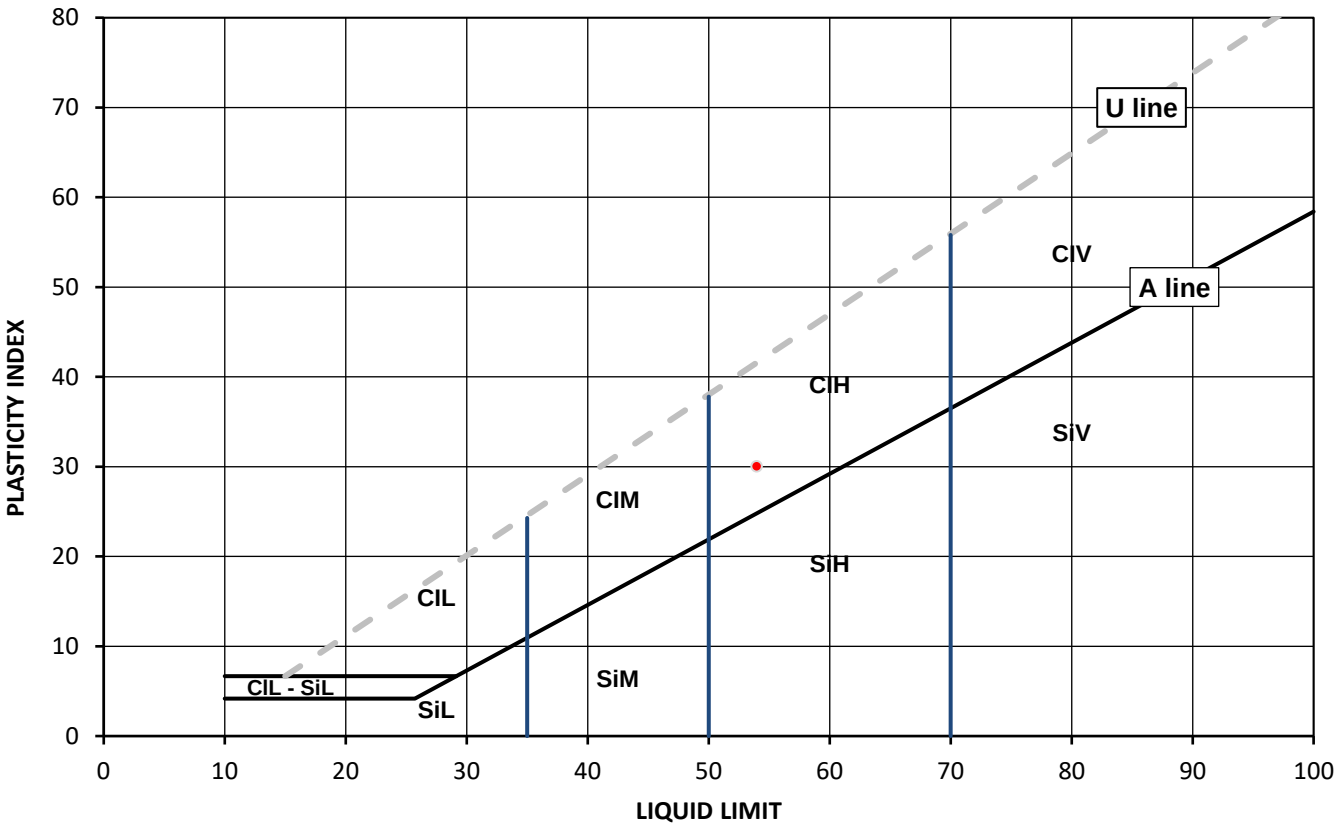
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104844	Depth Top [m]:	2.00
Hole No.:	WS8	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brownish grey slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
50	54	24	30	96



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

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

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

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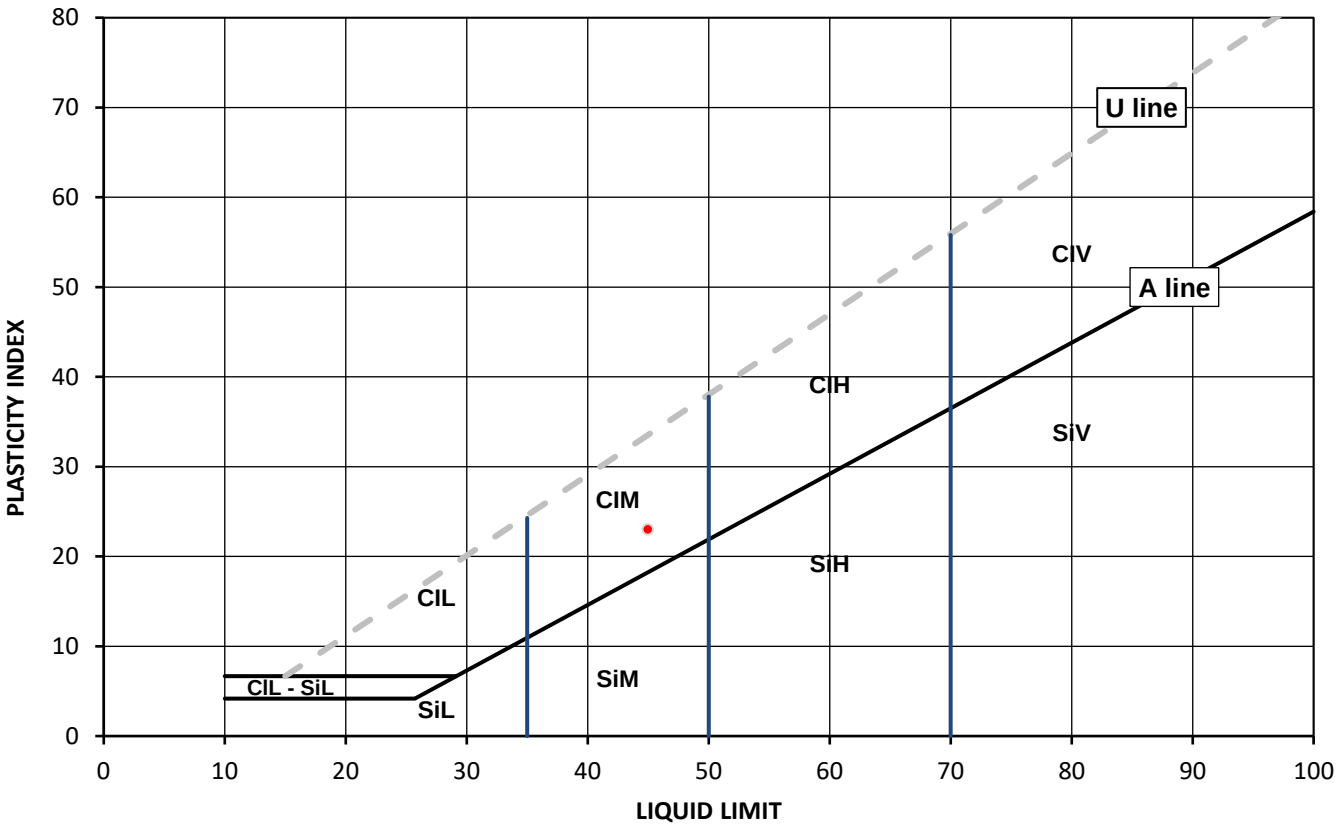
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	16/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104845	Depth Top [m]:	1.00
Hole No.:	WS10	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Multicolour slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
9.0	45	22	23	69



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

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

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

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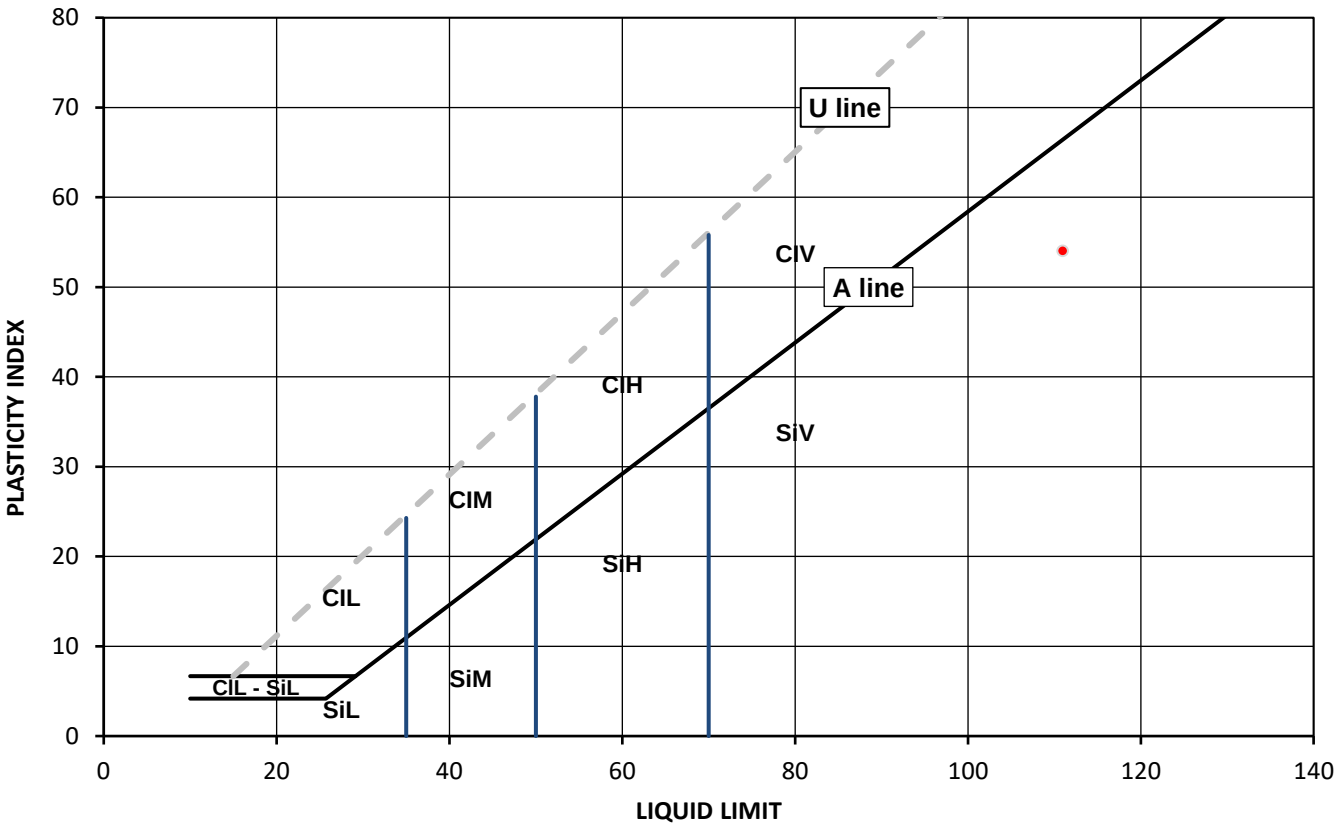
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	17/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

Laboratory Reference:	2104846	Depth Top [m]:	2.00
Hole No.:	WS10	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly organic CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
65	111	57	54	96



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

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

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

Remarks:

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Date Reported: 22/12/2021

GF 232.12

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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

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

4041

Client: Enzygo Geoenvironmental Ltd

Client Address: The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA

Contact: Steve Rhodes

Site Address: Havant

Client Reference: CRM.1668.022

Job Number: 21-26908

Date Sampled: 25/11/2021

Date Received: 01/12/2021

Date Tested: 13/12 - 17/12/2021

Sampled By: Client

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2104837	WS1	Not Given	2.00	Not Given	D	Orangish brown slightly sandy CLAY with fragments of rootlet	Atterberg 1 Point	20		100	47	18	29						
2104845	WS10	Not Given	1.00	Not Given	D	Multicolour slightly gravelly slightly sandy CLAY	Atterberg 1 Point	9.0		69	45	22	23						
2104846	WS10	Not Given	2.00	Not Given	D	Brown slightly gravelly slightly organic CLAY	Atterberg 1 Point	65		96	111	57	54						
2104839	WS2	Not Given	1.00	Not Given	D	Multicolour sandy CLAY	Atterberg 1 Point	19		100	36	17	19						
2104840	WS2	Not Given	2.00	Not Given	D	Multicolour slightly sandy CLAY	Atterberg 1 Point	19		100	50	20	30						
2104838	WS3	Not Given	2.00	Not Given	D	Multicolour CLAY	Atterberg 1 Point	25		100	64	24	40						
2104843	WS8	Not Given	1.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	30		75	51	23	28						
2104844	WS8	Not Given	2.00	Not Given	D	Brownish grey slightly gravelly slightly sandy CLAY	Atterberg 1 Point	50		96	54	24	30						
2104841	WS9	Not Given	0.90	Not Given	D	Brown sandy CLAY	Atterberg 1 Point	24		100	41	20	21						
2104842	WS9	Not Given	2.00	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	28		99	37	18	19						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Deputy Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

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

Date Reported: 22/12/2021

GF 234.14

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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

4041

Client: Enzygo Geoenvironmental Ltd

Client Address: The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA

Contact: Steve Rhodes

Site Address: Havant

Client Reference: CRM.1668.022
Job Number: 21-26908
Date Sampled: 25/11/2021
Date Received: 01/12/2021
Date Tested: 13/12 - 17/12/2021
Sampled By: Client

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2104837	WS1	Not Given	2.00	Not Given	D	Orangish brown slightly sandy CLAY with fragments of rootlet		20	Sample was quartered, oven dried at 106.9 °C			
2104845	WS10	Not Given	1.00	Not Given	D	Multicolour slightly gravelly slightly sandy CLAY		9.0	Sample was quartered, oven dried at 108.9 °C			
2104846	WS10	Not Given	2.00	Not Given	D	Brown slightly gravelly slightly organic CLAY		65	Sample was quartered, oven dried at 108.9 °C			
2104839	WS2	Not Given	1.00	Not Given	D	Multicolour sandy CLAY		19	Sample was quartered, oven dried at 106.9 °C			
2104840	WS2	Not Given	2.00	Not Given	D	Multicolour slightly sandy CLAY		19	Sample was quartered, oven dried at 106.9 °C			
2104838	WS3	Not Given	2.00	Not Given	D	Multicolour CLAY		25	Sample was quartered, oven dried at 106.9 °C			
2104843	WS8	Not Given	1.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY		30	Sample was quartered, oven dried at 106.9 °C			
2104844	WS8	Not Given	2.00	Not Given	D	Brownish grey slightly gravelly slightly sandy CLAY		50	Sample was quartered, oven dried at 106.9 °C			
2104841	WS9	Not Given	0.90	Not Given	D	Brown sandy CLAY		24	Sample was quartered, oven dried at 106.3 °C			
2104842	WS9	Not Given	2.00	Not Given	D	Brown slightly gravelly sandy CLAY		28	Sample was quartered, oven dried at 108.9 °C			

Comments:

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Monika Janoszek
PL Deputy Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 22/12/2021

GF 099.16

TEST CERTIFICATE

California Bearing Ratio Top Only

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

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	CRM.1668.022
Client Address:	The Byre, Woodend Lane, Cromhall, Gloucestershire, GL12 8AA	Job Number:	21-26908
		Date Sampled:	25/11/2021
		Date Received:	01/12/2021
Contact:	Steve Rhodes	Date Tested:	20/12/2021
Site Address:	Havant	Sampled By:	Client

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

Test Results:

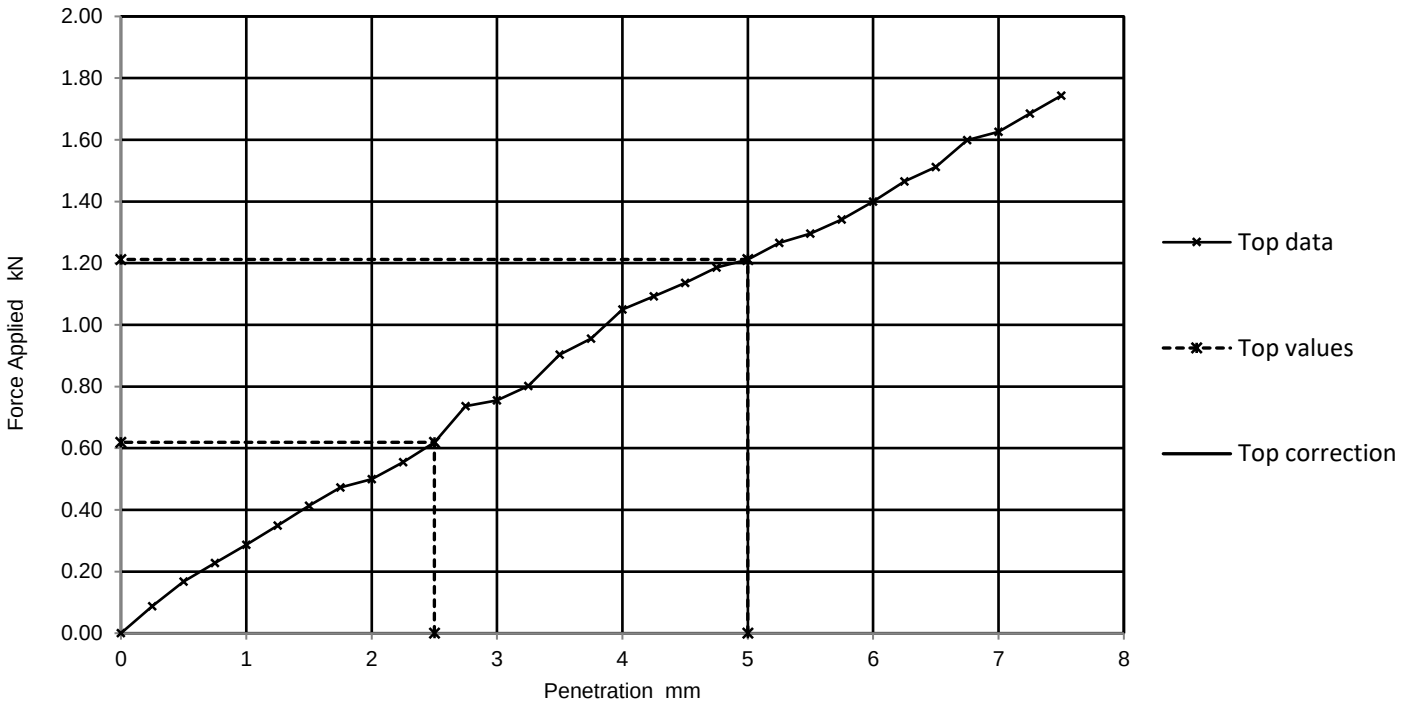
Laboratory Reference:	2104841	Depth Top [m]:	0.90
Hole No.:	WS9	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown sandy CLAY		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	9 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.96	Mg/m3	Surcharge applied	8	kg
	Dry density	1.59	Mg/m3		4.8	kPa
	Moisture content	23	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	4.7	6.1	6.1	N/A	25

Remarks:

Test/ Specimen specific remarks:

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Signed:

Monika Janoszek
PL Deputy Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 22/12/2021

GF 277.8

Steve Rhodes
Enzygo Geoenvironmental Ltd
The Byre
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

e: steve.rhodes@enzygo.com

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

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

Analytical Report Number : 21-26910

Project / Site name:	Havant	**Samples received on:**	01/12/2021
Your job number:	CRM.1668.022	**Samples instructed on/ Analysis started on:**	01/12/2021
Your order number:		**Analysis completed by:**	15/12/2021
Report Issue Number:	1	**Report issued on:**	21/12/2021
Samples Analysed:	6 soil samples		

Signed:

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

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

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

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 21-26910
Project / Site name: Havant

Lab Sample Number				2104850	2104851	2104852	2104853	2104854
Sample Reference				WS3	WS8	WS8	WS8	WS11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	1.00	2.00	3.00	2.00
Date Sampled				25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	35	< 0.1
Moisture Content	%	0.01	NONE	18	20	26	29	19
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50	1.1	1.1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	7.9	7.3	6.8	8.1
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	610	240	91	87	320
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.31	0.12	0.046	0.044	0.16
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	306	121	45.5	43.6	160

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

Analytical Report Number: 21-26910
Project / Site name: Havant

Lab Sample Number				2105598
Sample Reference				WS11
Sample Number				None Supplied
Depth (m)				1.20
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	11
Total mass of sample received	kg	0.001	NONE	1.1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-

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

Analytical Report Number : 21-26910
Project / Site name: Havant

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2104850	WS3	None Supplied	2	Brown clay.
2104851	WS8	None Supplied	1	Brown clay and sand with gravel.
2104852	WS8	None Supplied	2	Brown clay and loam with gravel and vegetation.
2104853	WS8	None Supplied	3	Brown clay and loam with gravel and stones.
2104854	WS11	None Supplied	2	Brown clay and loam with gravel.
2105598	WS11	None Supplied	1.2	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-26910
Project / Site name: Havant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Analytical Report Number : 21-26910
Project / Site name: Havant

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS11	None Supplied	S	2105598	a	None Supplied	None Supplied	None Supplied

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The results included within the report are representative of the samples submitted for analysis.

Appendix 5 - Human Health Assessment Reference Values

Determinant	Units	GAC Value Residential					
		With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40		
Cadmium	mg/kg	11			85		
Chromium	mg/kg	910			910		
Chromium VI	mg/kg	6			6		
Lead	mg/kg	200			310		
Mercury	mg/kg	40			56		
Nickel	mg/kg	130			180		
Selenium	mg/kg	250			430		
Copper	mg/kg	2400			7100		
Zinc	mg/kg	3700			40000		
Cyanide	mg/kg	791			800		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	120	200	380	440	690	1200
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000
Flourene	mg/kg	170	400	860	2800	3800	4500
Phenanthrene	mg/kg	95	220	440	1300	1500	1500
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000
Fluoranthene	mg/kg	280	560	890	1500	1600	1600
Pyrene	mg/kg	620	1200	2000	3700	3800	3800
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15
Chrysene	mg/kg	15	22	27	30	31	32
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360
TPH C_5-C_6 Aliphatic	mg/kg	**42**	**78**	**160**	**42**	**78**	**160**
TPH C_6-C_8 Aliphatic	mg/kg	**100**	**230**	**530**	**100**	**230**	**530**
TPH C_8-C_{10} Aliphatic	mg/kg	**27**	**65**	**150**	**27**	**65**	**150**
TPH C_{10}-C_{12} Aliphatic	mg/kg	130	330	760	**130**	**330**	**770**
TPH C_{12}-C_{16} Aliphatic	mg/kg	1100	2400	4300	**1100**	2400	4400
TPH C_{16}-C_{35} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_{35}-C_{44} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_5-C_7 Aromatic	mg/kg	70	140	300	370	690	1400
TPH C_7-C_8 Aromatic	mg/kg	130	290	660	860	1800	3900
TPH C_8-C_{10} Aromatic	mg/kg	34	83	190	47	110	270
TPH C_{10}-C_{12} Aromatic	mg/kg	**74**	**180**	**380**	250	590	1200
TPH C_{12}-C_{16} Aromatic	mg/kg	**140**	**330**	**660**	1800	**2300**	**2500**
TPH C_{16}-C_{21} Aromatic	mg/kg	**260**	**540**	**930**	**1900**	**1900**	**1900**
TPH C_{21}-C_{35} Aromatic	mg/kg	**1100**	**1500**	**1700**	**1900**	**1900**	**1900**
TPH C_{35}-C_{44} Aromatic	mg/kg	**1100**	**1500**	**1700**	**1900**	**1900**	**1900**
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.70	1.4
Toluene	mg/kg	130	290	660	880	1900	3900
Ethylebenzene	mg/kg	47	110	260	83	190	440
Xylene	mg/kg	56	130	310	79	180	430

Determinant	Units	GAC Value					
		Residential POS			Commercial		
Arsenic	mg/kg	79			640		
Cadmium	mg/kg	120			190		
Chromium	mg/kg	1500			8600		
Chromium VI	mg/kg	7.7			33		
Lead	mg/kg	630			2330		
Mercury	mg/kg	120			1100		
Nickel	mg/kg	230			980		
Selenium	mg/kg	1100			12000		
Copper	mg/kg	12000			68000		
Zinc	mg/kg	81000			730000		
Cyanide	mg/kg	N/A			16200		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	440	690	1300	440	690	1300
Napthalene	mg/kg	4900	4900	4900	190	460	1100
Acenaphtylene	mg/kg	15000	15000	15000	83000	97000	100000
Acenaphthene	mg/kg	15000	15000	15000	84000	97000	100000
Flourene	mg/kg	9900	9900	9900	63000	68000	71000
Phenanthrene	mg/kg	3100	3100	3100	22000	22000	23000
Anthracene	mg/kg	74000	74000	74000	520000	540000	540000
Fluoranthene	mg/kg	3100	3100	3100	23000	23000	23000
Pyrene	mg/kg	7400	7400	7400	54000	54000	54000
Benzo(a)Anthracene	mg/kg	29	29	29	170	170	180
Chrysene	mg/kg	57	57	57	350	350	350
Benzo(b)Flouranthene	mg/kg	7.1	7.2	7.2	44	44	45
Benzo(k)Flouranthene	mg/kg	190	190	190	1200	1200	1200
Benzo(a)Pyrene	mg/kg	5.7	5.7	5.7	35	35	36
Indeno(123-cd)Pyrene	mg/kg	82	82	82	500	510	510
Dibenzo(a,h)Anthracene	mg/kg	0.57	0.57	0.58	3.5	3.6	3.6
Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C_5-C_6 Aliphatic	mg/kg	570000	590000	600000	**3200**	**5900**	**12000**
TPH C_6-C_8 Aliphatic	mg/kg	600000	610000	620000	**7800**	**17000**	**40000**
TPH C_8-C_{10} Aliphatic	mg/kg	13000	13000	13000	**2000**	**4800**	**11000**
TPH C_{10}-C_{12} Aliphatic	mg/kg	13000	13000	13000	**9700**	**23000**	47000
TPH C_{12}-C_{16} Aliphatic	mg/kg	13000	13000	13000	59000	82000	90000
TPH C_{16}-C_{35} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_{35}-C_{44} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_5-C_7 Aromatic	mg/kg	**56000**	**56000**	**56000**	26000	46000	86000
TPH C_7-C_8 Aromatic	mg/kg	**56000**	**56000**	**56000**	56000	110000	180000
TPH C_8-C_{10} Aromatic	mg/kg	**5000**	**5000**	**5000**	3500	8100	17000
TPH C_{10}-C_{12} Aromatic	mg/kg	**5000**	**5000**	**5000**	16000	28000	**34000**
TPH C_{12}-C_{16} Aromatic	mg/kg	**5100**	**5100**	**5000**	**36000**	**37000**	**38000**
TPH C_{16}-C_{21} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
TPH C_{21}-C_{35} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
TPH C_{35}-C_{44} Aromatic	mg/kg	**3800**	**3800**	**3800**	**28000**	**28000**	**28000**
Benzene	mg/kg	72	72	73	27	47	90
Toluene	mg/kg	56000	56000	56000	56000	110000	180000
Ethylebenzene	mg/kg	24000	24000	25000	5700	13000	27000
Xylene	mg/kg	41000	42000	43000	5900	14000	30000

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Determinant	Units	GAC Value					
		Park POS			Allotments		
Arsenic	mg/kg	170			43		
Cadmium	mg/kg	532			1.9		
Chromium	mg/kg	33000			18000		
Chromium VI	mg/kg	220			1.8		
Lead	mg/kg	1300			80		
Mercury	mg/kg	240			19		
Nickel	mg/kg	3400			230		
Selenium	mg/kg	1800			88		
Copper	mg/kg	44000			520		
Zinc	mg/kg	170000			620		
Cyanide	mg/kg						
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	440	690	1300	23	42	83
Napthalene	mg/kg	1200	1900	3000	4.1	10	24
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160
Acenaphthene	mg/kg	29000	30000	30000	34	85	200
Flourene	mg/kg	20000	20000	20000	27	67	160
Phenanthrene	mg/kg	6200	6200	6300	15	38	90
Anthracene	mg/kg	150000	150000	150000	380	950	2200
Fluoranthene	mg/kg	6300	6300	6400	52	130	290
Pyrene	mg/kg	15000	15000	15000	110	270	620
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13
Chrysene	mg/kg	93	110	120	4.1	9.4	19
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640
TPH C_5-C_6 Aliphatic	mg/kg	95000	130000	180000	730	1700	3900
TPH C_6-C_8 Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000
TPH C_8-C_{10} Aliphatic	mg/kg	14000	18000	21000	320	770	1700
TPH C_{10}-C_{12} Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300
TPH C_{12}-C_{16} Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000
TPH C_{16}-C_{35} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_{35}-C_{44} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_5-C_7 Aromatic	mg/kg	**76000**	**84000**	**92000**	**13**	**27**	**57**
TPH C_7-C_8 Aromatic	mg/kg	**87000**	**95000**	**100000**	**22**	**51**	**120**
TPH C_8-C_{10} Aromatic	mg/kg	**7200**	**8500**	**9300**	**8.6**	**21**	**51**
TPH C_{10}-C_{12} Aromatic	mg/kg	**9200**	**9700**	**10000**	**13**	**31**	**74**
TPH C_{12}-C_{16} Aromatic	mg/kg	**10000**	**10000**	**10000**	**23**	**57**	**130**
TPH C_{16}-C_{21} Aromatic	mg/kg	**7600**	**7700**	**7800**	**46**	**110**	**260**
TPH C_{21}-C_{35} Aromatic	mg/kg	**7800**	**7800**	**7900**	**370**	**820**	**1600**
TPH C_{35}-C_{44} Aromatic	mg/kg	**7800**	**7800**	**7900**	**370**	**820**	**1600**
Benzene	mg/kg	90	100	110	0.017	0.034	0.075
Toluene	mg/kg	87000	95000	100000	22	51	120
Ethylebenzene	mg/kg	17000	22000	27000	16	39	91
Xylene	mg/kg	17000	23000	31000	28	67	160

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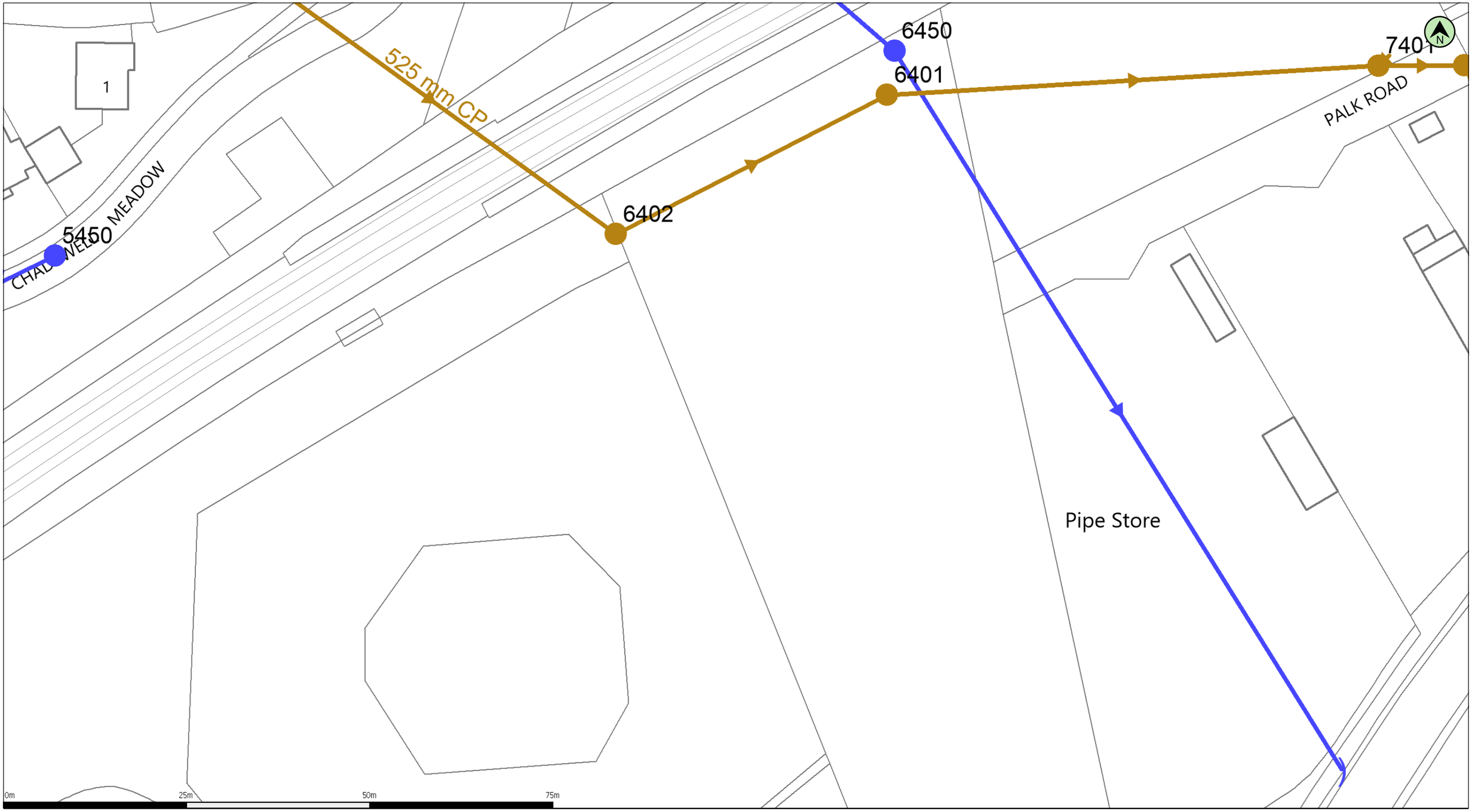
Appendix D



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The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2021 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

wendy.turner@t-d-s.com

TDSSW 400

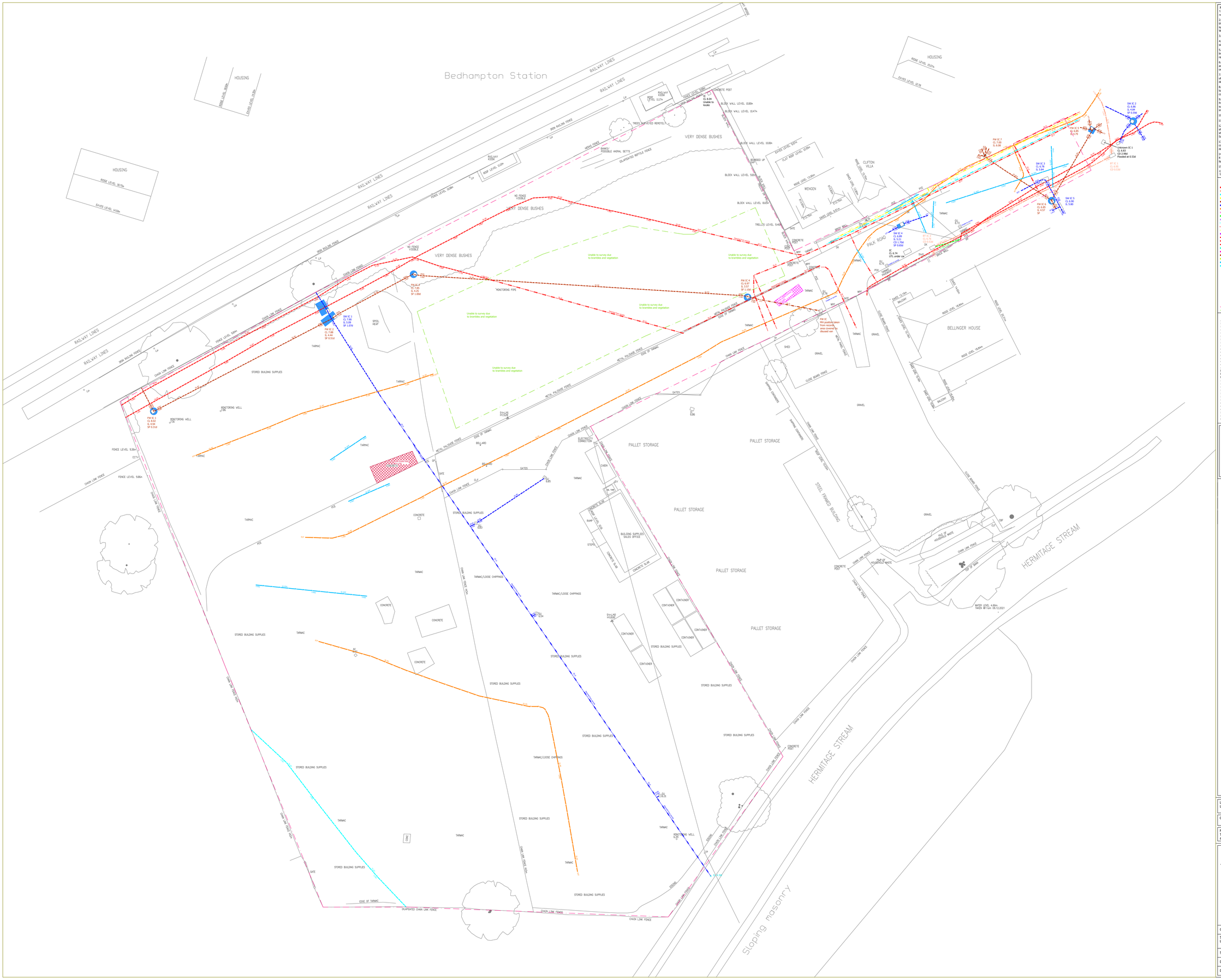
WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
6401	F	7.84	0.00	
6402	F	0.00	0.00	
7401	F	6.93	3.48	
7402	F	6.78	0.00	
5450	S	7.85	6.68	
6450	S	7.85	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix E



NOTES:

1. The base topographical survey has been supplied by the client and has not been checked for accuracy.

2. A number of technologies were used to obtain the information shown on this drawing. Varying ground conditions can affect the performance of these systems, therefore 100% detection is not guaranteed. Always Exercise Caution When Excavating.

3. This line types represent assumed utility positions (as annotated).

4. Where electric & metallic services are illustrated on this drawing as a single utility line, these may represent multiple pipes/cables.

5. Possible radar targets show the position of suspected underground linear features, these features have produced an inconsistent response to the radar.

6. It is not always possible to differentiate between construction features and pipes, it is therefore possible that some of the features shown are not pipes or cables.

7. Every care has been taken to ensure the correct identification of the utility types, however these should be independently verified prior to use in any design/ building works.

8. All pipe diameters and levels are assumed to be correct, however due to non entry to inspection chambers, these should be verified before any works commence.

9. Depths shown with the suffix (RD) have been measured using radio frequency locators and are to the centre of pipes/cables. Depths shown with the suffix (S) have been measured to a radio frequency sewer sonde and are to the invert of pipes. Therefore these depths are indicative only.

10. All utility depths are in metres unless otherwise stated

11. All pipe/duct sizes are in millimetres unless otherwise stated

12. Information provided should not be altered or modified in any way. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of Encompass Surveys.

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15. Scale indicated is only applicable when plotted at sheet size

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LINE-TYPE KEY

- Electricity
- British Telecom
- Water
- Gas
- Foul Water
- Storm Water
- Metallic
- Telecom
- Empty Duct
- Mercury Comms
- Water Records
- Electricity Records
- Gas Records
- Low Voltage
- 11Kv High Voltage
- 33Kv High Voltage
- Fuel Pipe
- Hot Water
- Combined Sewer
- Traffic Control Signalling
- Strong Radar Target
- Weak Radar Target
- GPR Detected Anomaly
- GPR Detected Reinforcing
- Extents of Chamber
- Scan Area
- Unable to Scan Area

ABBREVIATIONS

AV	Air Valve	IRS	Illuminated Road Sign
BB	Belisha Beacon	LP	Lamp Post
BCD	Bottom of Chamber Depth	MH	Manhole
BH	Borehole	MKR	Marker
BL	Bollard Light	MW	Monitoring Well
BM	Bench Mark	Pole	Pole
BO	Bollard	PE	Polyethylene
BS	Bus Stop	RE	Rodding Eye
BT	British Telecom Cover	RG	Rain Gully
CAB	Cabinet	RS	Road Sign
CATV	Cable Television Cover	S	Spot
CCTV	Closed Circuit TV	SI	Spoil Iron
CD	Chamber Depth	SP	Sign Post
CL	Cover Level	ST	Steel
CO	Concrete (Pre-Cast)	STN	Survey Station
DI	Ductile Iron	SV	Stop Valve
DP	Down Pipe	SWCH	Surface Water Catch Pit
EJB	Electricity Junction Box	SWSA	Surface Water Soak Away
EOT	End Of Trace	SW	Surface Water
EP	Electricity Pole	TCB	Telephone Call Box
ER	Earth Rod	TCD	Top of Chamber Depth
FB	Flower Bed	TL	Telephone Line
FR	Fire Hydrant	TLCB	Traffic Light Control Box
FL	Floor Level	TP	Telegraph Pole
FW	Foul Water	UTL	Unable To Lift
FWP	Foul Water Pipe	UTT	Unable To Trace
GM	Gas Meter	VP	Vent Pipe
GP	Gas Pipe	WLD	Water Level Depth
GV	Gas Valve	WM	Water Meter
IC	Inspection Cover	WSC	Water Stop Cock
ID	Invert Depth	WSV	Water Stop Valve
IL	Invert Level	WWO	Water Wash Out

Drawing orientation

Level Datum:
Levels are related to a previous survey supplied by the client

Grid:

Northpoint:
The Northpoint position shown on this drawing has been located as accurately as possible, but is only indicative of true North

ENCOMPASS SURVEYS

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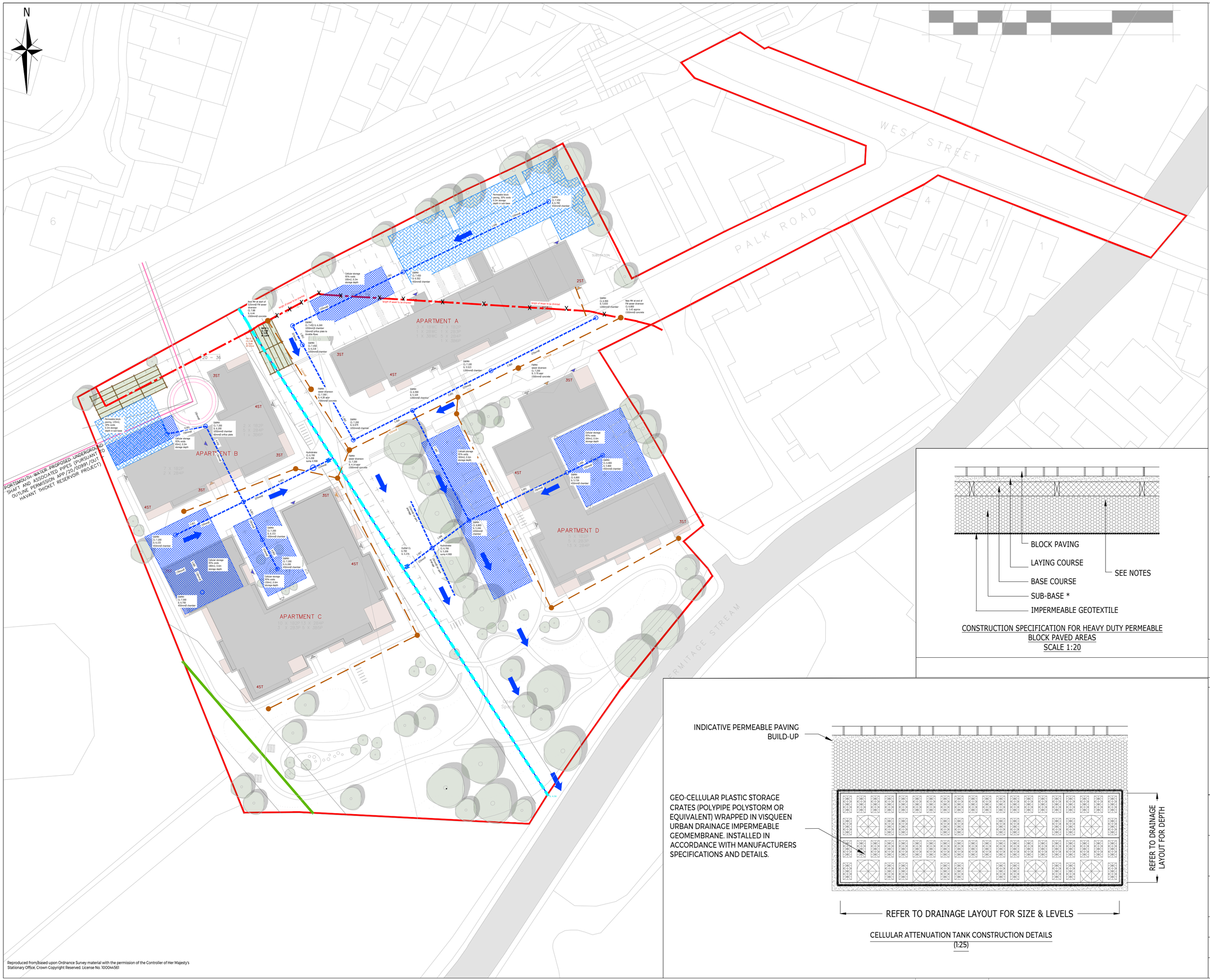
Client:	Bellway Homes		
Survey Location:	Paulk Road Havant Hampshire		
Survey type:	Utility	Scale:	1:200 @ A0
Drawing ref:	ENC/040722/2284U1	Date:	July 22
Drawn/QA:	DS	Plots:	1 of 1

Appendix F



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES, UNLESS OTHERWISE STATED.
4. DRAWING BASED ON PROPOSED SITE LAYOUT PLAN, DRAWING NUMBER 21085 - 101 - Proposed Site Layout BY AD, DATED NOV 2022
5. TOPOGRAPHICAL SURVEY BY DORSET LAND SURVEYING, DRAWING NUMBER 7726, DATED 10.21.2021.
6. PREDICTED FLOOD EXTENTS WERE MODELLED BY ARDENT CONSULTING ENGINEERS. THE FLOOD MODELLED WAS A 1 IN 100 YR EVENT WITH A 37% ACCOUNTING FOR CLIMATE CHANGE.
7. THE MINIMUM FINISHED FLOOR LEVEL SHOULD BE SET AT 6.93mAOD.
8. AREAS WITHIN THE PREDICTED FLOOD EXTENTS AND THE PROPOSED DEVELOPMENT BOUNDARY TO REMAIN AT EXISTING LEVELS .

PERMEABLE PAVING NOTES

HEAVY DUTY: TO BE USED FOR *ALL* SHARED DRIVES, PARKING COURTS AND PRIVATE ACCESS ROADS

* THE FORMATION OF THE PERMEABLE PAVING SUB-BASE MUST NOT EXCEED A GRADIENT OF 1/40.

FOR STEEPER GRADIENTS, USE MAXIMUM GRADIENT OF 1/40 FOR FORMATION, APPLYING VERTICAL STEPS AS NECESSARY, BUT ENSURING MINIMUM SUB-BASE THICKNESS IS ALWAYS ACHIEVED.

PERMEABLE PAVING CONSTRUCTION SPECIFIED ABOVE IS SUITABLE FOR CBR VALUES OF BETWEEN 2% & 5%. FOR CBR VALUES OUTSIDE OF THIS RANGE, REFER BACK TO THE ENGINEER FOR CLARIFICATION.

ALL MATERIAL SPECIFICATION AND WORKMANSHIP OF PERMEABLE PAVING CONSTRUCTION TO BE STRICTLY IN ACCORDANCE WITH RECOMMENDATIONS BY MARSHALLS.

CONSTRUCTION SPECIFICATION FOR HEAVY DUTY PERMEABLE BLOCK PAVED AREAS
SCALE 1:20

KEY

- SITE BOUNDARY
- INDICATIVE FOUL WATER SEWER
- INDICATIVE SURFACE WATER SEWER
- INDICATIVE PERMEABLE PAVING (30% VOIDS)
- INDICATIVE ATTENUATION TANK (95% VOIDS)
- EXISTING SOUTHERN WATER SURFACE WATER SEWER
- EXISTING SOUTHERN WATER FOUL SEWER
- EXISTING SOUTHERN WATER FOUL SEWER TO BE ABANDONED
- HYDROBRAKE FLOW CONTROL STRUCTURE
- NON-RETURN VALVE
- 1 IN 100 YEAR + 37% CC FLUVIAL FLOOD EXTENT
- EXCEEDANCE FLOW ROUTES

CELLULAR ATTENUATION TANK CONSTRUCTION DETAILS
(1:25)

Rev	Description	Drn	Chk	App	Date

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E-mail: enquiries@ardent-ce.co.uk

Client
BELLWAY HOMES (WESSEX)

Project Title:
LAND AT PALK ROAD, HAVANT

Drawing Title:
FOUL AND SURFACE WATER DRAINAGE STRATEGY

A2 Scale	Date	Designed by
1:500	DEC 22	TD
Drawn by	Checked by	Approved by
FH	CC	BC

Drawing Number: 2108040-001 — Rev: -

Appendix G

EXISTING SURFACE WATER

Existing site information:

Site Boundary Area	13000	m2
Developable Area	1.3	ha
Impermeable Area	1.1000	ha

Modified Rational Method Equation:

$$Q_n = 2.78\ CiA$$

where:

C	*Runoff Coeffic =*	1 (in this case 1 as using impermeable area)
i_n	*Rainfall Intensity for n return period (mm/hr)*	
A	*Impermeable Area (Ha)*	
Q_n	*Runoff for n return period (l/s)*	

Rainfall Intensity:

The rainfall intensities for various return periods were extracted from Table 1(a) of the Transport and Road Research Laboratory Report - Estimated rainfall for drainage calculations in the United Kingdom (TRRL Report LR 595) by C. P. Young. For the 5 min duration.

i_1	50.8	mm/hr
i_{30}	113.02	mm/hr
i_{100}	143.9	mm/hr

Existing Surface Water Runoff:

Therefore:

			C		i_n		*A*		Q_n	
Q_1	2.78	x	1	x	50.8	x	1.1	=	**155.35**	**l/s**
Q_{30}	2.78	x	1	x	113.0	x	1.1	=	**345.62**	**l/s**
Q_{100}	2.78	x	1	x	143.9	x	1.1	=	**440.05**	**l/s**

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 736 Urban 0.000
Area (ha) 1.000 Soil 0.400 Region Number Region 7

Results	**l/s**
QBAR Rural	3.6
QBAR Urban	3.6
Q100 years	11.5
Q1 year	3.1
Q30 years	8.2
Q100 years	11.5

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Appendix H

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.400	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	0.600
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	29.652	0.198	149.8	0.040	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	23.636	0.158	149.6	0.055	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	7.680	0.051	150.6	0.056	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	20.786	0.139	149.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	14.792	0.099	149.4	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	25.370	0.127	199.8	0.025	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	23.816	0.119	200.1	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	24.753	0.083	298.2	0.049	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.60	6.700	0.040	0.0	0.0	0.0	0.82	14.5	5.4
1.001	50.00	6.08	6.502	0.095	0.0	0.0	0.0	0.82	14.5	12.9
1.002	50.00	6.20	6.269	0.151	0.0	0.0	0.0	1.06	42.3	20.4
1.003	50.00	6.53	6.218	0.151	0.0	0.0	0.0	1.07	42.4	20.4
1.004	50.00	6.76	6.079	0.193	0.0	0.0	0.0	1.07	42.4	26.2
2.000	50.00	5.46	5.650	0.025	0.0	0.0	0.0	0.92	36.6	3.4
2.001	50.00	5.89	5.523	0.064	0.0	0.0	0.0	0.92	36.6	8.6
1.005	50.00	7.22	5.329	0.306	0.0	0.0	0.0	0.91	64.0	41.4

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
3.000	9.201	0.061	150.8	0.068	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	23.788	0.543	43.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	11.396	0.038	299.9	0.096	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	4.505	0.030	150.2	0.067	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	16.707	0.111	150.5	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	6.721	0.045	149.4	0.033	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.002	17.491	0.162	108.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.000	6.742	0.045	149.8	0.030	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	6.742	0.117	57.6	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	7.121	0.047	151.5	0.101	5.00	0.0	0.600	o	150	Pipe/Conduit	
6.001	7.121	0.115	61.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.003	16.143	0.108	149.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.004	4.972	0.033	150.4	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.000	50.00	5.19	5.800	0.068	0.0	0.0	0.0	0.82	14.4	9.3
3.001	50.00	5.45	5.739	0.068	0.0	0.0	0.0	1.52	26.9	9.3
1.006	50.00	7.43	5.246	0.471	0.0	0.0	0.0	0.90	63.8	63.8
1.007	50.00	7.50	5.208	0.537	0.0	0.0	0.0	1.06	42.3«	72.8
4.000	50.00	5.34	6.700	0.035	0.0	0.0	0.0	0.82	14.4	4.8
4.001	50.00	5.48	6.500	0.068	0.0	0.0	0.0	0.82	14.5	9.2
4.002	50.00	5.78	6.200	0.068	0.0	0.0	0.0	0.97	17.1	9.2
5.000	50.00	5.14	6.200	0.030	0.0	0.0	0.0	0.82	14.5	4.1
5.001	50.00	5.22	6.155	0.050	0.0	0.0	0.0	1.33	23.5	6.7
6.000	50.00	5.15	6.200	0.101	0.0	0.0	0.0	0.81	14.4	13.7
6.001	50.00	5.24	6.153	0.101	0.0	0.0	0.0	1.28	22.6	13.7
4.003	50.00	6.03	5.963	0.219	0.0	0.0	0.0	1.07	42.4	29.6
4.004	50.00	6.11	5.855	0.247	0.0	0.0	0.0	1.06	42.3	33.4

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.007		6.700	5.178	0.000	0	0

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
4.004		7.200	5.822	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	7
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.400	Storm Duration (mins)	30
Ratio R	0.350		

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Online Controls for Storm

Orifice Manhole: 15, DS/PN: 1.002, Volume (m³): 1.7

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 6.269

Hydro-Brake® Optimum Manhole: 20, DS/PN: 1.007, Volume (m³): 2.4

Unit Reference	MD-SHE-0119-7000-1300-7000
Design Head (m)	1.300
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	119
Invert Level (m)	5.208
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	7.0
Flush-Flo™	0.382	7.0
Kick-Flo®	0.810	5.6
Mean Flow over Head Range	-	6.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	1.200	6.7	3.000	10.4	7.000	15.5
0.200	6.5	1.400	7.2	3.500	11.2	7.500	16.0
0.300	6.9	1.600	7.7	4.000	11.9	8.000	16.6
0.400	7.0	1.800	8.1	4.500	12.6	8.500	17.0
0.500	6.9	2.000	8.6	5.000	13.2	9.000	17.5
0.600	6.7	2.200	9.0	5.500	13.8	9.500	18.0
0.800	5.7	2.400	9.3	6.000	14.4		
1.000	6.2	2.600	9.7	6.500	15.0		

Orifice Manhole: 23, DS/PN: 4.002, Volume (m³): 1.2

Diameter (m) 0.070 Discharge Coefficient 0.600 Invert Level (m) 6.200

Hydro-Brake® Optimum Manhole: 25, DS/PN: 4.004, Volume (m³): 2.1

Unit Reference	MD-SHE-0096-4000-0900-4000
Design Head (m)	0.900
Design Flow (l/s)	4.0

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Hydro-Brake® Optimum Manhole: 25, DS/PN: 4.004, Volume (m³): 2.1

Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	96
Invert Level (m)	5.855
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	4.0
Flush-Flo™	0.266	4.0
Kick-Flo®	0.578	3.3
Mean Flow over Head Range	-	3.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.6	3.000	7.0	7.000	10.5
0.200	3.9	1.400	4.9	3.500	7.5	7.500	10.8
0.300	4.0	1.600	5.2	4.000	8.0	8.000	11.2
0.400	3.9	1.800	5.5	4.500	8.5	8.500	11.5
0.500	3.7	2.000	5.8	5.000	8.9	9.000	11.8
0.600	3.3	2.200	6.1	5.500	9.3	9.500	12.1
0.800	3.8	2.400	6.3	6.000	9.7		
1.000	4.2	2.600	6.6	6.500	10.1		

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Storage Structures for Storm

Porous Car Park Manhole: 14, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.0
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	122.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	7.000	Cap Volume Depth (m)	0.300

Cellular Storage Manhole: 15, DS/PN: 1.002

Invert Level (m)	6.750	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	100.0	0.0	0.310	0.0	0.0
0.300	100.0	0.0			

Cellular Storage Manhole: 19, DS/PN: 3.000

Invert Level (m)	5.800	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	200.0	0.0	0.610	0.0	0.0
0.600	200.0	0.0			

Cellular Storage Manhole: 19, DS/PN: 1.006

Invert Level (m)	5.800	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	300.0	0.0	0.610	0.0	0.0
0.600	300.0	0.0			

Cellular Storage Manhole: 23, DS/PN: 4.002

Invert Level (m)	6.544	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

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Cellular Storage Manhole: 23, DS/PN: 4.002

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	100.0	0.0	0.310	0.0	0.0
0.300	100.0	0.0			

Cellular Storage Manhole: 24, DS/PN: 5.000

Invert Level (m) 6.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	150.0	0.0	0.610	0.0	0.0
0.600	150.0	0.0			

Cellular Storage Manhole: 25, DS/PN: 6.000

Invert Level (m) 6.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	180.0	0.0	0.610	0.0	0.0
0.600	180.0	0.0			

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 7
Number of Online Controls 4 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	13	15 Winter	100	+45%	30/15 Summer	100/15 Summer		
1.001	14	120 Winter	100	+45%	1/15 Summer			
1.002	15	120 Winter	100	+45%	1/15 Summer			
1.003	16	360 Winter	100	+45%				
1.004	17	480 Winter	100	+45%				
2.000	20	15 Winter	100	+45%	30/15 Summer			
2.001	7	480 Winter	100	+45%	1/15 Summer			
1.005	18	480 Winter	100	+45%	1/15 Summer			
3.000	19	600 Winter	100	+45%	30/120 Winter			
3.001	20	480 Winter	100	+45%	30/15 Summer			
1.006	19	480 Winter	100	+45%	1/15 Summer			
1.007	20	480 Winter	100	+45%	1/15 Summer			
4.000	21	15 Winter	100	+45%	100/15 Summer			
4.001	22	15 Winter	100	+45%	30/15 Summer			
4.002	23	60 Winter	100	+45%	1/15 Summer			

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	13	7.450	0.600	0.269	1.41			19.5	FLOOD
1.001	14	7.196	0.544	0.000	0.91		59	12.5	FLOOD RISK
1.002	15	7.182	0.688	0.000	0.14			4.5	FLOOD RISK
1.003	16	6.313	-0.130	0.000	0.12			4.5	OK
1.004	17	6.304	0.000	0.000	0.20			7.4	OK
2.000	20	6.311	0.436	0.000	0.42			14.1	SURCHARGED
2.001	7	6.294	0.546	0.000	0.13			4.5	SURCHARGED
1.005	18	6.293	0.664	0.000	0.27			15.3	SURCHARGED
3.000	19	6.286	0.336	0.000	0.20		404	2.6	SURCHARGED
3.001	20	6.286	0.397	0.000	0.09			2.4	SURCHARGED
1.006	19	6.287	0.741	0.000	0.12		421	6.4	SURCHARGED
1.007	20	6.283	0.850	0.000	0.23			7.0	SURCHARGED
4.000	21	7.210	0.360	0.000	1.40			18.8	FLOOD RISK
4.001	22	6.995	0.345	0.000	2.87			35.4	FLOOD RISK
4.002	23	6.721	0.371	0.000	0.32		46	5.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	13	2
1.001	14	
1.002	15	
1.003	16	
1.004	17	
2.000	20	
2.001	7	
1.005	18	
3.000	19	
3.001	20	
1.006	19	
1.007	20	
4.000	21	
4.001	22	
4.002	23	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.000	24	360 Winter	100	+45%	100/30 Summer				6.560
5.001	27	240 Winter	100	+45%	1/15 Summer				6.559
6.000	25	240 Winter	100	+45%	30/60 Winter				6.568
6.001	29	240 Winter	100	+45%	1/15 Summer				6.564
4.003	24	240 Winter	100	+45%	1/15 Summer				6.560
4.004	25	240 Winter	100	+45%	1/15 Summer				6.555

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.000	24	0.210	0.000	0.14		321	1.7	SURCHARGED	
5.001	27	0.254	0.000	0.08			1.6	SURCHARGED	
6.000	25	0.218	0.000	0.15			1.8	SURCHARGED	
6.001	29	0.261	0.000	0.09			1.8	SURCHARGED	
4.003	24	0.372	0.000	0.11			4.0	SURCHARGED	
4.004	25	0.474	0.000	0.13			4.0	SURCHARGED	

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Appendix I

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	**Very low**	**0.2**	**0.2**	**0.05**
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, home zones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 1: Pollution hazard indices for different land use classifications

(land use in bold applicable for the development).

	Mitigation indices		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bio retention system (Green roof)	**0.8**	**0.8**	**0.8**
Permeable pavement	**0.7**	**0.6**	**0.7**
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	**These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.**		

Table 2: Indicative SuDS mitigation indices for discharges to surface waters

(bold text is applicable to this development).

For surface water discharge from Residential Parking Areas and Low Traffic Roads <300 traffic movements/day			
	Required mitigation indices		
Source	TSS	Metals	Hydrocarbons
Low	0.2	0.2	0.05
Type of SuDS component provided			
Permeable pavement	0.7	0.6	0.7
Total	0.7	0.6	0.7
Check	+0.5	+0.4	+0.65

Table 3: SuDS mitigation indices provided

Appendix J

1.0 INTRODUCTION

1.1 The development at Palk Road includes a number of Sustainable Drainage Systems (SuDS) as part of the surface water drainage system including permeable paving and geocellular tanks. This Technical Note sets out an outline management plan for the aforementioned SuDS components.

1.2 The proposed SuDS components in addition to addressing climate change will bring a number of benefits in terms of water quality, environmental, and social amenity.

1.3 The maintenance of all SuDS components will be in accord with the best practices and CIRIA document C753 "The SuDS Manual". Typical maintenance activities for the proposed SuDS components have been reproduced from Table 32.1 of "The SuDS Manual" in **Table 1** below. A private management company will be set up to maintain the surface water drainage network, including on-site SuDS. .

Table 1: Typical SuDS Maintenance Activities

Operation and maintenance activity	SuDS component	
	Geo-cellular Tank	Permeable paving Green roof
Regular maintenance		
Inspection	■	■
Litter and debris removal	□	■
Grass cutting		
Weed and invasive plant control		□
Shrub management		□
Shoreline vegetation		
Aquatic vegetation management		
Occasional maintenance		
Sediment management	■	■
Vegetation replacement		
Vacuum sweeping and brushing		■
Remedial maintenance		
Structure rehabilitation / repair	□	□
■ will be required □ may be required		

2.0 SuDS MANAGEMENT PLAN

2.1 This plan is intended to cover all on-site drainage structures. The Site Management Team should oversee and implement the SuDS Management Plan and designate a qualified person who will be responsible for the proper operation and maintenance of the surface water drainage structures.

Water Quality Management

2.2 In line with Tables 26.2 and 26.3 of the CIRIA C753 The SuDS Manual, it can be seen that the proposed permeable paving would provide sufficient treatment for the surface water runoff from the Site.

2.3 The surface drainage network would also be designed to protect and enhance the quality of surface water runoff through the removal of sediment and pollutants. Catchpit manholes and silt trapped gullies will reduce the amount of pollutants entering the system. Preventive maintenance of the system will include a comprehensive source reduction program of regular sweeping and litter removal, prohibitions on the use of pesticides, and maintenance of bin areas.

Maintenance Program

2.4 The Site Management Team will conduct the SuDS Management Plan set forth in this document. The Site Management will ensure that inspections and record keeping are timely and accurate. Inspection & Maintenance Log Forms should include the date and physical conditions of the structures, depth of sediment in structures, evidence of overtopping or debris blockage and maintenance required of each structure. Records of maintenance will be kept on file on-site and copies of Inspection & Maintenance Log sheets indicating all work and inspections will be available to the Council upon request. A model Maintenance log in appended for reference.

2.5 Regular maintenance should include:

- Inspect channel and gully inlet grates and remove any debris every 6 months or as determined to be reasonable based on experience with the installed

systems to ensure that the gullies are working in their intended fashion and that they are free of debris;

- Inspect gully sumps and bottom of drain manholes quarterly; if depth of sediment in sumps exceeds 50% capacity, sediment must be removed. Excessive sediment shall be removed and properly disposed by a licensed drainage cleaning company.
- All litter shall be picked up and removed from the parking areas, external bin stores and soft landscaping.
- Inspect external bin stores for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the surface water drainage network.
- The inlets, outlet and vents and overflows of SuDS components should be checked annually and after large storms to ensure that they are in good condition and operating as designed. Regular maintenance includes inspection and identification of any areas that are not operating correctly monthly for the first 3 months and then every 6 months after.

Winter Maintenance Program

2.6 Ensure that drainage structures are not blocked by ice, snow, debris or rubbish during winter months.

Operation and Maintenance requirements

2.7 Recommendations for the operation and maintenance including typical frequencies are included in **Tables 2** and **3**below.

Table 22: SuDS Operation and Maintenance Requirements- Permeable paving

SUDS Element	**Permeable Paving**	
Maintenance Period	**Maintenance Task**	**Frequency**
Regular Maintenance	Brushing and vacuuming	Once a year or as required
Occasional Maintenance	Stabilise and mow contributing adjacent area	As required
	Removal of weed or management using glyphospate applied directly	As required

	into weeds by an applicator rather than spraying	
Remedial Work	Remediate any landscaping which has been raised to within 50mm of the level of the paving	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to structural performance or a hazard to users.	As required.
Monitoring	Rehabilitation of surface or upper structure by remedial sweeping	Every 10 to 15 years, or as required
	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48hrs after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 3: SuDS Operation and Maintenance Requirements- Attenuation tank

SUDS Element	**Attenuation Tank**	
Maintenance Period	**Maintenance Task**	**Frequency**
Maintenance Work	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risk to performance)	Monthly

	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial Work	Repair/rehabilitate inlets, outlets, overflows and vents	As required.
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually.
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required.

Suds Management Plan- Appendix A

Drainage Operation and Maintenance Log

Site Maintenance Supervisor:_____ Date:_____

☐ Routine ☐ Response to rainfall event _ in ☐ Other:_____

BMP	Frequency	Date Performed	Comments
Gullies and Manholes	Monthly Inspections		
	Maintenance Quarterly and as necessary		
Pavement Areas (parking, driveways, service areas)	Quarterly Sweeping		
	Rubbish & Litter Removal as Necessary		
Geocellular attenuation (permavoid)	Bi-annual maintenance as necessary		
	Inspect and identify areas not operating property every 3 months (for the first 3 months) and every 6 months after		
Geocellular attenuation (permavoid)	Full bi-annual inspection		

Appendix K

PRELIMINARY DRAINAGE CALCULATIONS

24/10/2022

PROPOSED FOUL WATER

ARDENT
CONSULTING ENGINEERS

Unit Type	Proposed Area/Units		Hours (hrs)	Foul Water Flow Rate l/day			Peak Factor	Peaked Loading l/s			Loading (l/s)
General Housing p	90	units	24	150	per	person	6.6	0.0114583	per	person	1.031

TOTAL PROPOSED FOUL LOADING = **1.031**