

Our reference: 20200-CUR-XX-EX-RP-G-0001-P02

6th May 2021

Jon Gaskell
Morgan Sindall Construction & Infrastructure Ltd
6th Floor, Anchorage 2
Manchester
M50 3YW

Dear Jon,

**Re: Phase 2 Ground Investigation Environmental Letter Report
Temporary Car Parks at North Manchester General Hospital**

A - Introduction

Curtins were instructed by Hive Project Ltd & Morgan Sindall for and on behalf of Manchester University NHS Foundation Trust, to undertake a ground investigation within the proposed Temporary Car Parks (TCP01 & TCP05) located in the grounds of the North Manchester General Hospital (NMGH). TCP01 is located north of Ellis Drive, M8 5EP and is currently occupied by a former allotment space which is currently fenced and inaccessible to the public. TCP05 is currently occupied by the infectious diseases building and adjacent car park.

This letter has been written to support discharge of planning condition 14, section a) and b) for the temporary car parks, as detailed in Manchester City Council Planning Permission application number 128905/FO/2020.

B - Previous Report and Summary

Curtins previously undertook the following report which covers the area of TCP01 and TCP05;

- 1) December 2020 – Phase 1 Preliminary Risk Assessment for North Manchester General Hospital – Enabling Works and Temporary Car Parks**, ref. 075805.003-CUR-00-GE-XX-RP-001-V03.

It is assumed that the above report has been made available for review and therefore is not included herein.

Phase 1 Preliminary Risk Assessment Summary (December 2021)

TCP01

The report indicated that the site was historically occupied by fields; and by 1894 mapping was shown to be a part of the wider Manchester Workhouse. The site remained unchanged until 1986 when the historical buildings were demolished and replaced by areas of landscaping and hardstanding, understood to be an area of allotments associated with the hospital.

Superficial deposits are underlain by the Chester Formation (sandstone). The superficial are recorded as Secondary A Aquifers corresponding to the Glaciofluvial Sheet Deposits. The Chester Formation is designated as a Principal Aquifer. There are no groundwater abstraction points within 500m and the site is not located within a Source Protection Zone (SPZ).



The nearest surface water feature is the River Irk 449m east of the site flowing southwards.

A Preliminary Conceptual Site Model considered that the site presents a **Moderate/Low** risk to site end users from potentially contaminated shallow soils. The risk to groundwater and surface water receptors was considered to be **Low** and **Very Low** respectively due to the geology on site and distance to the nearest water feature.

Due to the site's proposed end use as a surface car park, with no structures or buildings proposed, the risk to site end users from ground gases was considered to be **Low**.

TCP05

The report indicated that the site was historically occupied by fields; and by 1894 mapping was shown to be a part of the wider Prestwich Union House site now the infectious disease building and is occupied in the south by tennis courts in 1954 which are replaced with the current car park by 2000.

Considering the tennis courts constructed on site by 1954 and replaced by a car park in 2000, Made Ground is anticipated across the site. BGS data indicates Glaciofluvial Sheet Deposits (sands and gravels) across the site.

Superficial deposits are underlain by the Chester Formation (sandstone). The superficial deposits are recorded as Secondary Undifferentiated Aquifer corresponding to the Glacial Till deposit. The Chester Formation is designated as a Principal Aquifer. There are no groundwater abstraction points within 500m and the site is not located within a Source Protection Zone (SPZ).

The nearest surface water feature is the River Irk 189m east of the site flowing southwards.

A Preliminary Conceptual Site Model considered that the site presents a **Moderate/Low** risk to site end users from potentially contaminated shallow soils. The risk to groundwater and surface water receptors was considered to be **Moderate/Low** and **Very Low** respectively.

Due to the site's proposed end use as a surface car park, with no structures or buildings proposed, the risk to site end users from ground gases was considered to be **Low**.

C – Intrusive Investigation (March 2021)

Introduction

This investigation was to assess the ground conditions and to aid contamination assessment in the area of the proposed Temporary Car Parks, to be used during the wider redevelopment of NMGH in the coming years.

At the time of the investigation, the area of the proposed TCP01 is fenced and inaccessible to the public; occupied by overgrown raised beds and trees along the boundaries; green houses and sheds to the east and paved hard standing access routes through the site. Two gateways access the site from Ellis Drive to the south. Street lighting is in the centre of the site.

TCP05 is currently occupied by the infectious diseases building and adjacent car park.



Scope of Works

The intrusive works comprised the advancement of;

TCP01

3no Window Sample boreholes (WS501 to WS503) to a maximum 5.45m bgl and 3no California Bearing Ratio (CBR) Tests (CBR501 to CBR503) at 0.25m and 0.40m bgl.

TCP05 & Service Diversion

5no Window Sample boreholes (WS101 to WS102 and WS401 to WS403) to a maximum 5.45m bgl and 3no California Bearing Ratio (CBR) Tests (CBR401 to CBR403) at 0.40m and 0.75m bgl.

The exploratory hole logs and an exploratory hole plans, (ref. 20200-CUR-XX-EX-DR-G-0001 to 0003) which are included at the end of this report for reference.

Three Made Ground soil samples were obtained from the window sample boreholes to allow for chemical and testing to be undertaken, with the testing suite detailed in *Table 1.0*:

Table 1.0 – Environmental testing suite (Soils)

Suite Ref.	Analyte	LOD
Soils Suite A	Asbestos Screen, pH and Soil Organic Matter (SOM)	-
	Arsenic, Chromium, Chromium VI, Copper, Lead, Selenium, Zinc, Nickel	1 - 5 mg/kg
	Boron (water soluble)	1 mg/kg
	Cadmium	0.5 mg/kg
	Mercury	0.1 mg/kg
	Cyanide (total)	1 mg/kg
	Sulphate (water sol 2:1)	0.01 mg/kg
	Phenols (screen)	0.2 mg/kg
	PAHs (USEPA 16)	0.01 – 0.08 mg/kg
	TPH (Aro/Alk Split)	0.01 to 0.1 mg/kg

At the request of Morgan Sindall selected soils samples were also subjected to a full solid and leachate Waste Acceptance Criteria analysis.

Summary of Ground Conditions

A summary of the ground conditions encountered during the site investigation works is presented in *Table 2.0a* and *Table 2.0b*, below, with detailed information presented in the exploratory hole logs included at the end of this report. A summary of each strata is included in the below tables.

Table 2.0a – Summary of encountered ground conditions TCP01:

Stratum	Depth to Top of Strata (m bgl)	Thickness (m)		Description
		Min	Max	
TOPSOIL WS503, CBR502 and CBR503	0.00	0.05	0.40	Grass over brown silty clay topsoil with frequent rootlets. Rare angular to subangular fine to coarse gravel including brick and coal.



Stratum	Depth to Top of Strata (m bgl)	Thickness (m)		Description
		Min	Max	
BLOCK PAVING WS501, WS502 and CBR501	0.00	0.15	0.20	Block paving 0.10m thick underlain by reddish brown medium to coarse sand.
MADE GROUND ¹	0.20 – 0.40	0.15	0.85	WS501 – Grey sandy angular to subrounded fine to medium gravel of mixed lithologies including limestone. Sand is medium to coarse. WS502, WS503 and CBR502 – Grey/brown angular to subrounded medium to coarse gravel of limestone with moderate cobble content. Cobbles are angular of limestone. WS502 – Dark grey slightly gravelly clay. Gravel is angular to subrounded fine to coarse of mixed lithologies including ash, coal and brick. CBR503 – Dark brown slightly clayey gravelly medium to coarse SAND with high intact brick content. Gravel is angular to subrounded fine to coarse include brick and coal. CBR501 – Dark grey slightly gravelly clay. Gravel is angular to subrounded fine to coarse of mixed lithologies including ash, coal and brick.
GLACIAL TILL (clay) WS501 – WS503 and CBR501	0.35 – 1.00	>0.05 ²	1.50	WS502 only - Very soft light brown slightly sandy CLAY with rare gravel. Sand is fine to medium. Gravel is angular to subrounded fine to coarse of mixed lithologies WS501 only - Very soft brown/grey laminated CLAY Underlain by Firm light brown/grey slightly gravelly slightly to very sandy CLAY. Sand is fine to medium. Gravel is angular to subrounded fine to coarse gravel including coal.
GLACIOFLUVIAL SHEET DEPOSITS (sands and gravels) WS501 – WS503³	1.50 – 2.10	0.20	1.95	WS502 only - Loose light brown clayey fine to medium SAND. Medium dense grey/brown fine to medium clayey SAND, or medium to coarse with rare bands of fine gravel of coal
GLACIAL TILL (clay) WS501	2.30	0.50		Firm grey/brown very sandy CLAY. Sand is fine to medium.
GLACIOFLUVIAL SHEET DEPOSITS (sands and gravels) WS501	2.80	>2.65 ⁴		Dense light brown clayey fine to medium SAND. Underlain by Very dense light brown fine SAND with 1mm bands of fine coal gravel

1 – Base of strata not encountered in CBR502 and CBR503

2 – Base of strata not encountered in CBR501

3 – Base of strata not encountered in WS502 and WS503

4 – Base of strata not encountered

In line with the anticipated superficial deposits, it is considered that the Glacial Till (clay) and Glaciofluvial Sheet Deposits (sand and gravel) are interbedded across the site. Thicker granular deposits were encountered in WS502 and WS503, with the exploratory holes terminated at 3.45m in these deposits. WS501 in the north extended to 5.45m bgl.

A groundwater seepage was encountered at 0.60m bgl in WS501. Wet sand deposits were encountered at 2.10m and 3.00m bgl in WS501, while damp sand deposits were encountered in WS503 at 2.00m bgl.

Table 2.0B – Summary of encountered ground conditions TCP05 & Service Diversion:



Stratum	Depth to Top of Strata (m bgl)	Thickness (m)		Description
		Min	Max	
TOPSOIL WS403 A-D, CBR402 and CBR 403	0.00	0.07	0.10	Grass over brown silty clay topsoil with frequent rootlets. Rare angular to subangular fine to coarse gravel including brick and coal.
ASPHALT WS101, WS102, WS401, WS402 and CBR401	0.00	0.07	0.12	Asphalt underlain by sub base comprising light brown sandy angular to subrounded fine to medium gravel of limestone and brick.
MADE GROUND ¹ All locations except CBR402 & CBR403	0.20 – 0.40	0.15	>2.00	Light brown to dark brown sandy angular to subrounded fine to coarse gravel including brick concrete and metal with various ash and cobble content.
GLACIOFLUVIAL SHEET DEPOSITS (sands and gravels) WS401 – WS403 and WS101	0.48 – 0.80	0.20	0.40	Medium dense light brown to dark brown fine to coarse SAND.
GLACIAL TILL ² (clay) WS501 – WS503 and CBR501	0.08 – 1.70	1.1	>3.8	Firm to Stiff light brown, orange brown sandy slightly gravelly CLAY.
GLACIOFLUVIAL SHEET DEPOSITS ³ (sands and gravels) WS401 – WS403, WS101 and CBR401-403	2.8 – 3	0.20	>1.22	WS502 only - Loose light brown clayey fine to medium SAND. Medium dense grey/brown fine to medium clayey SAND, or medium to coarse with rare bands of fine gravel of coal

1 - Base of strata not encountered in WS102.

2 - Base of strata not encountered in CBR401-403.

3 - Base of strata not encountered in WS101 & WS402.

Contamination Assessment

Eight Made Ground and one natural Sand samples were obtained in total from the window sample boreholes. The samples were environmentally chemically analysed according to the testing suite outlined in *Table 1.0*. Considering the sites proposed end-use as a Temporary Car Park, results were compared against adopted 'Commercial' Generic Assessment Criteria (GACs) as a conservative assessment.

Soil organic matter (SOM) content has an influence on the volatilisation of organic contaminants (i.e. the higher the SOM, the lower the volatilisation rate and therefore inhalation exposure risk). Soil organic matter (SOM) values for the Made Ground soils ranged from 0.01% to 9.7% by weight. The high organic content encountered is representative of the high ash content recorded within a number of the exploratory holes. With consideration for a calculated geometric average, Made Ground features determine an SOM of 3.29%. As such, a comparison against Tier 1 thresholds for SOM of 2.5% for 'Commercial' end use has been adopted for Made Ground soil features.

The full chemical testing results and adopted GAC's are listed in at the end of this report.

With the exception of asbestos identification, no exceedances have been recorded above the 'Commercial' GACs. Asbestos fibres were positively identified during laboratory testing within WS402 & WS403, both at a concentration of 0.003%. Delineation boreholes WS402A-D and WS403A-D were completed to ascertain if this was part of a wider impacted area. Boreholes were positioned approximately 2-3m north south east and west



of the original positions with made ground samples obtained from the same strata or depth as the original positive identification. None of the additional delineation boreholes encountered positive asbestos identifications and as such it is deemed that these are isolated instances. Given that the end use is a surfaced car park the risk to end users is **Low** and construction works is **Low** where suitable PPE is utilised for groundworkers.

Conclusions

The ground investigation has encountered surface coverings of grass over topsoil, asphalt or block paving underlain by Made Ground to depths of 0.35-1.00m bgl. Superficial deposits encountered during the investigation have been in line with BGS data, with cohesive Glacial Till interbedded with granular Glaciofluvial Sheet Deposits. The investigation was terminated at maximum depth of 5.45m in WS501. WS502 and WS503 were terminated at 3.45m bgl in medium dense sand.

Environmental analysis for a broad range of contaminants has been undertaken on three Made Ground soil samples. As a conservative assessment, the results of the testing have been compared against 'Commercial' GACs at 2.5% SOM. With the exception of asbestos identification, no exceedances have been recorded above the 'Commercial' GACs. Asbestos fibres were positively identified during laboratory testing within WS402 & WS403, both at a concentration of 0.003%. Delineation boreholes WS402A-D and WS403A-D were completed to ascertain if this was part of a wider impacted area. Boreholes were positioned approximately 2-3m north south east and west of the original positions with made ground samples obtained from the same strata or depth as the original positive identification. None of the additional delineation boreholes encountered positive asbestos identifications and as such it is deemed that these are isolated instances.

Consequently, the risk to site end users and construction workers from shallow site soils is therefore considered to be **Low**. Construction workers are to be provided with appropriate PPE and sanitary facilities with reference to the enclosed environmental testing results.

Due to the site's proposed end use as a surface car park, with no structures or buildings proposed, the risk to site end users from ground gases was considered to be **Low**. If the proposed development were to change and include buildings, a detailed ground gas risk assessment would be required.

It is considered that a Remediation Statement will not be required for this site.

Yours sincerely,

S Hyde
Senior Geo-Environmental Engineer

For and on behalf of
Curtins Consulting Ltd

Appendices

Development Plans

- Curtins drawing ref. 20200-CUR-MSCP-EXDR-D-9511 P01
- Curtins drawing ref. 20200-CUR-MSCP-EX-DR-D-9521 P02

Exploratory Borehole Plans

- Curtins drawing ref. 20200-CUR-XX-EX-DR-G-0001 to 0003

Exploratory Hole Logs



- WS101 & WS102
- WS401 – WS403
- WS402A-D & WS403A-D
- CBR401-403
- WS501 – WS503
- CBR501 – CBR503

Contamination Test Results

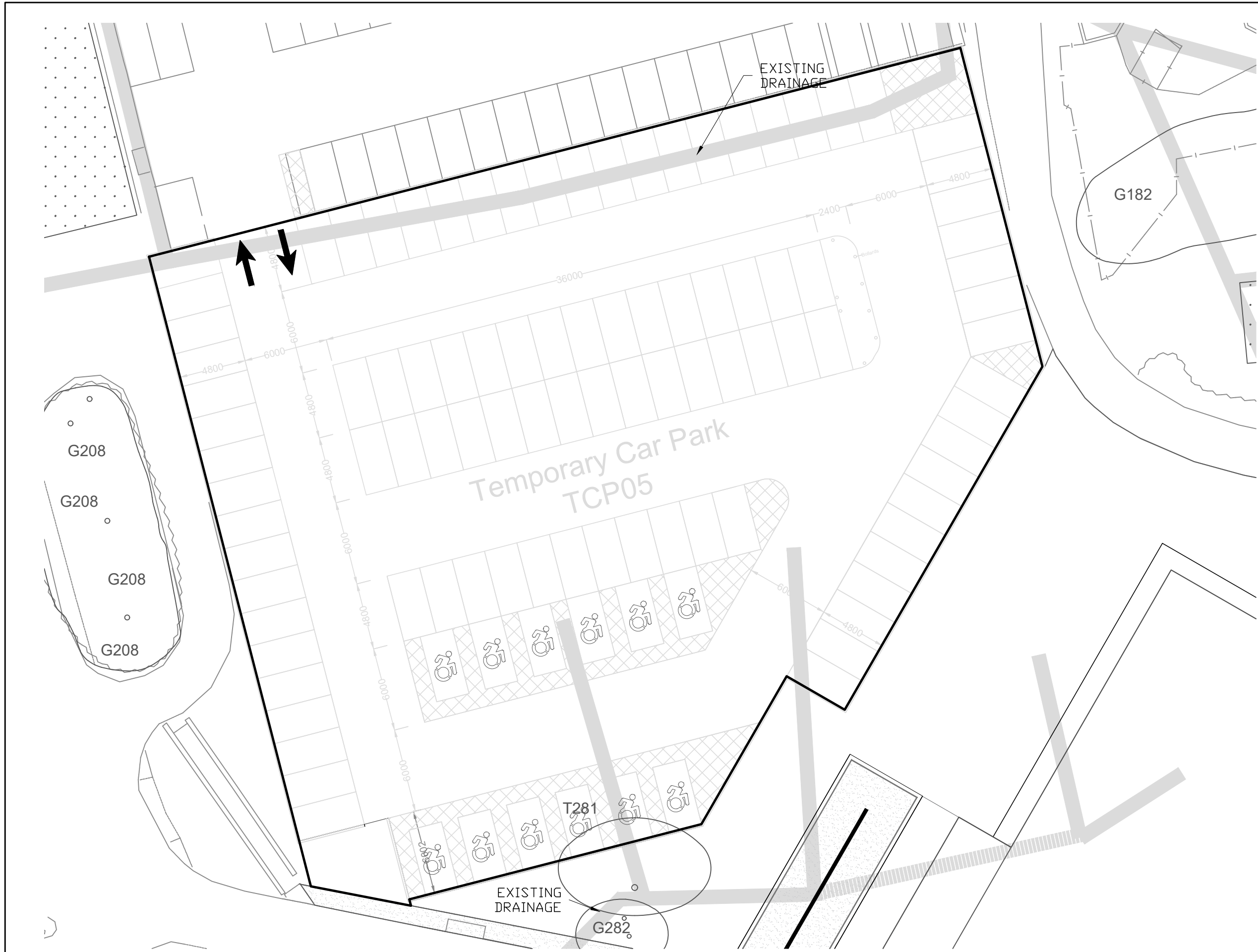
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- Envirolab, Certificate ref. 21/0215/1
- Envirolab, Certificate ref. 21/0216/2
- Envirolab, Certificate ref. 21/03612/1

Curtins Generia Assessment Criteria

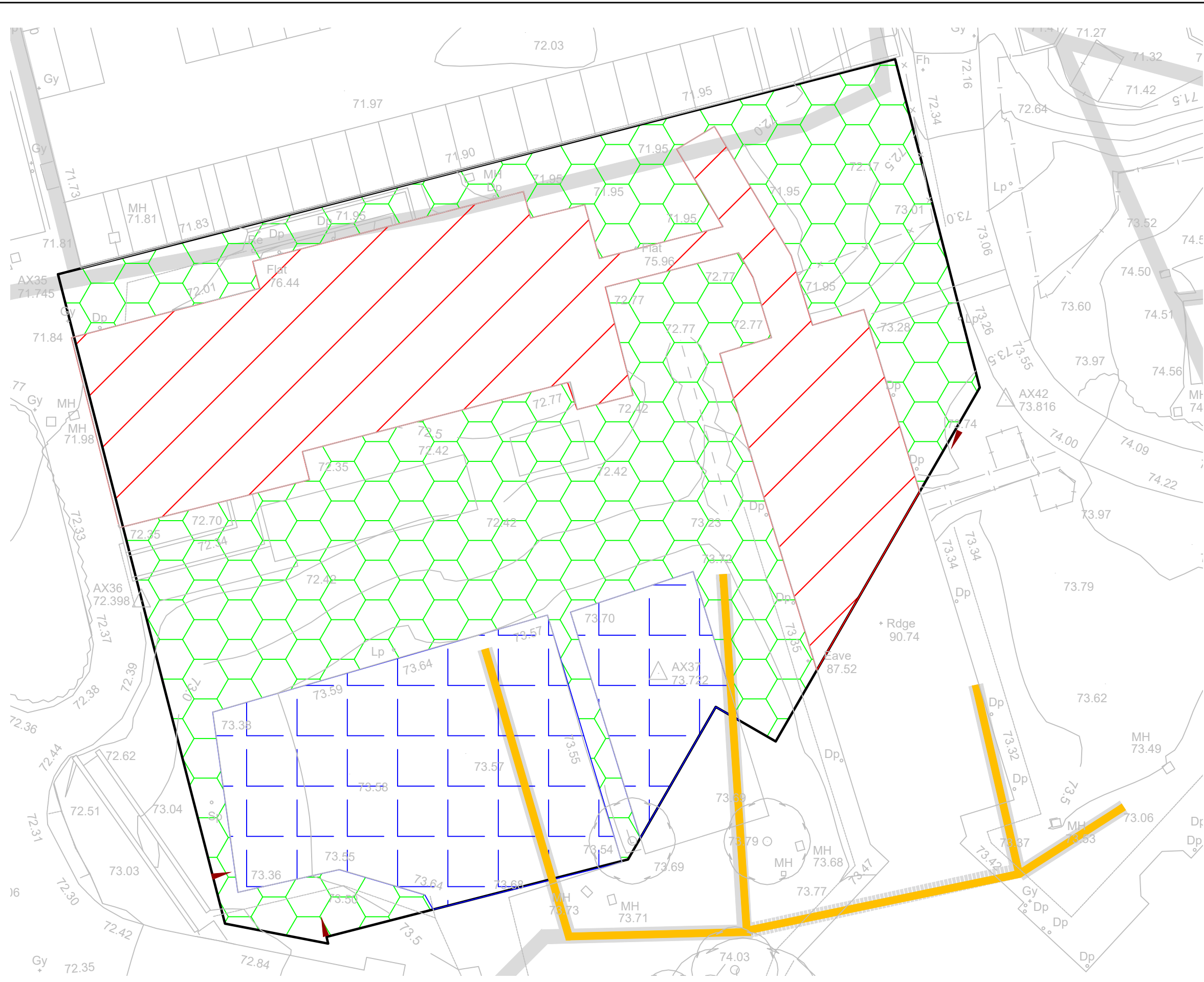
- Curtins, '*Commercial*' GAC 2.5%.



Development Plans



GENERAL ARRANGEMENT



SITE CLEARANCE

SITE CLEARANCE KEY

- REMOVE LANDSCAPING
- EXISTING DEMOLISHED BUILDINGS
- REMOVE HARDSTANDING
- EXISTING DRAINAGE RUNS CONNECTIVITY TO BE PROVEN PRIOR TO DECOMMISSIONING

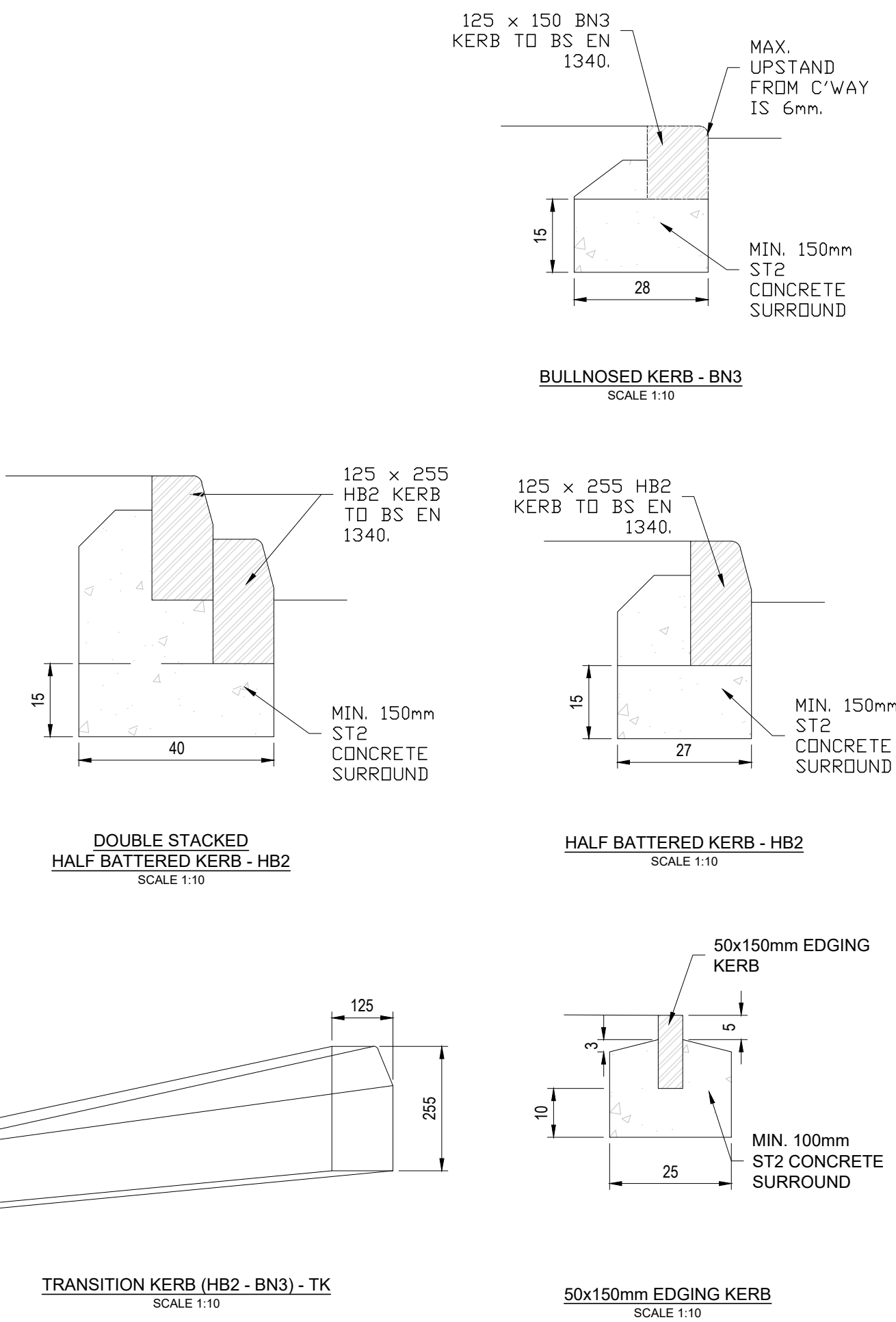
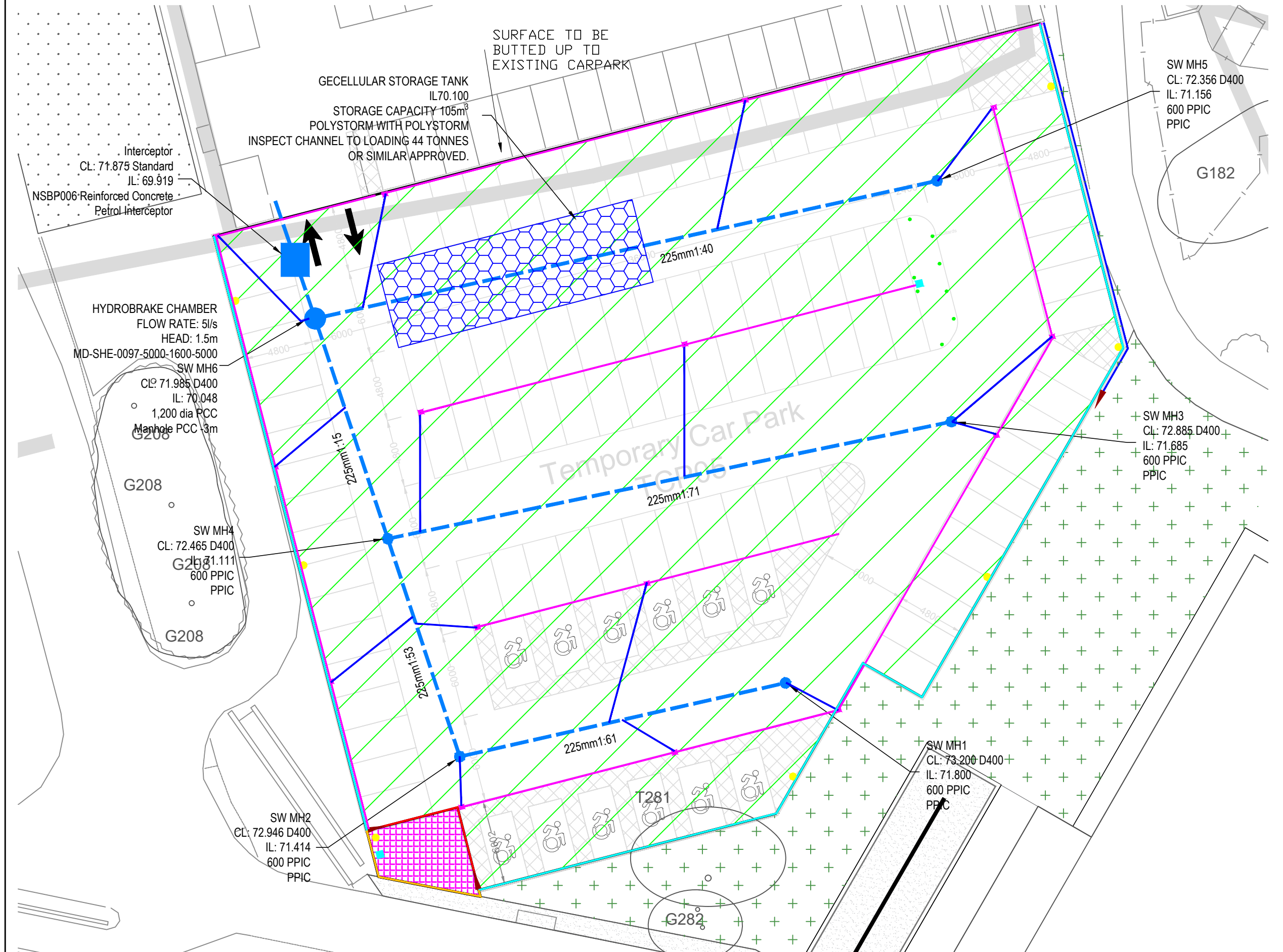
EXTERNAL WORKS KEY

- LANDSCAPING
100MM TOPSOIL AND SEED
- FULL FOOTWAY CONSTRUCTION
20MM SURFACE COURSE - AC10 DENSE SURF 100/150 TO BS EN 13108-1.
40MM BINDER COURSE - AC20 DENSE BIN 100/150 TO BS EN 13108-1.
210MM TYPE 1 GRANULAR SUB-BASE MATERIAL TO CLAUSE 803.
- FULL CARRIAGEWAY CONSTRUCTION:
40MM HRA 30/14F SURFACE COURSE 40/60 TO BS EN 13108-1.
80MM AC20 HDM BINDER COURSE 40/60 TO BS EN 13108-1.
150MM AC32 HDM BASE COURSE 40/60 TO BS EN 13108-1.
200MM TYPE 1 GRANULAR SUB-BASE TO CLAUSE 803
- EDGING KERB EK
50 X 150 mm EDGING KERB TO BACK OF FOOTWAY
- 125MM HALF BATTERED KERB HB2
PROPOSED PCC HALF BATTERED KERB WITH 125MM UPSTAND
- TRANSITION KERB (HB2 -> GROUND)
- DOUBLE 125MM HALF BATTERED KERB HB2
PROPOSED PCC HALF BATTERED KERB WITH 125MM UPSTAND
- DROPPED BULLNOSED KERB BN
PROPOSED PCC BULLNOSED KERB WITH 6MM (PEDESTRIAN) UPSTAND
- BOLLARDS
MARSHALLS ESSENTIAL MITRE TOP BOLLARD,
STAINLESS STEEL GRADE 304
- LAMP POST
TO BE DESIGNED BY OTHERS
- PARKING METERS
TO BE DESIGNED BY OTHERS
- SURFACE WATER NETWORK
- SLOT DRAIN
150MM GATIC CAST/LOT OR SIMILAR APPROVED TO D400 LOAD CLASS
- 150MM LATERAL PIPE

Notes:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- FOR GENERAL NOTES REFER TO DRAWING.
- INFILTRATION ASSUMED POSSIBLE IN THIS SCENARIO. TO BE CONFIRMED BY BRE 365 INFILTRATION TESTING.
- WALLINGFORD STORAGE ESTIMATION USED TO ANALYZE THE RUNOFF AND STORAGE
- A TOTAL OF 462.5M3 OF STORAGE AVAILABLE IN SUBBASE USING MINIMUM DEPTH OF 185mm
- PERMEABLE SURFACE AND BUILD UP DESIGNED TO PROVIDE TREATMENT PRIOR TO INFILTRATION.
- FORMATION DEPTH TO BE NO GREATER THAN 1m BELOW GL SO SHALLOW INFILTRATION CAN BE UTILIZED.
- AN EA PERMIT MAY BE REQUIRED FOR DISCHARGE TO GROUND WATER.
- DRAINAGE MUST ONLY BE DECOMMISSIONED ONCE A FULL CONNECTIVITY SURVEY HAS BEEN CARRIED OUT AND ALL CONNECTIONS ARE CONFIRMED TO BE REDUNDANT.

REV.	DATE	AMENDMENT	DRW.	CHK.
P01	31/03/21	Initial issue	DE	HS



CLIENT

NHS
Manchester University
NHS Foundation Trust

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PROJECT
North Manchester General Hospital

SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
1	2021	DE	HS	HS

TCP05 Northern Temporary Carpark
Option 2 - Standard Paving

Status

STATUS	PURPOSE FOR ISSUE	SR NO.
S3	FOR REVIEW/COMMENT	95

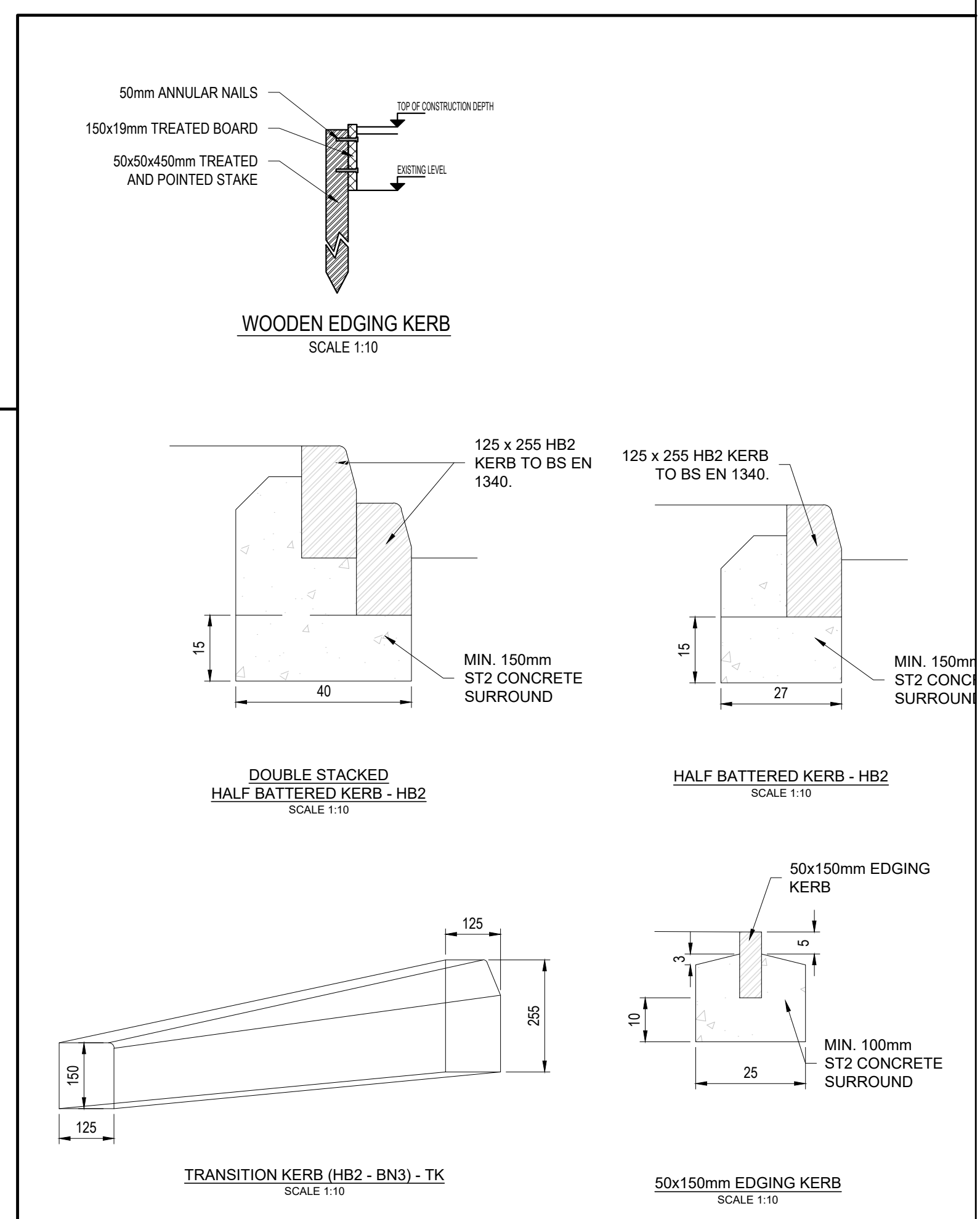
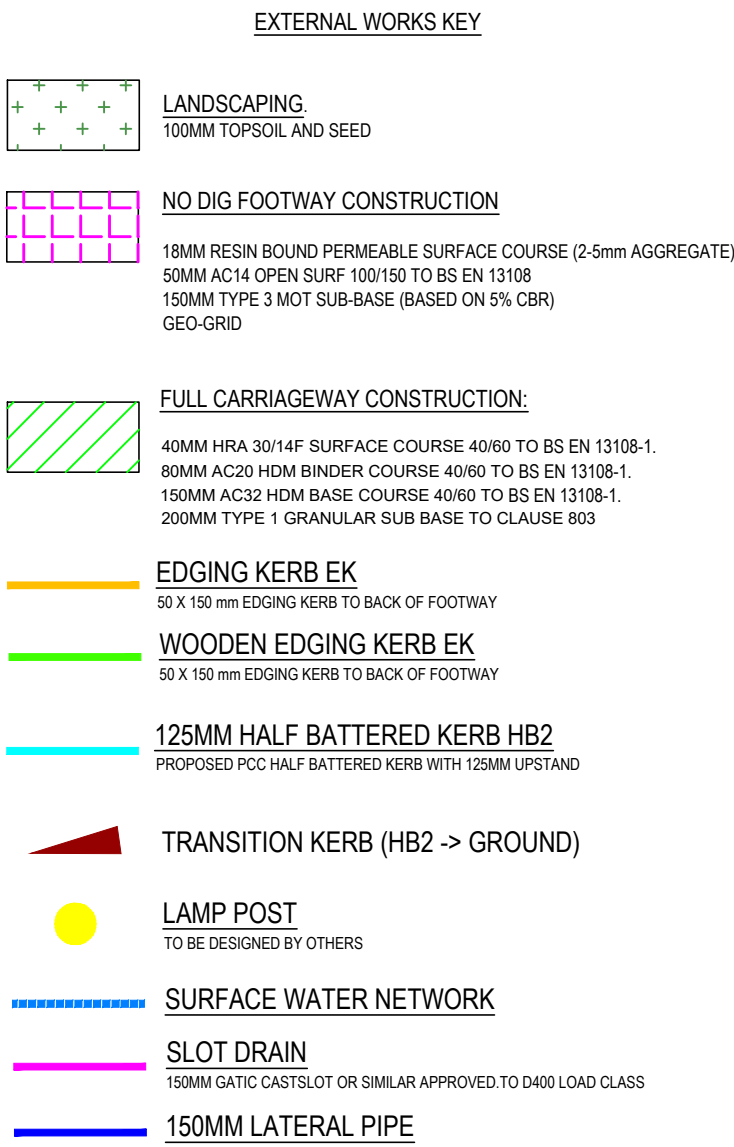
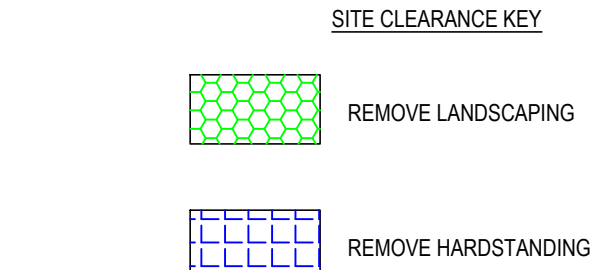
DRAWING NO.	REV.
20200-CUR-MSCP-EX-DR-D-9511	P01



GENERAL ARRANGEMENT



SITE CLEARANCE



- Notes:
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 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
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 - INFILTRATION ASSUMED POSSIBLE IN THIS SCENARIO. TO BE CONFIRMED BY BRE 365 INFILTRATION TESTING.
 - WALLINGFORD STORAGE ESTIMATION USED TO ANALYZE THE RUNOFF AND STORAGE
 - DRAINAGE MUST ONLY BE DECOMMISSIONED ONCE A FULL CONNECTIVITY SURVEY HAS BEEN CARRIED OUT AND ALL CONNECTIONS ARE CONFIRMED TO BE REDUNDANT.
 - FOR LOCATIONS AND SPECIFICATION OF STREET FURNITURE INCLUDING BOLLARDS, BARRIERS AND PAY AND DISPLAY MACHINES REFER TO SHEPPARD ROBSON DRAWINGS.

REV.	DATE	AMENDMENT	DRW.	CHK.
P01	01/04/21	FIRST ISSUE	DE	HS
P02	16/04/21	CONSTRUCTION UPDATED	DE	HS

CLIENT

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Birmingham - Bristol - Cambridge - Cardiff - Dundee - Dublin - Edinburgh - Glasgow - Harlow - Leeds - Liverpool - London - Manchester - Nottingham

PROJECT
MSCP ENABLING WORKS

SCALE@A1	DATE	ORIGINATOR	CHECKED	AUTHORISED
N/A	01/04/21	DE	HS	HS

TCP01 SOUTHERN TEMPORARY CARPARK OPTION 2 - STANDARD PAVING

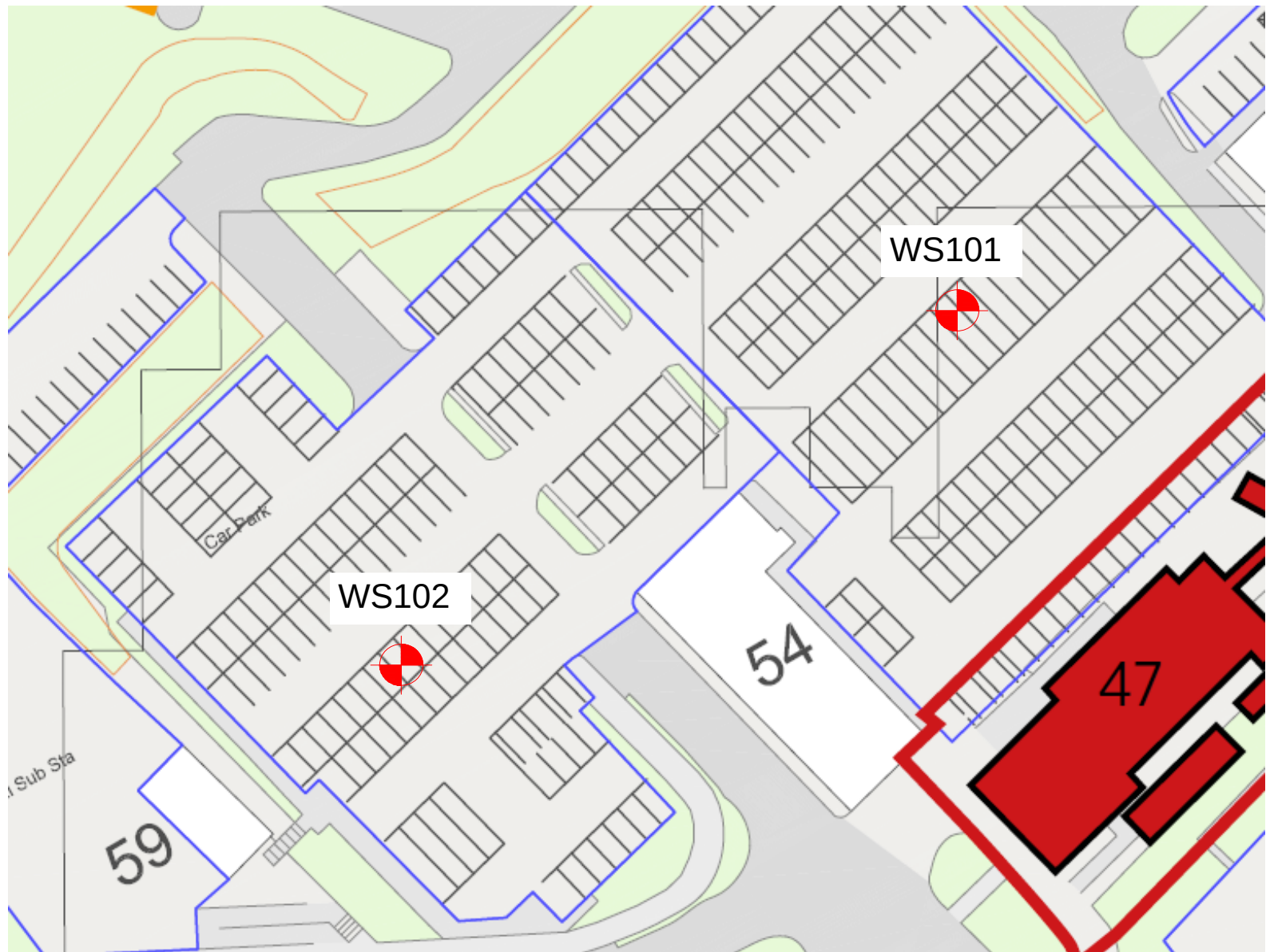
Status

STATUS	PURPOSE FOR ISSUE	SR NO.
S3	FOR REVIEW/COMMENT	95

DRAWING NO.	REV.
20200-CUR-MSCP-EX-DR-D-9521	P02



Exploratory Borehole Plans



WINDOW SAMPLE BOREHOLE LOCATION UP
TO 5M

Rev:	Description:	Date:	By:	Chkd:
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Status:

INFORMATION

Project:

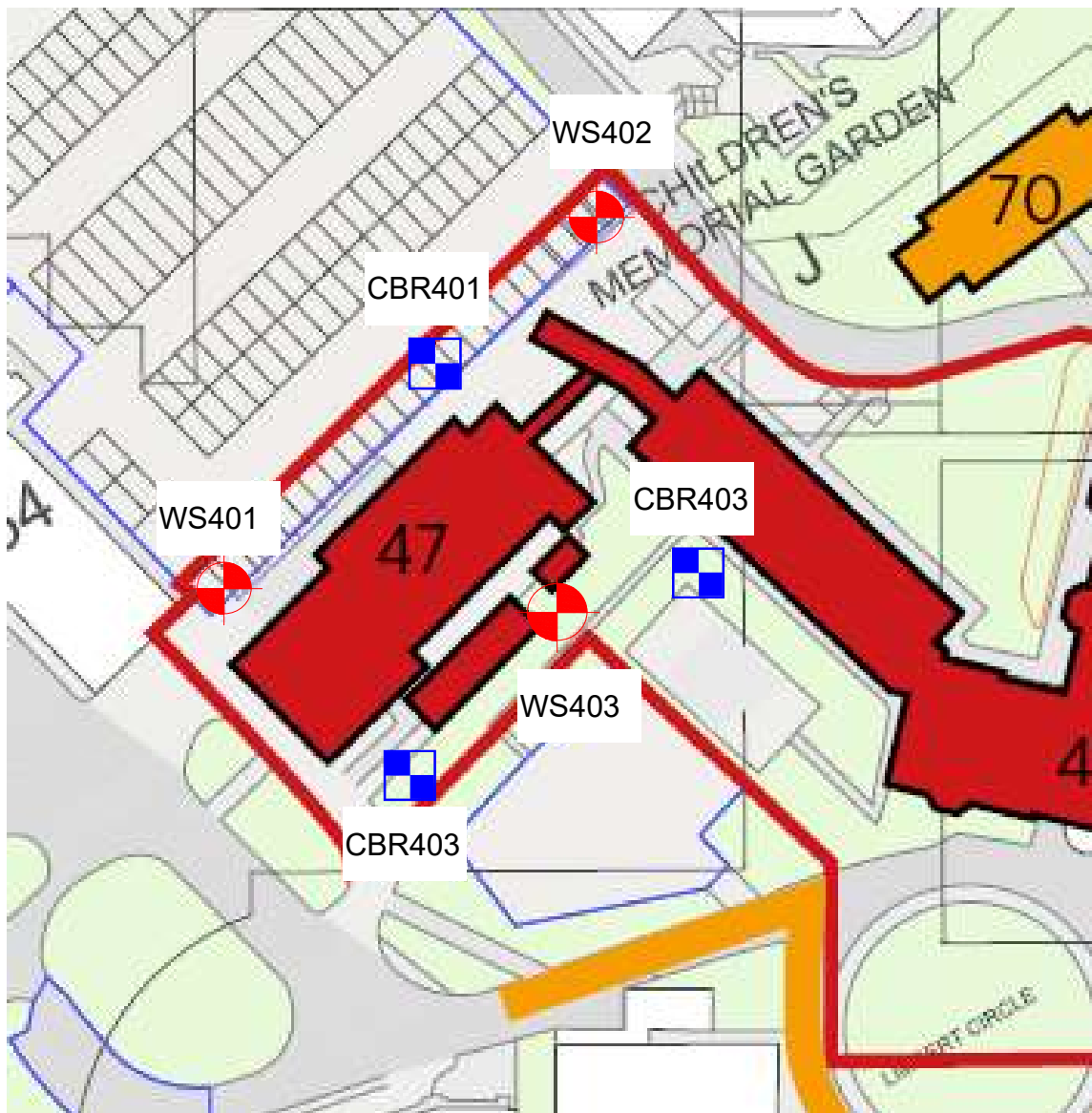
NORTH MANCHESTER GENERAL HOSPITAL

Drg Title:

**SERVICE DIVERSION EXPLORATORY HOLE
LOCATION PLAN**

Scale: NTS	Size: A3	First Issue: 30/04/2021	Drawn: RT	Checked: PN
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Drg No: 20200-CUR-XX-EX-DR-G-0001	Rev:
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WINDOW SAMPLE BOREHOLE LOCATION UP TO 5M



CBR TEST

Rev:	Description:	Date:	By:	Chkd:
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Status:

INFORMATION

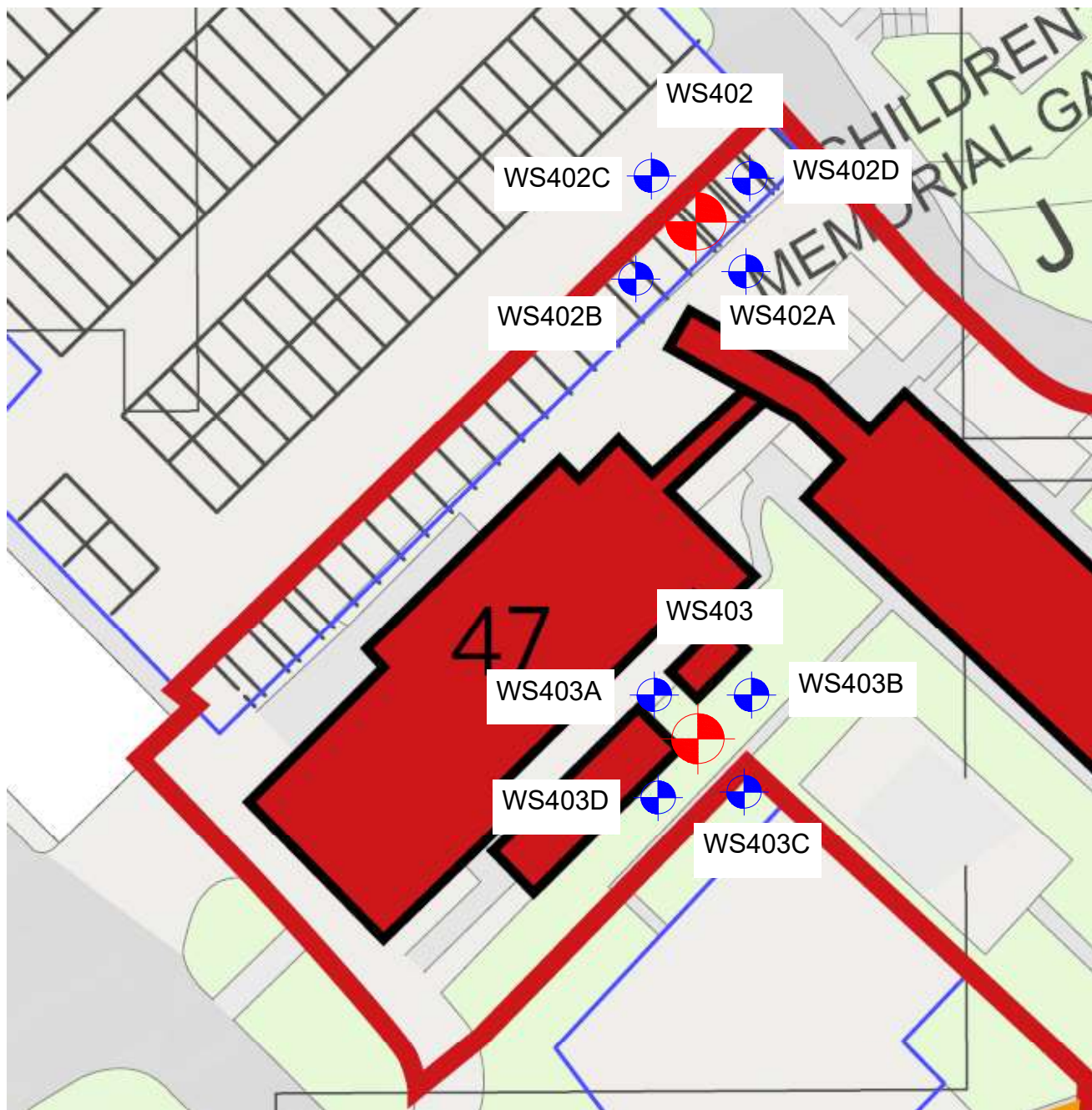
Project:

NORTH MANCHESTER GENERAL HOSPITAL

EXPLORATORY HOLE LOCATION PLAN TCP05

Scale:	Size:	First Issue:	Drawn:	Checked:
NTS	A3	30/04/2021	PN	RA

Drg No:	Rev:
20200-CUR-XX-EX-DR-G-0001	



-  WINDOW SAMPLE BOREHOLE LOCATION UP TO 5M
-  DELINEATION LOCATION

Rev:	Description:	Date:	By:	Chkd:
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Status:

INFORMATION

Project:

NORTH MANCHESTER GENERAL HOSPITAL

Drg Title:

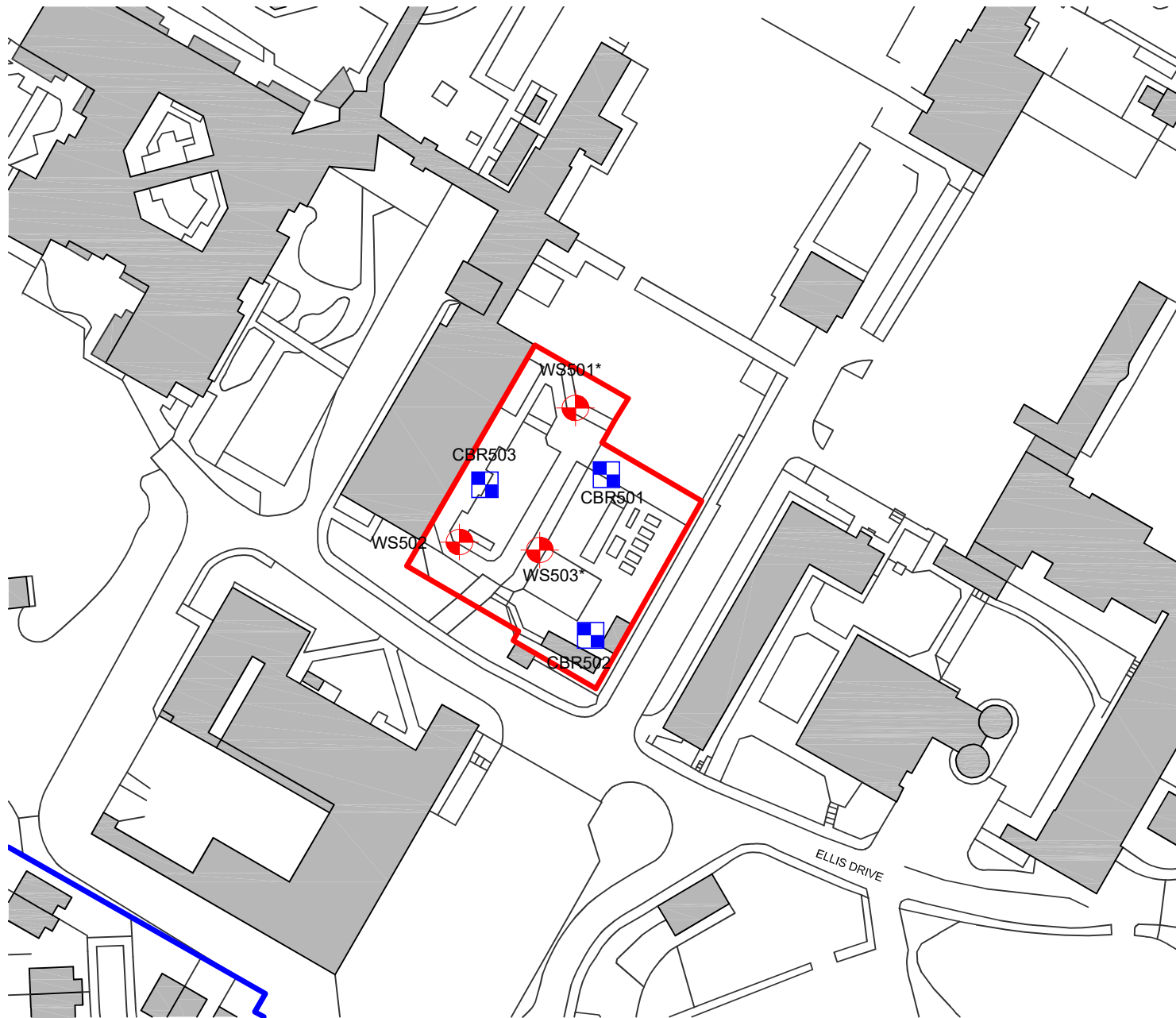
**TCP05 ASBESTOS DELINEATION
EXPLORATORY HOLE LOCATION PLAN**

Scale: NTS	Size: A3	First Issue: 30/04/2021	Drawn: PN	Checked: RA
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Drg No:

20200-CUR-XX-EX-DR-G-0002

Rev:



WINDOW SAMPLE BOREHOLE LOCATION UP TO 5M



CBR TEST

*

MONITORING LOCATION

Rev:	Description:	Date:	By:	Chkd:
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Status:

INFORMATION

Project:

NORTH MANCHESTER GENERAL HOSPITAL

Drg Title:

**EXPLORATORY HOLE LOCATION PLAN
TCP01**

Scale:	Size:	First Issue:	Drawn:	Checked:
NTS	A3	08/02/2021	PN	RA

Drg No:	Rev:
20200-CUR-XX-EX-DR-GE-0003	



Borehole Log

Borehole No.

WS101

Sheet 1 of 1

Project Name: Multi Storey Car Park NMGH

Project No.
076686.300

Co-ords: -

Hole Type
WS

Location: North Manchester General Hospital

Level:

Scale
1:20

Client: Bruntwood

Dates: 09/03/2021 -

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.12			ASPHALT	
		0.20	ES					MADE GROUND: Brown slightly sandy angular to subrounded fine to coarse gravel including brick, concrete and metal with moderate ash and cobble content. Cobbles are angular of brick and intact bricks.	
		1.20		N=29 (4,8/9,8,6,6)					1
		1.45 - 1.80	ES		1.40			Medium dense light brown slightly clayey fine to medium SAND.	
		2.00		N=11 (4,3/3,4,2,2)	1.70			Firm light brown slightly sandy slightly gravelly CLAY. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse including sandstone and mudstone.	2
		3.00		N=17 (4,4/6,4,4,3)	2.80			Medium dense light brown/orange fine to medium SAND.	
					3.00			End of borehole at 3.00 m	3
									4

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater at 1.00m bgl, no rise noted.





Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: Multi Storey Car Park NMGH

Project No.
076686.300

Co-ords: -

Hole Type
WS

Location: North Manchester General Hospital

Level:

Scale
1:20

Client: Bruntwood

Dates: 09/03/2021 -

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.12			ASPHALT	
		0.35	ES		0.30			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.	
								MADE GROUND: Dark brown very gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse including brick, slate and concrete. No recovery from 1.00m to 1.80m	
		1.20		N=13 (2,6/6,3,2,2)					1
					1.80				
					2.00			MADE GROUND: Intact bricks	
								End of borehole at 2.00 m	2
									3
									4

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater not encountered.





Borehole Log

Borehole No.

WS401

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 08/03/2021 - 08/03/2021

Logged By
PN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.10	ES		0.10			ASPHALT		
		0.20			0.20			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.		
		0.48			0.48			MADE GROUND: Black slightly sandy angular to subangular, fine to coarse gravel including concrete, brick and ceramic with a high ash content. Sand is coarse.		
		1.20	D	N=19 (3,4/4,6,5,4)	1.20			Medium dense light brown fine to medium SAND.		
		1.70 - 1.80		N=22 (3,5/5,5,7,5)	1.70			Stiff brown/grey slightly sandy slightly gravelly CLAY. Sand is medium to coarse. Gravel is subangular to subrounded, fine to coarse including sandstone and mudstone.		
		2.00								
		3.00		N=23 (4,6/5,6,6,6)						
		3.50 - 3.70		N=34 (3,5/6,8,11,9)	3.30			Very stiff dark brown occasionally grey slightly sandy laminated CLAY. Sand is medium to coarse.		
		4.00								
					4.40			End of borehole at 4.40 m		

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater not encountered.





Borehole Log

Borehole No.

WS402

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 08/03/2021 - 08/03/2021

Logged By
PN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	ES		0.10 0.17 0.50 0.71			ASPHALT	
								MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.	
		1.20		N=7 (1,2/2,1,2,2)	1.20			MADE GROUND: Dark brown slightly sandy angular to subangular fine to coarse gravel including brick, concrete and metal with moderate cobble content. Cobbles are angular of brick.	1
		2.00		N=13 (2,3/3,2,4,4)				MADE GROUND: Dark brown/black slightly gravelly clay. Gravel is angular to subrounded fine to coarse including ceramic, brick and ash.	
		2.20 - 2.30	D					Medium dense light brown fine to medium SAND.	2
		3.00		N=20 (3,3/5,5,4,6)	3.00			Firm dark brown slightly gravelly occasionally sandy CLAY. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse including sandstone and mudstone.	
		3.00 - 3.10	D		3.41			Medium dense slightly clayey medium to coarse SAND.	3
		4.00		N=29 (4,4/7,7,6,9)	3.78			Stiff brown occasionally mottled orange slightly sandy lamianted CLAY. Sand is medium to coarse.	
		4.50 - 5.00	B					Dense light brown/orange fine to medium sand with thin (1mm) black laminations.	4
		5.00		N=25 (6,5/5,6,8,6)	5.00			End of borehole at 5.00 m	5
									6
									7
									8
									9
									10

Remarks

Service inspection pit hand excavated from GL to 1.20m. Seepage at 2.00m bgl.





Borehole Log

Borehole No.

WS403

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

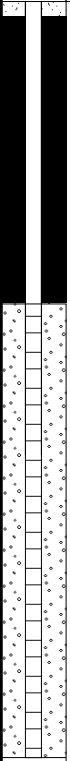
Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 09/03/2021 - 09/03/2021

Logged By
PN

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.07			GRASS over TOPSOIL: Brown slightly sandy clay with frequent rootlets and rare gravel. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of brick.	1
					0.80			MADE GROUND: Brown slightly sandy gravelly clay with moderate ash content. Sand is medium to coarse. Gravel is angular to subrounded fine to coarse including concrete, brick, clinker and wood.	
		1.20		N=10 (2,2/4,2,2,2)	1.20			Medium dense light brown medium to coarse SAND.	
		1.50 - 1.60	D					Firm brown/orange slightly sandy CLAY. Sand is fine to medium.	2
		2.00		N=6 (1,1/1,2,2,1)	2.00 2.10			Loose brown medium to coarse SAND.	
								Firm brown/orange slightly sandy CLAY. Sand is fine to medium.	3
		3.00		N=17 (2,3/4,5,4,4)	3.00			Stiff light brown sandy CLAY. Sand is medium to coarse.	
		3.40 - 3.50	D						
		4.00		N=26 (3,6/7,7,9,3)					4
					5.00				
End of borehole at 5.00 m									6
									7
									8
									9
									10

Remarks

Service inspection pit hand excavated from GL to 1.20m. Deposits damp at 2.00m bgl.





Borehole Log

Borehole No.

WS402A

Sheet 1 of 1

Project Name: North Manchester General
Hospital - TCP05Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	ES		0.09			MADE GROUND: Asphalt	
					0.17			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.	
					0.69			MADE GROUND: Dark brown slightly sandy gravel with frequent cobbles. Gravel is angular to sub-angular and fine to coarse of brick, concrete and metal. Cobbles are angular of brick.	
					0.70			MADE GROUND: Grey concrete End of borehole at 0.70 m	

Remarks

Service inspection pit hand excavated from GL to 0.70m. No groundwater encountered. Potential concrete slab at 0.70m bgl.





Borehole Log

Borehole No.

WS402B

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 30/03/2021 - 30/03/2021

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25	ES		0.10			MADE GROUND: Asphalt
					0.18			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.
								MADE GROUND: Dark brown slightly sandy gravel with frequent cobbles. Gravel is angular to sub-angular and fine to coarse of brick, concrete and metal. Cobbles are angular of brick.
				0.70			----- End of borehole at 0.70 m	



Borehole Log

Borehole No.

WS402C

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

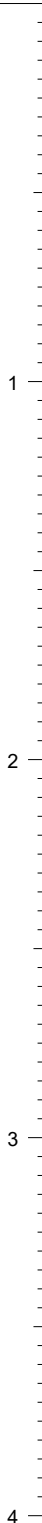
Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	ES		0.09			MADE GROUND: Asphalt	
					0.17			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.	
					0.28				
					0.40				
								MADE GROUND: Brick.	
End of borehole at 0.40 m									

Remarks

Service inspection pit hand excavated from GL to 0.40m. No groundwater encountered. Brick obstruction at 0.40m bgl.





Borehole Log

Borehole No.

WS402D

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	ES		0.09			MADE GROUND: Asphalt	
					0.17			MADE GROUND: Light brown/grey sandy angular to subrounded fine to medium gravel of aggregate, limestone and brick. Sand is medium to coarse.	
					0.67			MADE GROUND: Dark brown slightly sandy gravel with frequent cobbles. Gravel is angular to sub-angular and fine to coarse of brick, concrete and metal. Cobbles are angular of brick.	
					0.68			MADE GROUND: Grey concrete End of borehole at 0.68 m	

Remarks

Service inspection pit hand excavated from GL to 0.68m. No groundwater encountered. Potential concrete slab at 0.68m bgl.





Borehole Log

Borehole No.

WS403A

Sheet 1 of 1

Project Name: North Manchester General
Hospital - TCP05Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.10			TOPSOIL: Grass over brown slightly gravelly very sandy clay with frequent rootlets. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of brick and siltstone.	
					0.50			MADE GROUND: Brown very gravelly very clay sand. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of concrete, ash, brick, clinker and timber.	
					0.60			Light brown slightly clayey medium to coarse SAND.	
								----- End of borehole at 0.60 m -----	
									1
									2
									3
									4

Remarks

Service inspection pit hand excavated from GL to 0.70m. No groundwater encountered.





Borehole Log

Borehole No.

WS403B

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.09			TOPSOIL: Grass over brown slightly gravelly very sandy clay with frequent rootlets. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of brick and siltstone. MADE GROUND: Brown very gravelly very clay sand. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of concrete, ash, brick, clinker and timber.	
					0.80			Light brown slightly clayey medium to coarse SAND.	
					0.90			End of borehole at 0.90 m	

1

2

3

4

Remarks

Service inspection pit hand excavated from GL to 0.70m. No groundwater encountered.





Borehole Log

Borehole No.

WS403C

Sheet 1 of 1

Project Name: North Manchester General
Hospital - TCP05Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.10			TOPSOIL: Grass over brown slightly gravelly very sandy clay with frequent rootlets. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of brick and siltstone.	
					0.50			MADE GROUND: Brown very gravelly very clay sand. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of concrete, ash, brick, clinker and timber.	
					0.80			MADE GROUND: Black slightly clayey very gravelly silty sand. Sand is medium to coarse. Gravel is angular to sub-angular and fine to medium of brick.	
					0.90			Light brown slightly clayey medium to coarse SAND.	
								End of borehole at 0.40 m	

1

2

3

4

Remarks

Service inspection pit hand excavated from GL to 0.70m. No groundwater encountered.





Borehole Log

Borehole No.

WS403D

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP05

Project No.
076686

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:20

Client: Pennine Acute Trust

Dates: 01/04/2021 - 01/04/2021

Logged By
RT

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.10			TOPSOIL: Grass over brown slightly gravelly very sandy clay with frequent rootlets. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of brick and siltstone. MADE GROUND: Brown very gravelly very clay sand. Sand is medium to coarse. Gravel is angular to sub-rounded and fine to coarse of concrete, ash, brick, clinker and timber.	
					0.80 0.90			Light brown slightly clayey medium to coarse SAND. End of borehole at 0.68 m	1
									2
									3
									4

Remarks

Service inspection pit hand excavated from GL to 0.70m. No groundwater encountered.





Borehole Log

Borehole No.

WS501

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP01

Project No.
076686.104

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 15/03/2021 - 15/03/2021

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	ES		0.10 0.15 0.30 0.60			MADE GROUND: Block paving	
								MADE GROUND: Reddish brown medium to coarse sand.	
								MADE GROUND: Grey sandy angular to subrounded fine to medium gravel of mixed lithologies including limestone. Sand is medium to coarse.	
		1.10 1.20	D	N=2 (0,0/0,0,1,1)				MADE GROUND: Grey angular to subrounded medium to coarse gravel of limestone with moderate cobble content. Cobbles are angular of limestone.	1
					1.80			Very soft brown/grey laminated CLAY.	
		2.00		N=15 (3,3/4,5,3,3)	2.10 2.30			Firm light brown/grey slightly sandy CLAY. Sand is fine to medium.	2
								Medium dense grey/brown fine to medium clayey SAND. Deposit is wet.	
					2.80			Firm grey/brown very sandy CLAY. Sand is fine to medium.	
		3.00		N=32 (7,5/7,8,9,8)	3.40			Dense light brown clayey fine to medium SAND. <i>Deposit is wet.</i>	3
								Very dense light brown fine SAND with 1mm bands of fine coal gravel.	
		4.00		N=44 (9,11/11,12,11,10)				4	
		5.00		N=58 (13,13/14,15,14,15)				5	
					5.45				
End of borehole at 5.45 m									6
									7
									8
									9
									10

Remarks

Service inspection pit hand excavated from GL to 1.20m. Seepage at 0.60m bgl. Wet deposits encountered at 2.10m bgl and 3.00m bgl





Borehole Log

Borehole No.

WS502

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP01

Project No.
076686.104

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 15/03/2021 - 15/03/2021

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			MADE GROUND: Block paving	
					0.15			MADE GROUND: Reddish brown medium to coarse sand.	
		0.60	ES		0.45			MADE GROUND: Grey/brown angular to subangular coarse gravel of limestone.	
					1.00			MADE GROUND: Dark grey slightly gravelly clay. Gravel is angular to subrounded fine to coarse of mixed lithologies including ash, coal and brick.	1
		1.20	D	N=2 (1,0/0,0,1,1)	1.50			Very soft light brown slightly sandy CLAY with rare gravel. Sand is fine to medium. Gravel is angular to subrounded fine to coarse of mixed lithologies.	
		1.20			1.80			Loose light brown clayey fine to medium SAND.	2
		2.00		N=5 (1,0/0,1,2,2)				Medium dense light brown medium to coarse SAND with rare bands of fine gravel of coal.	
		3.00		N=16 (3,4/3,4,4,5)					3
					3.45				
								End of borehole at 3.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater not encountered.





Borehole Log

Borehole No.

WS503

Sheet 1 of 1

Project Name: North Manchester General Hospital - TCP01

Project No.
076686.104

Co-ords: -

Hole Type
WS

Location: Manchester

Level:

Scale
1:50

Client: Pennine Acute Trust

Dates: 15/03/2021 - 15/03/2021

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D	N=10 (3,3/2,2,3,3)	0.40 0.60			GRASS over TOPSOIL: Brown silty CLAY with frequent rootlets. Rare angular to subangular fine to coarse gravel including brick and coal.	1
		1.00 1.20	D				MADE GROUND: Grey brown angular to subangular fine to coarse gravel of limestone with moderate cobble content. Cobbles are angular of limestone.		
								Firm light brown slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is angular to subrounded fine to coarse gravel including coal.	2
		2.00		N=16 (4,4/4,4,4,4)				Medium dense light brown fine to medium SAND.	
		3.00		N=18 (4,3/4,4,5,5)	3.45				
End of borehole at 3.45 m									4
									5
									6
									7
									8
									9
									10

Remarks

Service inspection pit hand excavated from GL to 1.20m. Deposits damp at 2.00m bgl.





Contamination Test Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/02515
Issue Number: 1
Date: 18 March, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - MSCP
Project Ref: 076686
Order No: EBMA2726
Date Samples Received: 10/03/21
Date Instructions Received: 11/03/21
Date Analysis Completed: 18/03/21

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Richard Wong
Client Manager

Envirolab Job Number: 21/02515

Client Project Name: North Manchester General Hospital - MSCP

Client Project Ref: 076686

Lab Sample ID	21/02515/1	21/02515/2	21/02515/3					Units	Limit of Detection	Method ref
Client Sample No	WS101	WS101	WS102							
Client Sample ID										
Depth to Top	0.20	1.45	0.35							
Depth To Bottom										
Date Sampled	09-Mar-21	09-Mar-21	09-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AB	4A	2ABE							
% Stones >10mm _A	36.8	<0.1	32.2					% w/w	0.1	A-T-044
pH _D ^{M#}	9.88	8.80	8.95					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.28	0.03	0.04					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	9.7	0.3	4.5					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	3	1	3					mg/kg	1	A-T-024s
Boron (water soluble) _D	1.1	<1.0	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.8	<0.5	0.9					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	26	6	16					mg/kg	1	A-T-024s
Chromium _D ^{M#}	13	5	9					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	71	4	146					mg/kg	1	A-T-024s
Mercury _D	0.62	<0.17	1.34					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	17	5	10					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	70	18	83					mg/kg	5	A-T-024s

Envirolab Job Number: 21/02515

Client Project Name: North Manchester General Hospital -
MSCP

Client Project Ref: 076686

Lab Sample ID	21/02515/1	21/02515/2	21/02515/3					Units	Limit of Detection	Method ref
Client Sample No	WS101	WS101	WS102							
Client Sample ID										
Depth to Top	0.20	1.45	0.35							
Depth To Bottom										
Date Sampled	09-Mar-21	09-Mar-21	09-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AB	4A	2ABE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 21/02515

Client Project Name: North Manchester General Hospital - MSCP

Client Project Ref: 076686

Lab Sample ID	21/02515/1	21/02515/2	21/02515/3					Units	Limit of Detection	Method ref
Client Sample No	WS101	WS101	WS102							
Client Sample ID										
Depth to Top	0.20	1.45	0.35							
Depth To Bottom										
Date Sampled	09-Mar-21	09-Mar-21	09-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AB	4A	2ABE							
PAH-16MS										
Acenaphthene _A ^{M#}	0.54	<0.01	0.15					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.03	<0.01	0.05					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	1.09	<0.02	0.33					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	3.42	<0.04	1.92					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	3.57	<0.04	1.99					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	4.22	<0.05	2.20					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	1.58	<0.05	0.92					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.43	<0.07	0.77					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	3.15	<0.06	1.92					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.32	<0.04	0.20					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	6.05	<0.08	3.54					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.36	<0.01	0.09					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.88	<0.03	1.04					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.07	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	4.05	<0.03	1.31					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	7.19	<0.07	3.59					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	39	<0.08	20					mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/02515

Client Project Name: North Manchester General Hospital -
MSCP

Client Project Ref: 076686

Lab Sample ID	21/02515/1	21/02515/2	21/02515/3					Units	Limit of Detection	Method ref
Client Sample No	WS101	WS101	WS102							
Client Sample ID										
Depth to Top	0.20	1.45	0.35							
Depth To Bottom										
Date Sampled	09-Mar-21	09-Mar-21	09-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AB	4A	2ABE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	3	<1	<1					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	8	<1	2					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	43	<1	31					mg/kg	1	A-T-055s
Total Aliphatics _A	54	<1	34					mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1					mg/kg	1	A-T-055s
Aro >C12-C16 _A	6	<1	3					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	44	<1	21					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	179	<1	92					mg/kg	1	A-T-055s
Total Aromatics _A	230	<1	116					mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	284	<1	151					mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

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

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

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

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

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

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

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

Asbestos:

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

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

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/02515
Project:	North Manchester General Hospital - MSCP	Date Received:	11/03/2021 (pm)
Clients Project No:	076686	Cool Box Temperatures (°C):	6.2

NO DEVIATIONS IDENTIFIED

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

Final Test Report

Envirolab Job Number: 21/02515
Issue Number: 1

Date: 9-Apr-21

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - MSCP
Project Ref: 76686
Order No: EBMA2726

Date Samples Received: 10-Mar-21
Date Instructions Received: 11-Mar-21
Date Analysis Completed: 9-Apr-21

Notes - Soil analysis

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

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

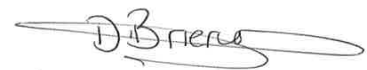
Please contact us if you need any further information.

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Danielle Brierley
Client Manager

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	21/02515/1				
Client Sample Number				WS101	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.2				
Depth to Bottom								
Date Sampled				09/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				4AB				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	9.89	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.2	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.06	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	4	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	4.44	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	39.3	100	-	-	
Mineral Oil (mg/kg) _A	A-T-007	N	N	107	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	0.041	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
				mg/l	mg/kg			
Arsenic	A-T-025	N	N	0.019	0.190	0.5	2	25
Barium	A-T-025	N	N	0.063	0.630	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.003	0.030	0.5	10	70
Copper	A-T-025	N	N	0.009	0.090	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.001	0.010	0.5	10	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	10	40
Lead	A-T-025	N	N	0.052	0.520	0.5	10	50
Antimony	A-T-025	N	N	0.013	0.130	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.032	0.320	4	50	200
Chloride	A-T-026	N	N	17	169	800	15000	25000
Fluoride	A-T-026	N	N	0.8	8.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	45	455	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	118	1180	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	9.0				
Conductivity (µS/cm)	A-T-037			235				
Mass Sample (kg)				0.214				
Dry Matter (%)	A-T-044	N	N	81.8				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	21/02515/2				
Client Sample Number				WS101	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				1.45				
Depth to Bottom								
Date Sampled				09/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				4A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.72	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.02	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.02	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	1.1	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	0.28	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08	100	-	-	
Mineral Oil (mg/kg) _A	A-T-007	N	N	<10	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
				mg/l	mg/kg			
Arsenic	A-T-025	N	N	0.002	0.020	0.5	2	25
Barium	A-T-025	N	N	0.040	0.400	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.003	0.030	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.002	0.020	0.5	10	30
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40
Lead	A-T-025	N	N	0.003	0.030	0.5	10	50
Antimony	A-T-025	N	N	0.007	0.070	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.005	0.050	4	50	200
Chloride	A-T-026	N	N	16	159	800	15000	25000
Fluoride	A-T-026	N	N	0.4	4.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	17	172	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	44	440	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	6.4				
Conductivity (µS/cm)	A-T-037	N	N	88				
Mass Sample (kg)				0.212				
Dry Matter (%)	A-T-044	N	N	82.6				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	21/02515/3				
Client Sample Number				WS102	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.35				
Depth to Bottom								
Date Sampled				09/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				2ABE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	9.03	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.49	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.06	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	2.5	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	1.31	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	20.3	100	-	-	
Mineral Oil (mg/kg) _A	A-T-007	N	N	81	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.005	0.050	0.5	2	25
Barium	A-T-025	N	N	0.120	1.200	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.001	0.010	0.5	10	70
Copper	A-T-025	N	N	0.005	0.050	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.002	0.020	0.5	10	30
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40
Lead	A-T-025	N	N	0.047	0.470	0.5	10	50
Antimony	A-T-025	N	N	0.006	0.060	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.023	0.230	4	50	200
Chloride	A-T-026	N	N	3	34	800	15000	25000
Fluoride	A-T-026	N	N	0.6	6.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	12	116	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	67	670	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	6.9				
Conductivity (µS/cm)	A-T-037	N	N	135				
Mass Sample (kg)				0.192				
Dry Matter (%)	A-T-044	N	N	91				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Final Test Report

Envirolab Job Number: 21/02516
Issue Number: 1

Date: 1-Apr-21

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - TCP05
Project Ref: 76686
Order No: EBMA2726

Date Samples Received: 10-Mar-21
Date Instructions Received: 11-Mar-21
Date Analysis Completed: 1-Apr-21

Notes - Soil analysis

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

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

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Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Holly Neary-King
Client Services Supervisor

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	21/02516/1	Landfill Waste Acceptance Criteria Limits			
Client Sample Number				WS401	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.35				
Depth to Bottom								
Date Sampled				08/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				2AE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.37		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.16		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.02		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	8.8		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	7.51		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	53.6		100	-	-
Mineral Oil (mg/kg) _A	A-T-007	N	N	48		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.010	0.100	0.5	2	25
Barium	A-T-025	N	N	0.046	0.460	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.024	0.240	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.004	0.040	0.5	10	30
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40
Lead	A-T-025	N	N	0.056	0.560	0.5	10	50
Antimony	A-T-025	N	N	0.003	0.030	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.011	0.110	4	50	200
Chloride	A-T-026	N	N	8	76	800	15000	25000
Fluoride	A-T-026	N	N	0.8	8.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	7	66	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	59	590	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	119				
Mass Sample (kg)				0.204				
Dry Matter (%)	A-T-044	N	N	85.7				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	21/02516/2	Landfill Waste Acceptance Criteria Limits			
Client Sample Number				WS402	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.25				
Depth to Bottom								
Date Sampled				09/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				2ABE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	11.06		>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.43	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.17	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	9.1	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	1.56	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	7.92	100	-	-	
Mineral Oil (mg/kg) _A	A-T-007	N	N	183	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.004	0.040	0.5	2	25
Barium	A-T-025	N	N	0.016	0.160	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.002	0.020	0.5	10	70
Copper	A-T-025	N	N	0.005	0.050	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40
Lead	A-T-025	N	N	<0.001	<0.01	0.5	10	50
Antimony	A-T-025	N	N	0.007	0.070	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.002	0.020	4	50	200
Chloride	A-T-026	N	N	15	145	800	15000	25000
Fluoride	A-T-026	N	N	0.5	5.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	19	189	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	198	1980	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	11.3				
Conductivity (µS/cm)	A-T-037	N	N	395				
Mass Sample (kg)				0.184				
Dry Matter (%)	A-T-044	N	N	95.1				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	21/02516/3	Landfill Waste Acceptance Criteria Limits			
Client Sample Number				WS403	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.15				
Depth to Bottom								
Date Sampled				08/03/2021				
Sample Type				Soil - ES				
Sample Matrix Code				2ABE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.24		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.38		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.15		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	3.4		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	1.82		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	1.61		100	-	-
Mineral Oil (mg/kg) _A	A-T-007	N	N	<10		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.001	0.010	0.5	2	25
Barium	A-T-025	N	N	0.154	1.540	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.029	0.290	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.002	0.020	0.5	10	30
Nickel	A-T-025	N	N	0.003	0.030	0.4	10	40
Lead	A-T-025	N	N	0.087	0.870	0.5	10	50
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.065	0.650	4	50	200
Chloride	A-T-026	N	N	14	143	800	15000	25000
Fluoride	A-T-026	N	N	1.3	13.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	39	392	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	<20	<200	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	24.90	249	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.1				
Conductivity (µS/cm)	A-T-037	N	N	29				
Mass Sample (kg)				0.219				
Dry Matter (%)	A-T-044	N	N	79.9				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/02516
Issue Number: 1
Date: 01 April, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - TCP05
Project Ref: 076686
Order No: EBMA2726
Date Samples Received: 10/03/21
Date Instructions Received: 11/03/21
Date Analysis Completed: 01/04/21

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Danielle Brierley
Client Manager

Envirolab Job Number: 21/02516

Client Project Name: North Manchester General Hospital - TCP05

Client Project Ref: 076686

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3					Units	Limit of Detection	Method ref
Client Sample No	WS401	WS402	WS403							
Client Sample ID										
Depth to Top	0.35	0.25	0.15							
Depth To Bottom										
Date Sampled	08-Mar-21	09-Mar-21	08-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	2AE	2ABE	2ABE							
% Stones >10mm _A	46.5	<0.1	<0.1					% w/w	0.1	A-T-044
pH _D ^{M#}	8.37	11.06	7.24					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.03	0.05	<0.01					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	12.9	2.7	3.1					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	29	3	8					mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	1.3	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.8	0.9	1.0					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	109	17	34					mg/kg	1	A-T-024s
Chromium _D ^{M#}	13	16	14					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	211	77	48					mg/kg	1	A-T-024s
Mercury _D	0.70	0.73	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	35	16	22					mg/kg	1	A-T-024s
Selenium _D ^{M#}	1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	73	79	60					mg/kg	5	A-T-024s

Envirolab Job Number: 21/02516

Client Project Name: North Manchester General Hospital - TCP05

Client Project Ref: 076686

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3					Units	Limit of Detection	Method ref
Client Sample No	WS401	WS402	WS403							
Client Sample ID										
Depth to Top	0.35	0.25	0.15							
Depth To Bottom										
Date Sampled	08-Mar-21	09-Mar-21	08-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	2AE	2ABE	2ABE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	Chrysotile	Crocidolite & Chrysotile							A-T-045
Asbestos Matrix (microscope) ₀	-	Loose Fibres	Loose Fibres							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A							A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	-	0.003	0.003					% w/w	0.001	A-T-054

Envirolab Job Number: 21/02516

Client Project Name: North Manchester General Hospital - TCP05

Client Project Ref: 076686

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3					Units	Limit of Detection	Method ref
Client Sample No	WS401	WS402	WS403							
Client Sample ID										
Depth to Top	0.35	0.25	0.15							
Depth To Bottom										
Date Sampled	08-Mar-21	09-Mar-21	08-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	2AE	2ABE	2ABE							
PAH-16MS										
Acenaphthene _A ^{M#}	0.21	0.06	0.01					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.23	0.02	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.56	0.15	0.02					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	4.49	0.74	0.17					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	7.84	0.69	0.16					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	8.15	0.80	0.20					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	4.68	0.33	0.07					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	2.83	0.25	<0.07					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	4.36	0.72	0.17					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.82	0.08	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	4.99	1.44	0.28					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.14	0.05	<0.01					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	5.38	0.38	0.09					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.20	0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	1.51	0.63	0.13					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	6.09	1.43	0.27					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	52.5	7.80	1.57					mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/02516

Client Project Name: North Manchester General Hospital - TCP05

Client Project Ref: 076686

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3					Units	Limit of Detection	Method ref
Client Sample No	WS401	WS402	WS403							
Client Sample ID										
Depth to Top	0.35	0.25	0.15							
Depth To Bottom										
Date Sampled	08-Mar-21	09-Mar-21	08-Mar-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	2AE	2ABE	2ABE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<10	2	<1					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	10	6	1					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	156	62	15					mg/kg	1	A-T-055s
Total Aliphatics _A	167	70	16					mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	2	1					mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	1	<1					mg/kg	1	A-T-055s
Aro >C12-C16 _A	<10	6	2					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	67	21	6					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	307	76	23					mg/kg	1	A-T-055s
Total Aromatics _A	390	106	33					mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	556	176	49					mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

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

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

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

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

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

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

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

Asbestos:

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

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

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG
Project: North Manchester General Hospital - TCP05
Clients Project No: 076686

Project No: 21/02516
Date Received: 11/03/2021 (am)
Cool Box Temperatures (°C): 6.1 & 6.2

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3
Client Sample No	WS401	WS402	WS403
Client Sample ID/Depth	0.35m	0.25m	0.15m
Date Sampled	08/03/21	09/03/21	08/03/21
Deviation Code			
F	✓	✓	✓

Key

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

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/02516/1	21/02516/2	21/02516/3
Client Sample No	WS401	WS402	WS403
Client Sample ID/Depth	0.35m	0.25m	0.15m
Date Sampled	08/03/21	09/03/21	08/03/21
PAH (total 17)	✓	✓	✓
BTEX (total)	✓	✓	✓

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

FINAL ANALYTICAL TEST REPORT SUPPLEMENT TO TEST REPORT 21/02828/1

Amendments: Request for project/sample information change

Envirolab Job Number: 21/02828
Issue Number: 2
Date: 30 March, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - TCPOI
Project Ref: 076686
Order No: EBMA2741
Date Samples Received: 16/03/21
Date Instructions Received: 18/03/21
Date Analysis Completed: 29/03/21

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/02828

Client Project Name: North Manchester General Hospital - TCPOI

Client Project Ref: 076686

Lab Sample ID	21/02828/1	21/02828/2	21/02828/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS501	WS502	WS503							
Depth to Top	0.25	0.60	0.20							
Depth To Bottom										
Date Sampled	15-Mar-21	15-Mar-21	15-Mar-21							
Sample Type	Soil - D	Soil - D	Soil - D							
Sample Matrix Code	4A	6A	2AE							
% Stones >10mm _A	37.9	<0.1	12.8					% w/w	0.1	A-T-044
pH _D ^{M#}	9.72	7.69	8.04					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	2.9	2.5	6.7					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	<1	6	12					mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	<0.5	<0.5	0.7					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	4	24	70					mg/kg	1	A-T-024s
Chromium _D ^{M#}	5	14	17					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	4	44	225					mg/kg	1	A-T-024s
Mercury _D	1.82	<0.17	1.40					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	2	16	17					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	3					mg/kg	1	A-T-024s
Zinc _D ^{M#}	16	43	126					mg/kg	5	A-T-024s

Envirolab Job Number: 21/02828

Client Project Name: North Manchester General Hospital - TCPOI

Client Project Ref: 076686

Lab Sample ID	21/02828/1	21/02828/2	21/02828/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS501	WS502	WS503							
Depth to Top	0.25	0.60	0.20							
Depth To Bottom										
Date Sampled	15-Mar-21	15-Mar-21	15-Mar-21							
Sample Type	Soil - D	Soil - D	Soil - D							
Sample Matrix Code	4A	6A	2AE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 21/02828

Client Project Name: North Manchester General Hospital - TCPOI

Client Project Ref: 076686

Lab Sample ID	21/02828/1	21/02828/2	21/02828/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS501	WS502	WS503							
Depth to Top	0.25	0.60	0.20							
Depth To Bottom										
Date Sampled	15-Mar-21	15-Mar-21	15-Mar-21							
Sample Type	Soil - D	Soil - D	Soil - D							
Sample Matrix Code	4A	6A	2AE							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	0.54					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	0.66					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	1.37					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	1.13					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	1.27					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	0.48					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	0.53					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	1.35					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	0.11					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	4.43					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	0.28					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	0.56					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	0.08					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	3.33					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	3.72					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	<0.08	19.8					mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/02828

Client Project Name: North Manchester General Hospital - TCPOI

Client Project Ref: 076686

Lab Sample ID	21/02828/1	21/02828/2	21/02828/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS501	WS502	WS503							
Depth to Top	0.25	0.60	0.20							
Depth To Bottom										
Date Sampled	15-Mar-21	15-Mar-21	15-Mar-21							
Sample Type	Soil - D	Soil - D	Soil - D							
Sample Matrix Code	4A	6A	2AE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	1					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1	2					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	1	4	15					mg/kg	1	A-T-055s
Total Aliphatics _A	1	4	19					mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	1					mg/kg	1	A-T-055s
Aro >C12-C16 _A	<1	<1	15					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<1	<1	73					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	<1	<1	172					mg/kg	1	A-T-055s
Total Aromatics _A	<1	<1	261					mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	1	4	280					mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

REPORT NOTES

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Analytical results reflect the quality of the sample at the time of analysis only.

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

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

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

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

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

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

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

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

Asbestos:

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

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

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/02828
Project:	North Manchester General Hospital - TCPOI	Date Received:	18/03/2021 (am)
Clients Project No:	076686	Cool Box Temperatures (°C):	9.2, 12.1

NO DEVIATIONS IDENTIFIED

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

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/03612
Issue Number: 1
Date: 12 April, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Philippa Neesham/Rob Allen
Project Name: North Manchester General Hospital - TCP05 Asbestos
Delineation
Project Ref: B076686
Order No: EBMA2779
Date Samples Received: 06/04/21
Date Instructions Received: 07/04/21
Date Analysis Completed: 11/04/21

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/03612

Client Project Name: North Manchester General Hospital -
TCP05 Asbestos Delineation

Client Project Ref: B076686

Lab Sample ID	21/03612/1	21/03612/2	21/03612/3	21/03612/4	21/03612/5	21/03612/6	21/03612/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS402A	WS402B	WS402C	WS402D	WS403A	WS403B	WS403C			
Depth to Top	0.25	0.25	0.25	0.25	0.15	0.15	0.15			
Depth To Bottom										
Date Sampled	01-Apr-21	30-Mar-21	01-Apr-21	01-Apr-21	01-Apr-21	01-Apr-21	01-Apr-21			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AB	4AB	4AB	6AE	4AE	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 21/03612

Client Project Name: North Manchester General Hospital -
TCP05 Asbestos Delineation

Client Project Ref: B076686

Lab Sample ID	21/03612/8									
Client Sample No										
Client Sample ID	WS403D									
Depth to Top	0.15									
Depth To Bottom										
Date Sampled	01-Apr-21									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

REPORT NOTES

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

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

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

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

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

Asbestos:

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

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

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

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Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

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Subscript "A" indicates analysis performed on the sample as received.

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Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/03612
Project:	North Manchester General Hospital - TCP05 Asbestos Delineation	Date Received:	07/04/2021 (am)
Clients Project No:	B076686	Cool Box Temperatures (°C):	5.2

NO DEVIATIONS IDENTIFIED

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



Curtins Generic Assessment Criteria

Adopted Soil Generic Assessment Criteria
Sandy loam with 2.5% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 <u>21</u>	6 <u>21</u>	1.8 <u>170</u>	33 <u>49</u>	7.7 <u>21</u>	220 <u>250</u>
Lead	<u>200</u>	<u>310</u>	<u>80</u>	<u>2,300</u>	<u>630</u>	<u>1,300</u>
Mercury (elemental)	1	1	26	26	16	26⁽⁸⁾ [30]
Mercury (inorganic)	170	240	80	3600	120	240
Nickel	130 ⁽¹⁰⁾	180 ⁽¹⁰⁾	53 ⁽¹¹⁾	980 ⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 <u>79</u>	170 <u>170</u>
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₆	78	78	1700	5900	590000	130000
EC ₆ - EC ₈	230	230	5600	17000	610000	220000
EC ₈ - EC ₁₀	65	65	770	4800	13000	18000
EC ₁₀ - EC ₁₂	330	330	4400	23000	13000	23000
EC ₁₂ - EC ₁₆	2400	2400	13000	82000	13000	25000
EC ₁₆ - EC ₃₅	92000	92000	270000	1700000	250000	480000
EC ₃₅ - EC ₄₄	92000	92000	270000	1700000	250000	480000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅ - EC ₇	140	690	27	46000	56000	84000
EC ₇ - EC ₈	290	1800	51	110000	56000	95000
EC ₈ - EC ₁₀	83	110	21	8100	5000	8500
EC ₁₀ - EC ₁₂	180	590	31	28000	5000	9700
EC ₁₂ - EC ₁₆	330	2300	57	37000	5100	10000
EC ₁₆ - EC ₂₁	540	1900	110	28000	3800	7700
EC ₂₁ - EC ₃₅	1500	1900	820	28000	3800	7800
EC ₃₅ - EC ₄₄	1500	1900	820	28000	3800	7800
Aliph + Arom EC >44-70	1800	1900	2100	28000	3800	7800
<i>Aromatic</i>						
Benzene	0.16	0.49	0.035	50	72	100
Ethyl benzene	150	380	39	1200⁽⁸⁾ [35000]	1200⁽⁸⁾ [24000]	1200⁽⁸⁾ [22000]
Toluene	270	1300	51	1900⁽⁸⁾ [110000]	1900⁽⁸⁾ [56000]	1900⁽⁸⁾ [95000]
Xylene ⁽⁹⁾	98	120	70	1200⁽⁸⁾ [14000]	1200⁽⁸⁾ [42000]	1200⁽⁸⁾ [23000]
Phenol	290	420	140	1500⁽¹⁴⁾ (35000)	1500⁽¹⁴⁾ (10000)	1500⁽¹⁴⁾ (8300)
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	5.6	5.6	10	460	4900	1900
Acenaphthylene	420	4600	69	97000	15000	30000
Acenaphthene	510	4700	85	97000	15000	30000
Fluorene	400	3800	67	68000	9900	20000
Phenanthrene	220	1500	38	22000	3100	6200
Anthracene	5400	35000	950	540000	74000	150000
Fluoranthene	560	1600	130	23000	3100	6300
Pyrene	1200	3800	270	54000	7400	15000
Benz(a)anthracene	11	14	6.5	170	29	56
Chrysene	22	31	9.4	350	57	110
Benzo(b)fluoranthene	3.3	4.0	2.1	44	7.2	15
Benzo(k)fluoranthene	93	110	75	1200	190	410
Benzo(a)pyrene	2.7	3.2	2	35	5.7	12
Indeno(123cd)pyrene	36	46	21	510	82	170
Dibenzo(ah)anthracene	0.28	0.32	0.27	3.6	0.57	1.3
Benzo(ghi)perylene	340	360	470	4000	640	1500
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.00087	0.001	0.001	0.077	3.5	5
Trichloroethene (TCE)	0.034	0.036	0.091	2.6	120	91
1,1,1,2 Tetrachlorethane	2.8	3.5	1.9	250	1400	1800
Tetrachlorethane (PCE)	0.39	0.4	1.5	42	1400	1100
1,1,1 Trichlorethane	18	18	110	1300	140000	76000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 2.5% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA / [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable