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MMU SCIENCE & ENGINEERING

PHASE 4 VALIDATION REPORT

Curtins Ref: **069656-CUR-00-XX-RP-Z-00004**
Revision: P02
Issue Date: 30 May 2024

Client Name: Bowmer & Kirkland

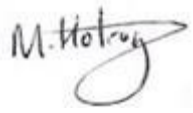
Client Address: North West Regional Office, 1st Floor, Attitude, Atlas Business Park, Manchester, M22 5PR

Site Address: Manchester Metropolitan University, John Dalton Building, Chester Street, Manchester, M1 5GD

Rev	Description	Issued by	Checked	Date
P01	Interim	LW	NF	27 October 2023
P02	Final Verification Report following additional validation visits and testing	NF	MH	30 May 2024

This report has been prepared for the sole benefit, use, and information for the client. The liability of Curtins Consulting Limited with respect to the information contained in the report will not extend to any third party.

Author	Signature	Date
L Woods BSc (Hons) MSc Graduate Geo-Environmental Engineer		30 May 2024
J Provis BSc MSc FGS Graduate Geo-Environmental Engineer		27 October 2023

Reviewed	Signature	Date
M Holroyd BSc (Hons) MSc Senior Geo-Environmental Engineer		30 May 2024

Authorised	Signature	Date
N Farnworth BSc (Hons) MCIWEM Principal Geo-Environmental Engineer		30 May 2024

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EXECUTIVE SUMMARY

Curtins were instructed by Bowmer & Kirkland (the Client) to produce a Verification Report following completion of remediation activities at a site at Manchester Metropolitan University's campus in Manchester to be developed for a Science & Engineering building. The site is located off Chester Street, approximately centred on National Grid Reference 384130, 397240.

This Verification Report has been compiled to provide a descriptive and factual record of the remedial works undertaken by Bowmer & Kirkland, and the subsequent verification of these works by Curtins.

It is envisaged that this document will be used to support the discharging of planning condition number 6b of planning permission 125799/FO/2019 in line with the measures agreed with the Local Planning Authority (LPA).

Site assessment works previously determined that remedial measures were required to be incorporated into the development as follows:

- Appropriate PPE for construction staff and suitable asbestos management measures during construction.
- Use of a clean and inert growing medium of 300mm of topsoil/subsoil with an underlying geotextile/break layer due to post-demolition investigation and enabling works identifying asbestos fibres and ACM across the site in Made Ground deposits.
- Installation of appropriate water supply pipes, this should comprise 'barrier pipe' subject to agreement with United Utilities.

Measures for dealing with unexpected contamination appropriately were also recommended.

Due to programme and sequencing constraints of the external works the capping works were not fully complete at the time of first issue of this report (October 2023), with Curtins only having verified the completed areas only. Curtins enquired with Manchester City Council's Contaminated Land Officer if a strategy can be agreed to allow discharge of Condition 6b and subsequently provide additional validation information when available. Following completion of the capping works Curtins have validated all remaining locations (May 2024) previously excluded from the interim report. This report has been updated accordingly.

Bowmer & Kirkland were the Main Contractor on site, and Complete Regeneration Ltd carried out the groundworks activities on their behalf.

Bowmer & Kirkland have confirmed that there was unexpected contamination encountered during groundworks in the form of contaminated soils with elevated concentrations of heavy metals and TPH's associated with buried tanks as well as asbestos sheeting. These were excavated and removed from the site as reported on in Curtins Remediation Strategy. Hazardous waste consignment tickets are enclosed in this report. It is understood that no further unexpected contamination was encountered.

Remediation works have now been completed with details and records of the works undertaken at the site collated herein from information provided by Bowmer & Kirkland and obtained by Curtins through a site inspection visits on 19/07/2023, 03/08/2023 and 17/05/2024.Through independent verification and consideration of the available evidence Curtins can confirm the following:

- The engineered capping layer has typically been installed in soft landscaped areas at or at a thickness greater than that specified in the Curtins Remediation Strategy.
- A geotextile was typically identified beneath topsoil and subsoil. It was not possible to positively identify a geotextile underlying soils in all locations as the full extent of engineered capping had not been excavated during validation due to depth, particularly in areas such as tree pits. Notwithstanding, engineered capping thickness in these areas has evidently been placed in excess of the 300mm requirements.
- The installed engineered capping layer in soft landscaped areas provides a sufficient barrier between the original Made Ground site soils and the end-users of the site.
- Imported topsoil source testing and on-site testing has been undertaken in accordance with both the Curtins Remediation Strategy and Curtins General Assessment Criteria. Results have been screened against suitable screening criteria and no exceedances have been found, the soil may be considered clean and suitable for use in the development.
- 'Protecta-Line' barrier water supply pipes have also been installed on site.

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1 INTRODUCTION

This verification report has been prepared by Curtins for Bowmer & Kirkland (the Client) to provide a descriptive and factual record of the works undertaken as evidence that the requirements of the agreed upon Remediation Strategy have been met at the site. It is understood the development will include a new Science & Engineering Building for Manchester Metropolitan University with external areas of hardstanding and soft landscaping.

The landscape architect plans are included within *Appendix A* of this report.

It is intended that this report is submitted to allow the discharge of Planning Condition 6b, associated with Application Ref. 125799/FO/2019.

Planning Condition 6b reads:

> *"When the development within each phase commences (except for demolition and clearance to the current ground level), the development shall be carried out in accordance with the previously agreed Remediation Strategy and a Completion/Verification Report shall be submitted to and approved in writing by the City Council as local planning authority."*

Details and records of remedial works undertaken at the site have been collated herein from information provided by Bowmer & Kirkland and obtained by Curtins through site visits.

Due to programme and sequencing constraints of the external works the engineered capping works to soft landscaped areas have been completed in separate stages. This verification report serves as an update to the initial verification report issued in October 2023 (P01), and includes verification of all of the remedial works undertaken.

1.1 Requirements of the Verification Report

This verification report is to account for the following;

- A descriptive and factual record of the remedial works (removal of unacceptable materials, provision of engineered capping layer comprising a clean soil layer and geotextile separation layer and installation of appropriate water piping) undertaken by the contractor and their appointed sub-contractors;
- Verification of completed remedial works
    - Photographic record of ground works activities;
    - Records of any other significant visual or olfactory evidence of contamination encountered during site clearance and excavations;
    - Waste consignment notes for hazardous materials removed from site;
    - Imported soil quality certificates, including soil chemical analysis;
    - Suitable thickness (>300mm) of imported topsoil, underlain by geotextile separation layer; and,
    - Installation of appropriate water supply pipes, agreed upon by United Utilities.

1.2 References

The Verification Report has been prepared with reference to the following reports:

- Reference 1: Curtins (2021) MMU Science & Engineering Remediation Strategy (Ref. 069656-CUR-00-XX-RP-GE-003).
- Reference 2: Curtins (2018) Phase 1 Preliminary Ground Investigation, MMU Science & Engineering, Manchester (Ref. 1338B-CUR-ZZ-RP-C-000001).
- Reference 3: Curtins (2020) Phase 2 Ground Investigation, MMU Science & Engineering, Manchester (Ref. 069656-CUR-00-XX-RP-GE-002-P05).

1.3 Project Background

A Phase 1 Preliminary Site Assessment Desktop Study (Ref. 2) was undertaken for the site by Curtins in 2018. A Ground Investigation was subsequently undertaken on site by Curtins in 2020 with an associated Phase 2 Ground Investigation Report issued (Ref. 3).

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The above works concluded the following pollutant linkages (outlined in Table 1) were considered to present a potential risk to human health and would require specific remedial measures to enable to safe redevelopment of the site for its proposed end-use.

Table 1 – Potential Pollutant Linkages

PPL	Source	Pathway	Receptor	Risk
1	Made Ground soils containing elevated loose asbestos fibres and / or asbestos containing material	**Construction Workers**	Inhalation and / or ingestion with contaminants in soil and soil-derived dust from on-site Made Ground.	Appropriate PPE for construction staff and suitable asbestos management measures during construction.
2	Made Ground soils containing asbestos fibres / asbestos containing materials	**End Users**	Inhalation and / or ingestion with contaminants in soil and soil-derived dust from on-site Made Ground.	Given post-demolition investigation and enabling works identified further asbestos fibres and ACM across the site, it is recommended that in all soft Landscape Areas overlying Made Ground – a clean and inert growing medium of 300mm of topsoil / subsoil with an underlying geotextile / break layer is provided.
3	Made Ground soils containing elevated concentrations of TPHs above UKWIR thresholds.	**End Users**	Chemical attack of potable water supply pipes and subsequent infiltration from contaminants on site, followed by ingestion.	Ensure appropriate water supply pipes are used, this should comprise 'barrier pipe' subject to agreement with United Utilities.

To address the elevated risks the proposed remediation works were detailed in the Curtins Remediation Strategy (Ref.1).

For further background details the previous reports referenced above should be consulted. It is assumed that the Client is in receipt of these reports and that they have also been submitted to and accepted by Manchester City Council to discharge relevant planning conditions.

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2 REMEDIAL WORKS UNDERTAKEN

In this document the term 'remediation' is used to define specific works required to address the potential issues arising from asbestos fibres, and contaminated soils, with due account taken for the proposed end-user.

In order to address the risk from elevated concentrations of volatile and non-volatile contamination in soils including asbestos containing materials the following remedial measures were outlined to be required.

- **Remedial Action 1:** Contamination and Asbestos Management during Construction.
- **Remedial Action 2:** Engineered Capping.
- **Remedial Action 3:** Use of Suitable Water Supply Pipes.

Measures were also provided for dealing appropriately with unexpected contamination encountered on site, through the use of a Strategy for Handling Potentially Contaminated Soils and Contaminative Incidents on Site.

Bowmer & Kirkland are the Principal Contractor on site, with Complete Regeneration Ltd. employed as the groundworks contractor. Remedial works undertaken to date as are detailed below.

2.1 Remedial Action 1 – Contamination and Asbestos Management during Construction

Remedial Action 1 required safe management of Asbestos Containing Materials (ACMs) and ACM debris identified during the Curtins Phase 2 Site Investigation (Ref. 3).

Potential Pollutant Linkage 1 identified at the site relates to the inhalation and / or ingestion of contaminants in soil and soil-derived dust from on-site Made Ground to construction workers. It was determined that remedial measures were required due to the presence of asbestos in the form of fibres, loose insulation, and asbestos cement.

2.1.1 Asbestos Management, Unexpected Contamination & Contaminative Incidents

As reported in Curtins Remediation Strategy, Complete Regeneration Ltd (Bowmer & Kirkland's subcontractor) carried out demolition and enabling works. Curtins were not present on-site during groundworks activities but visited to inspect arisings from buried tank removal and observe additional trial pits. Findings were reported within Curtins Remediation Strategy (Ref.1).

Consignment notes for the materials removed from site were requested by Manchester City Council's Contaminated Land Team. The consignment notes are summarised below and enclosed in *Appendix D*.

As part of works, a total of '8 bags' of Chrysotile Cement was removed from the site, with the relevant hazardous waste consignment ticket provided, included in *Appendix D*.

A total of two loads of hazardous materials were removed from site during the groundworks, described in *Table 2*.

Table 2 – Summary of Hazardous Materials Removed from Site

Waste Transfer Note	Description	Excavation Location	Quantity	Waste Facility
COMPLE/CR003	Soils Containing Hazardous Substances	Two tanks and a delineation trial pit.	18,680kg	Bradley Park Landfill Site, Lower Quarry Road, Huddersfield, HD2 1FN
MANCHE/00051	Construction Materials Containing Asbestos	MMU site.	8 bags	Foxhall Environmental Ltd Foxhall Farm Owler Lane Birstall WF17 9BW

No further unexpected contamination is understood to have been encountered during construction works.

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Complete Regenerations' Risk Assessment and Method Statement are included in *Appendix E* in full, which included their Environmental Controls used and control measures for managing asbestos on site. The following Plan of Works is included in the document, with respect to working with asbestos.

"Only trained and competent operatives will be involved in this operation. Firstly, the area will be fenced off and segregated from other activities. The area will be dampened down using either water cannon or jetwash. 2 operatives will wear white disposable overalls, FFP3 face masks, suitable gloves and wellies. They will safely enter the excavation, hand pick the ACM and place in the red bag. Then the red bag will be placed into a transparent bag. The double bagged ACM will then be collected by a fully licensed carrier and removed from site. The gloves and overalls used by the operatives will also be double bagged and removed from site. A consignment note will be in place for this activity and made available to the client."

The following precautionary and preventative measures are also included in the risk assessment:

- All personnel working with asbestos are to be trained in non-licensed asbestos removal.
- Asbestos containing products should be double bagged/wrapped and secured with duct tape then attach an asbestos sticker before collection from site.
- Cement asbestos products are to be removed whole whenever practicable to avoid the release of asbestos fibres.
- All personnel working with asbestos materials must wear FFP3 dust masks and category 3 type 5&6 disposable overalls. These must be disposed of with asbestos products. Steel toe cap wellies must also be worn as these can be cleaned off.
- Drivers carrying asbestos waste should be in possession of a consignment note.

2.2 Remedial Action 2 – Engineered Capping

Remedial Action 2 required the installation of engineered capping due to the asbestos fibres and asbestos containing materials identified during the Curtins Phase 2 Site Investigation (Ref. 3) and identified during site enabling works.

Potential Pollutant Linkage 2 identified at the site relates to the inhalation and / or ingestion of contaminants in soil and soil-derived dust from on-site Made Ground by end users. It was determined that remedial measures were required due to the presence of asbestos in the form of fibres, loose insulation, and asbestos cement.

The locations of soft landscaping are highlighted in Reform Landscapes Drawing (Ref. 1338B-RFM-NB-00-DR-L-8001_C01) and NG Baileys Drawing (Ref. 1338B-NGB-XX-XX-DR-E-900002) included in *Appendix A.* An extract of the drawing, highlighting the landscaping areas, is presented in Figure 1.

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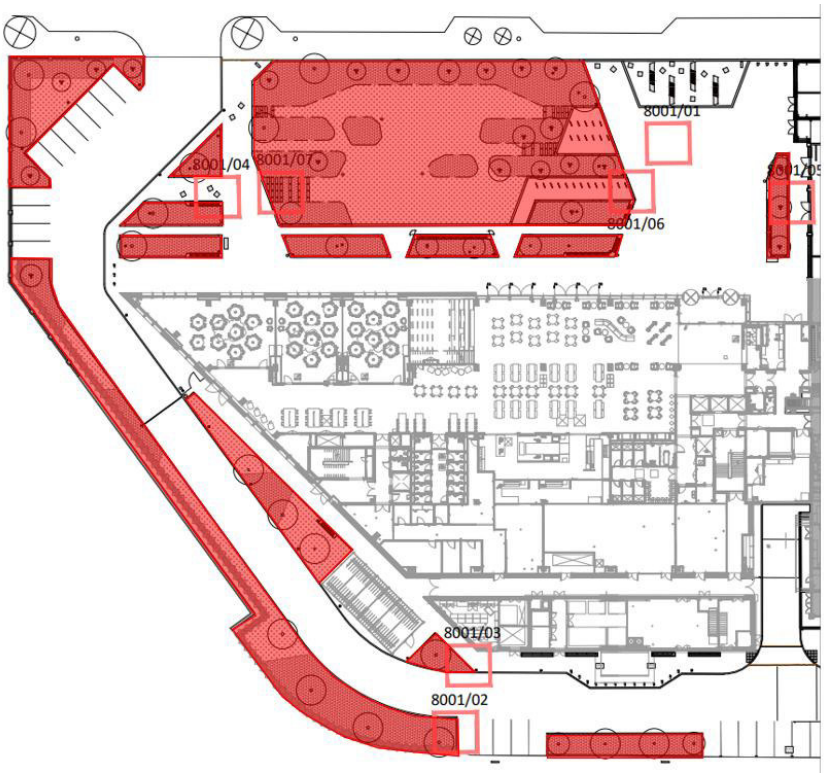


Figure 1 – Planned locations of engineered landscaping on the site.

Reform Landscape drawing ref. 1338B-RFM-NB-00-DR-L-8006, detailed in Appendix A, shows their planting build up specifications, detailed below in Table 3.

Table 3 – Summary of Reform Landscape Planter Specifications

Planting Specification ref. (Total Build Up Thickness)	Planter description	Growing medium and Planting Build up	Thickness (mm)
8006/01 (1,100mm)	Multi-stem tree in soft landscape	Topsoil	300
		Subsoil	600
		Geotextile membrane	-
		Gravel Drainage	200
8006/02 (1,100mm)	Single stem tree in soft landscape	Topsoil	300
		Subsoil	600
		Geotextile membrane	-
		Gravel Drainage	200
8006/03 (750mm)	Herbaceous planting in soft landscaping	Topsoil	300
		Subsoil	300
		Broken formation	150

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Planting Specification ref. (Total Build Up Thickness)	Planter description	Growing medium and Planting Build up	Thickness (mm)
8006/04 (600mm)	Amenity lawn	Topsoil	150
		Subsoil	300
		Broken formation	150
8006/05 (700mm)	Hedge planting	Topsoil	300
		Subsoil	300
		Broken formation	100

Hardstanding areas are considered sufficient to break the potential contaminant linkage and therefore no specific remediation measures were required.

Specifications 8006/3, 8006/4 and 8006/5 do not follow the Curtins specification due to the lack of geotextile membrane break layer underlying the subsoil. The capping thickness ranges between 450mm and 600mm which is significantly more than the Curtins specification. Notwithstanding this detail, B&K indicated that all soft landscaped areas will include a geotextile or gravel break layer as specified by Curtins.

Chemical testing of imported soils and depth verification to completed soft landscaped areas was undertaken to ensure remediation has been undertaken to demonstrate the effectiveness of the remediation as further discussed in Section 2.2.1 and 2.2.2. It was undertaken in general accordance with the verification and validation plan set out in Curtins Remediation Strategy (Ref. 1).

2.2.1 Validation of Imported Soil Quality

Topsoil and subsoil were understood to have been imported from a single source, known as *'Crown Farm',* presumed to be a greenfield/manufactured source.

Source chemical analysis testing was undertaken by the supplier, and laboratory testing certificates have been provided to Curtins for review and are enclosed in *Appendix C* (Tim O'Hare Associates, Report Ref. TOHA/23/7880/1/SS and TOHA/23/7880/2/SS). The topsoil sample was described as a dark yellowish brown, slightly moist, friable, non-calcareous loamy sand; and, the subsoil sample was described as a strong brown, slightly moist, friable, non-calcareous sand with a single grained structure. The soil samples are shown to be compliant with BS3882:2015 specification for topsoil multipurpose grade and BS8601:2013 specification for subsoil multipurpose grade, respectively. The soils were therefore considered to be suitable for import.

Imported topsoil inspected on-site comprised brown slightly gravelly sand with fragments of bark, and fine to coarse, subangular to subrounded gravel of mudstone. Imported subsoil inspected on-site comprised orangish brown fine to medium sand.

Curtins Remediation Strategy states that 1 sample per 200m^3 of greenfield topsoil/subsoil is required (minimum of 3 samples). B&K indicate that approximately 624m^3 of topsoil and 672m^3 of subsoil has been imported to site from single sources, with Curtins obtaining 4 samples from each in total as detailed below, and therefore meeting the specification see *Appendix A* for locations:

- 19th July 2023:
  - Topsoil Samples: TS01 (North), TS02 (East), TS03 (West),
  - Subsoil Samples: SS01, SS02, SS03 (West).
- 19th May 2024:
  - Topsoil Samples: TS101,
  - Subsoil Samples: SS101.

Testing was undertaken by Envirolab, a UKAS and MCERTs accredited laboratory, and schedule for the suite of analytes described in *Table 4.*

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Table 4 – Environmental Chemical Analysis Suite

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	0.17 mg/kg
	Cyanide (total)	1 mg/kg
	Phenols (screen)	0.2 mg/kg
	PAHs (USEPA 16)	0.01 – 0.08 mg/kg
	TPH (Aro/Ali Split)	0.01 to 1 mg/kg

Copies of the environmental chemistry testing certificates are presented in *Appendix C.* The screening criteria for which soil chemical testing results are to be assessed against, Curtins GACs: *Residential without Plant Uptake End-Use with SOM of 1%.*

No visual contaminants were evident on sampling and inspection, and each of the eight soil samples did not record any chemical concentrations which exceeded the nominated screening criteria.

The imported topsoil and subsoil is therefore deemed 'suitable for use'.

2.2.2 Validation of Engineered Capping Layer Thickness and Build Up

Independent inspection of the depth and quality of the imported topsoil and presence of a geotextile layer at the base has been conducted by Curtins on various occasions. During initial inspection in August 2023 capping works were ongoing but incomplete.

On 3rd August 2023, two areas of soft landscaping were validated at the locations shown in Curtins drawing ref. 069656-CUR-XX-XX-DR-GE-006-P02. No topsoil was in place during the inspection, however 600mm of subsoil was observed with a separation layer was in place at the base of both inspection pits. The required depth is 300mm, therefore without the topsoil the capping layer was identified to be double the required depth. In adjacent landscaped areas which had been partially constructed the presence of a geotextile and gravel break/drainage layer was evident. Additional, information was subsequently provided by Bowmer & Kirkland at this time.

Given works were incomplete during initial inspections Curtins recommended further depth inspection was undertaken on completion and provided proposed trial hole locations for outstanding areas. It was recommended that validation evidence is to be communicated to Manchester City Council's planning and contaminated land team for confirmation of acceptance on completion.

Capping works were subsequently completed in May 2024 with verification trial pits undertaken in the locations specified. The findings are summarised below in Table 5.

Table 5 – Summary of 2024 Validation Visit

Location Hand Pit Reference	Date	Thickness (mm)			Membrane Encountered	Pass / Fail	Notes
		Topsoil	Subsoil	Total			
Area 1 HP01	17/05/24	330	>250			**Pass**	Full extent of capping thickness not determined due to depth.

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Location Hand Pit Reference	Date	Thickness (mm) Topsoil	Subsoil	Total	Membrane Encountered	Pass / Fail	Notes
				>580	**No**		Membrane presence could not confirmed or otherwise however soil depth far exceeds requirements.
Area 2 HP01	17/05/24	300	-	300	**Yes**	**Pass**	-
Area 2 HP02	17/05/24	410	-	410	**Yes**	**Pass**	Capping of parts of Area 2 incomplete during visit. B&K provided additional photographic evidence on completion to show 500mm cover in these areas.
Area 3 HP01	17/05/24	410	-	>410	**No**	**Pass**	Plastic Pipe had been left in pre dug hole with services installed. Full depth of capping not determined.
Area 5 HP01	17/05/24	400	200	600	**Yes**	**Pass**	**-**
Area 5 HP02	17/05/24	300	>160	>460	**No (Tree pit)**	**Pass**	Full extent of capping thickness not determined due to depth. Membrane presence could not confirmed or otherwise however soil thickness far exceeds requirements.
Area 6 HP01	17/05/24	420	>70	>490	**No**	**Pass**	Full extent of capping thickness not determined due to depth. Membrane presence could not confirmed or otherwise however soil thickness exceeds requirements.
Area 6 HP02	17/05/24	240	>160	>400	**No**	**Pass**	Full extent of capping thickness not determined due to depth. Membrane presence could not confirmed or otherwise however soil thickness exceeds requirements.
Area 7 HP01	17/05/24	>630	-	>630	**No (Tree pit)**	**Pass**	Full extent of capping thickness not determined due to depth. Membrane presence could not confirmed or otherwise however soil thickness exceeds requirements.

From the inspection the capping thicknesses are consistent with the Landscape Architect Reform specifications.

B&K indicated that a geotextile would be included to all soft landscaped areas. It was not possible to positively identify a geotextile in all locations as the full extent of engineered capping had not been excavated during validation due to depth, particularly in areas such as tree pits. Notwithstanding, engineered capping thickness in these areas has evidently been placed well in excess of the 300mm requirements and therefore deemed sufficiently adequate as an

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engineered caping layer to break PCL 2 and provide a sufficient barrier between the original Made Ground site soils and the end-users of the site.

B&K have also provided photos of geotextile installation as included in Appendix B.

2.3 Remedial Action 3 – Use of Suitable Water Supply Pipes

Remedial Action 3 required the installation of suitable water supply pipes, agreed upon with United Utilities, due to Made Ground soils containing elevated concentrations of TPHs above UKWIR thresholds.

Potential Pollutant Linkage 3 identified at the site relates to the potential chemical attack of potable water supply pipes and subsequent infiltration from contaminants on site, followed by ingestion. It was determined that remedial measures were required due to the elevated TPH concentrations in the Made Ground soils in the form of barrier pipe.

2.3.1 Validation of Water Supply Pipes

Curtins carried out a United Utilities Water Supply Assessment which recommended the use of barrier pipe.

Curtins were not present on-site during installation of barrier pipe. The following details have been provided by Bowmer & Kirkland.

It was agreed upon with United Utilities that a 'Protecta-Line' barrier pipe (specification included in *Appendix F*) should be installed on the site due to elevated concentrations of TPH. In correspondence with Bowmer & Kirkland, evidence in the form of a photograph was provided (*Appendix B*) showing that the agreed upon contaminant resistant water supply piping was installed.

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3 CONCLUSION

Considering the available evidence (site visits by Curtins and photographs submitted by Bowmer & Kirkland) , Curtins can confirm the following:

- The engineered capping layer has typically been installed in soft landscaped areas at or at a thickness greater than that specified in the Curtins Remediation Strategy.
- A geotextile was typically identified beneath topsoil and subsoil. It was not possible to positively identify a geotextile underlying soils in all locations as the full extent of engineered capping had not been excavated during validation due to depth, particularly in areas such as tree pits. Notwithstanding, engineered capping thickness in these areas has evidently been placed in excess of the 300mm requirements.
- The installed engineered capping layer in soft landscaped areas is considered to provide a sufficient barrier between the original Made Ground site soils and the end-users of the site.
- Imported topsoil chemical testing has been undertaken both and source and on-site, in accordance with the Remediation Strategy. Results have been assessed against the relevant GACs and no exceedances have been found. Therefore, the soil may be considered clean and suitable for use in the development.
- The water supply piping installed meets the specification agreed with United Utilities.

Additionally, Bowmer & Kirkland have confirmed:

- Where any contaminated soils or asbestos containing materials / fibres were identified, these were removed from the site, and,
- No further unexpected contamination or contaminative incidents other than those described in Section 2.1.1 were identified during construction.

In the soft landscaping areas, the Potential Pollutant Linkages, identified in Section 1.3, no longer present an unacceptable risk to site users and visitors, and the site may be considered suitable for use.

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4 REFERENCES

1. Curtins (2021) MMU Science & Engineering Remediation Strategy (Ref. 069656-CUR-00-XX-RP-GE-003).
2. Curtins (2018) Phase 1 Preliminary Ground Investigation, MMU Science & Engineering, Manchester (Ref. 1338B-CUR-ZZ-RP-C-000001).
3. Curtins (2020) Phase 2 Ground Investigation, MMU Science & Engineering, Manchester (Ref. 069656-CUR-00-XX-RP-GE-002-P05).

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5 APPENDICES

Appendix A – Drawings

Appendix B – Photographic Records

Appendix C – Soil Analysis

Appendix D – Waste Consignment Tickets

Appendix E – Complete Regeneration RAMS

Appendix F – United Utilities Application

Appendix G – Barrier Pipe Specification

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Appendix A – Drawings

- Reform Landscapes (2023) Hard Landscape Details (Drawing Ref. 1338B-RFM-NB-00-DR-L-8001-C01).
- Curtins (2023) Hand Pit Locations Drawings Ref. 069656-CUR-XX-XX-DR-GE-006-P02.
- NG Bailey (2022) External Services (Drawing Ref. 1338B-NGB-XX-XX-DR-E-900002).

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Key

For all base and sub base details refer to engineers drawing and information 1338B-CUR-YY-GF-DR-C-900201

Paving and Surfacing

T1 - Precast Concrete Paving (Q25-335)
Size:300x100x80mm
T1.1 Edge course (Q25-335)

T2 - Natural Stone Paving Flags (Q25-310)
Size:400x200/400/600x80mm

PP - Precast Concrete Paving with CED spacers (Q25-335A)
Size:300x100x80mm

Ea - Exposed aggregate concrete surfacing (Q21-110)
refer to 1338B-RFM-NB-00-DR-L-8013
Exposed Aggregate Details

Ta - Tarmacadam road surfacing
to engineers details and specification

SS - Pre cast concrete stepping stones (Q25-120)
Size: 300mmx900mmx100mm

Kerbs and Edges

K1 - Conservation upstand kerb (Q10-110A)

K2 - Conservation Pin Flush Kerb (Q10-110C)

BE - Bespoke natural stone edge (Q10-120)
refer to drawing 1338B-RFM-NB-00-DR-L-8002

ME - Metal edge (Q10-113C)

Street Furniture (Q50)

S1 - Seating edge (Q50-225)
refer to 1338B-RFM-NB-00-DR-L-8008

SC - Seating cube (Q50-221)
refer to 1338B-RFM-NB-00-DR-L-8008

BS - Bicycle stand (Q50-210)

Planting (Q31)

PL - Proposed ornamental shrub planting
refer to 1338B-RFM-NB-00-DR-L-8006

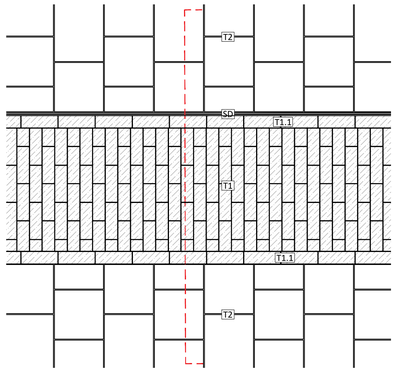
Drainage

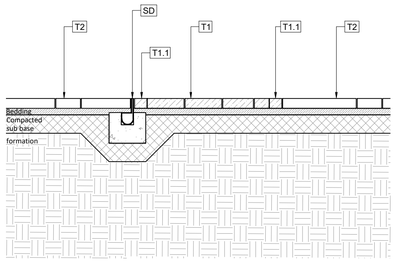
SD - Slot drain (Q10-170)
refer to Curtins details

Other

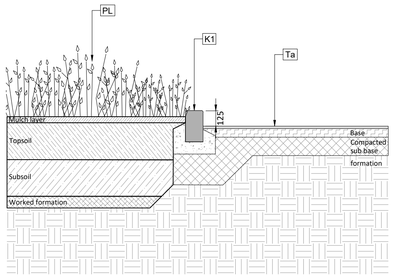
01 - Proposed lighting column
to M&E engineers specification

02 - Infill manhole cover
to engineers specification

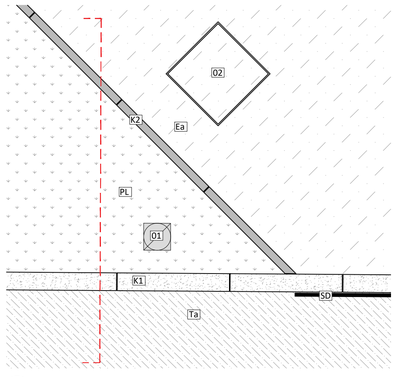


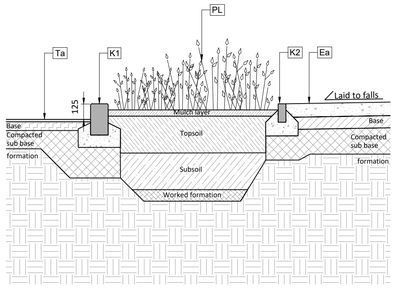


8001 01 Stone and concrete paving with linear slot drain 1:25

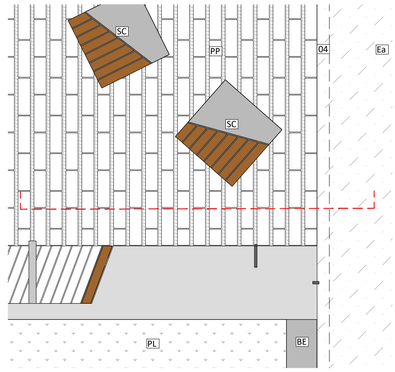


8001 02 Tarmacadam surface and lawn with concrete upstand kerb 1:25

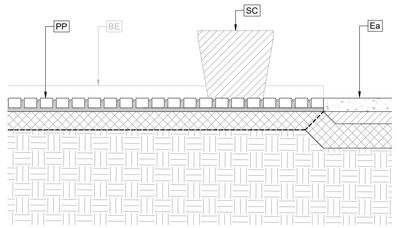


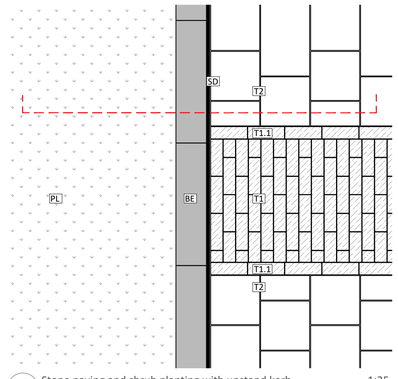


8001 03 Exposed aggregate and tarmacadam surface with concrete upstand and flush kerb 1:25

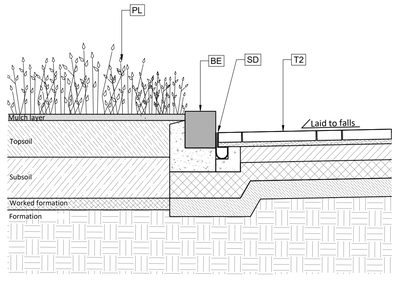


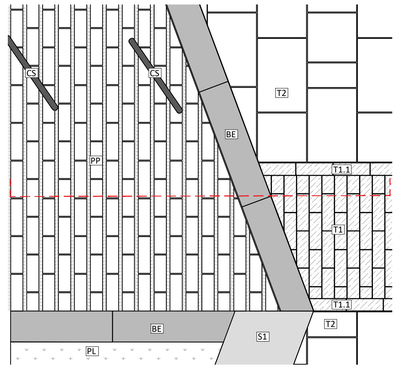
8001 04 Exposed aggregate and permeable concrete paving with 30mm grass infill 1:25



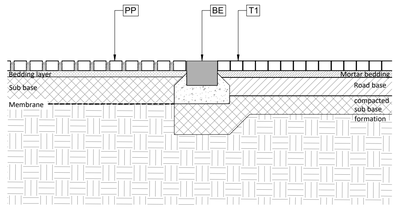


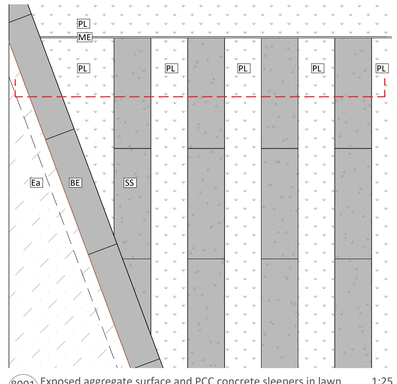
8001 05 Stone paving and shrub planting with upstand kerb 1:25



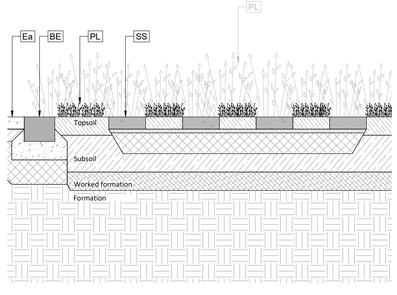


8001 06 Stone paving and permeable concrete paving with 30mm grass infill 1:25



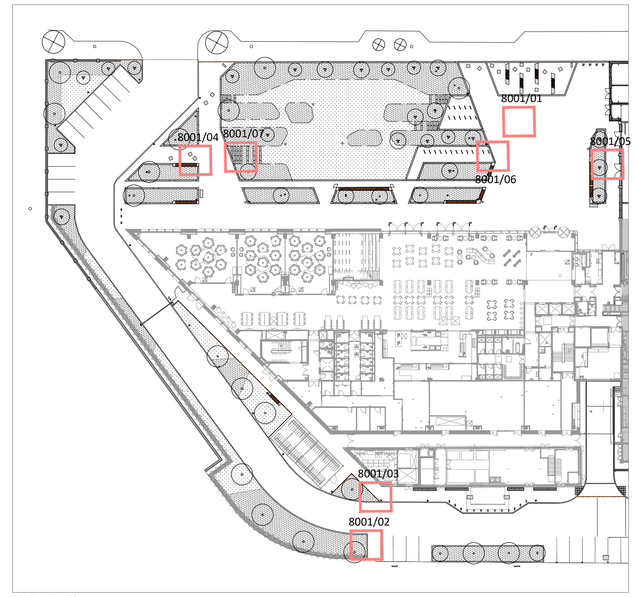


8001 07 Exposed aggregate surface and PCC concrete sleepers in lawn 1:25



Notes

1. All dimensions in mm, unless otherwise stated.
2. Scaling from drawing if printed incorrectly may lead to errors.
3. All information outside red line boundary shown for contextual purpose only.
4. All hatch patterns are indicative only unless stated otherwise.
5. This drawing is to be read in conjunction with the following re-form landscape architecture documentation:
   AND all relevant documentation from the design team
6. All works to be undertaken in accordance with British Standard BS 5837
7. The contractor is to check and verify all levels and dimensions against site survey information.
8. Any discrepancies in the design information are to be brought to the attention of re-form landscape architecture, in writing, prior to commencement of construction works.
9. All proprietary products shall be installed in strict accordance with manufacturers written instructions.
10. Refer to other consultants' drawings and specifications for the following design information:
    - Foundation details
    - Base course and/or sub bases design & specification
    - Waterproofing of any element
    - Levels & Drainage design and infrastructure
    - Lighting and ducting
    - Existing & proposed utilities



KEYPLAN NTS

Date	Description of revision	Drawn	Checked	Approved	Revision
27.06.23	Initial construction issue	SS/TD	TD	DL	C01

re-form
landscape architecture

Beehive Mill, Jersey Street,
Manchester M4 6JG
T: +44 (0)161 397 4953
E: info@re-formlandscape.com
W: re-formlandscape.com

Project
MMU SCIENCE AND ENGINEERING BUILDING
RF20-823

Client
BOWMER AND KIRKLAND

Document title
HARD LANDSCAPE DETAILS

Paper size
A1

Scale
1:25

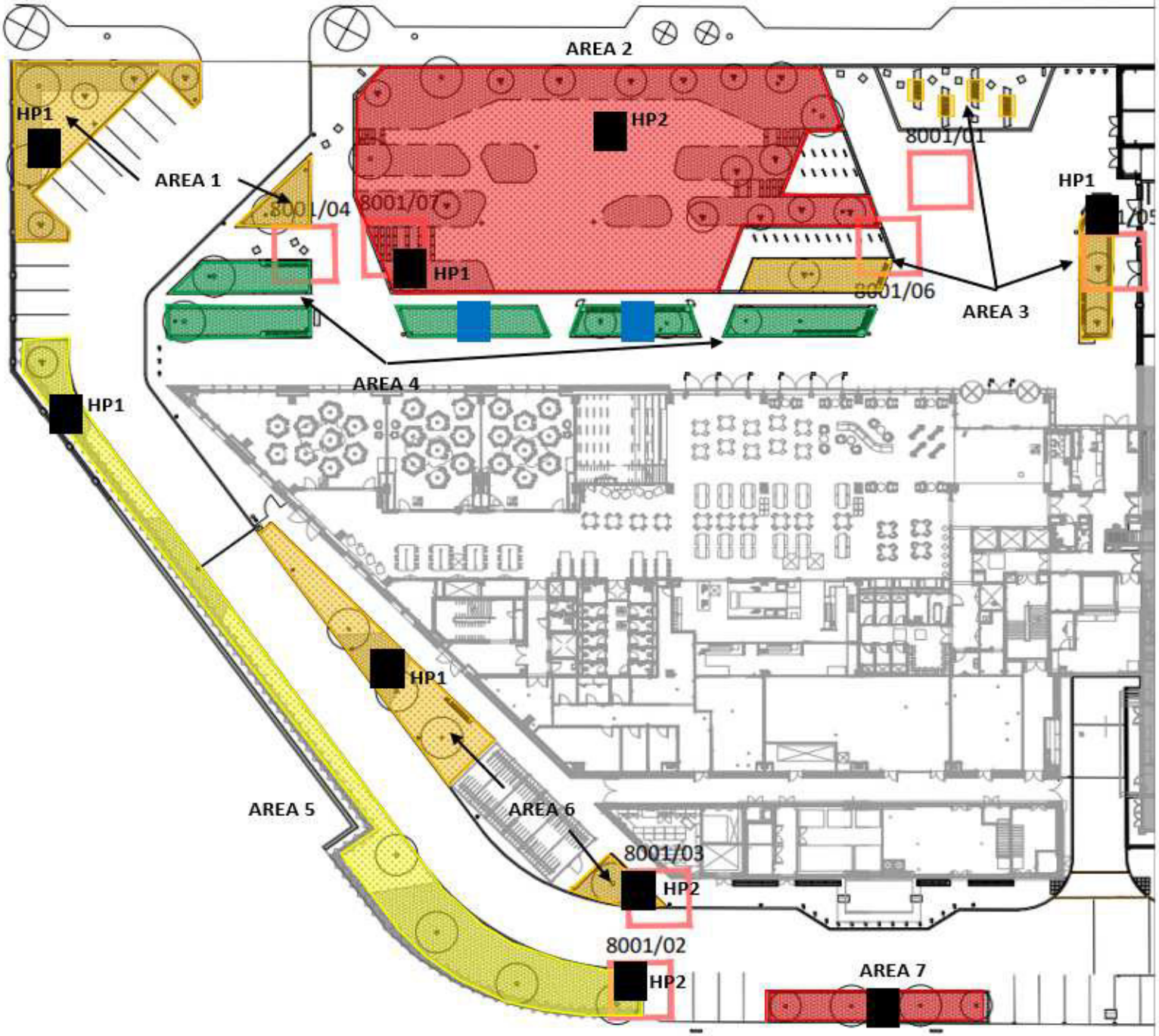
Status
APPROVED AS STAGE COMPLETE

A4

Drawing number
1338B-RFM-NB-00-DR-L-8001

Revision
C01

© re-form landscape architecture



CURTINS HAND PIT
(COMPLETED AUG 2023)

CURTINS HAND PIT
(COMPLETED MAY 2024)

Description:	Date:	By:	Chkd:

Curtins

Curtins Consulting Ltd,
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
t: 0161 236 2394
e: manchester@curtins.com
www.curtins.com

- Civils - Environmental - Infrastructure - Transport Planning - Sustainability - Expert Advisory Services
- Bristol - Cardiff - Douglas - Edinburgh - Kendal - Leeds - Liverpool - London - Manchester - Nottingham

INFORMATION

MMU Science & Engineering

Soft Landscaping Hand Pit Location Plan

	Size:	First Issue:	Drawn:	Checked:
	A3	29/05/24	LW	NF

069656-CUR-XX-XX-DR-GE-006

Rev: P02

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P01

1338B-NGB-XX-XX-DR-E-900002

Please update to most recent layout. The layout shown here for reference has been superseded.

Can all access covers be infill covers, filled with adjacent landscape finish?

Please can all chambers/access covers be located in areas of hard landscape with infill covers?

Please included irrigation for hedge planting

What is the depth of this existing mains water pipe? Is it still proposed to be in use?

As previously raised: Opening has been cast on site. There seem to be clashes of the M&E with both the arch and SE openings. Please survey opening and rearrange to suit.

Lamp post seems to be sitting above bunker lid. Bunker lid is removable. If possible, please relocate, alternatively lamp will need to be removed prior to access.

NEW 160ø FIRE SERVICES WATER MAIN CONNECTION TO UTILITY SUPPLY WITHIN CHESTER STREET

NEW 63ø POTABLE WATER MAIN CONNECTION TO UTILITY SUPPLY WITHIN CHESTER STREET

ISOLATION VALVES

UTILITY PROVIDERS WATER METERS

BOREHOLE WATER RETURN BOREHOLE. PROPOSED LOCATION AS STAGE 4 INFORMATION. BOREHOLE WATER SPECIALIST TO PROVIDE LOCATION AND SPECIFIC DETAILS OF THE BOREHOLES

GAS SERVICE POSITION TAKEN FROM STAGE 4 INFORMATION. POSITION TO BE VERIFIED ON SITE

BOREHOLE WATER EXTRACTION BOREHOLE. PROPOSED LOCATION AS STAGE 4 INFORMATION. BOREHOLE WATER SPECIALIST TO PROVIDE LOCATION AND SPECIFIC DETAILS OF THE BOREHOLES

6No 150ø DUCTS NON-ESS LV INTO SWITCH ROOM

6No 150ø DUCTS ESS LV INTO SWITCH ROOM

EXISTING INCOMING WATER SERVICE TO REMAIN AS INSTALLED

ENW NEW INCOMING 6kV SUPPLY CABLING

6No 150ø DUCTS NON-ESS LV INTO SWITCH ROOM

REFER TO DRAWING 1338B-NGB-NB-00-DR-E-908002 FOR DETAILS OF THE DUCTING SYSTEMS UNDER THE SLAB WITHIN THE ENERGY CENTRE

12No 150ø DUCTS NON-ESS LV SUPPLY LAID IN 2 LAYERS OF 6

6No 150ø DUCTS ESS LV SUPPLY LAID IN 2 LAYERS OF 3

CHAMBERS FOR CABLING TO EXTERNAL ACCESS CONTROL POST POSITIONS

REFER TO DRAWING 1338B-NGB-NB-00-DR-E-908001 FOR DETAILS OF THE DUCTING SYSTEMS UNDER THE SLAB WITHIN THE BUILDING

POTABLE WATER SERVICE AND BOREHOLE WATER SERVICE PIPEWORK ENTERS THE BUILDING

REFER TO DRAWING 1338B-NGB-NB-00-DR-E-908001 FOR DETAILS OF THE LAB GAS SERVICE TRENCH

EXISTING EXTERNAL FEEDER PILLAR TO SERVE EV CHARGING POSTS

EV CHARGING POSTS

2No 150ø LV

1No 150ø LV FEED TO CYCLE SHELTER

2No 150ø LV

4No 150ø LV

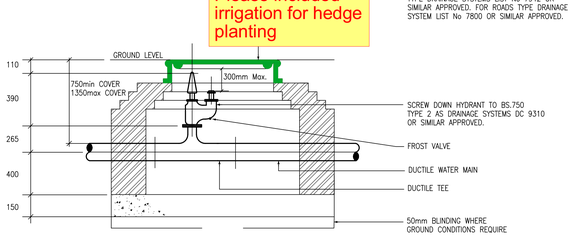
1No 150ø COMMS

2No 150ø COMMS

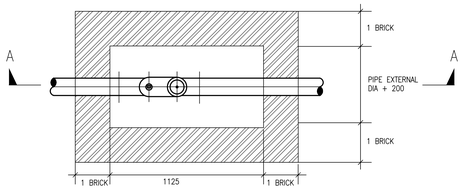
ISOLATION VALVES

25ø WATER SERVICE

C.I. HYDRANT BOX TO B.S. 750 (HINGED) 230x380mm CLEAR OPENING FOR FOOTPATHS: TYPE DRAINAGE SYSTEMS LIST No 7942 OR SIMILAR APPROVED. FOR ROADS TYPE DRAINAGE SYSTEM LIST No 7800 OR SIMILAR APPROVED.



SECTION A–A

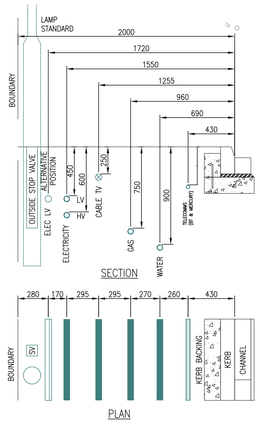


Plan
(SCREW DOWN TYPE)

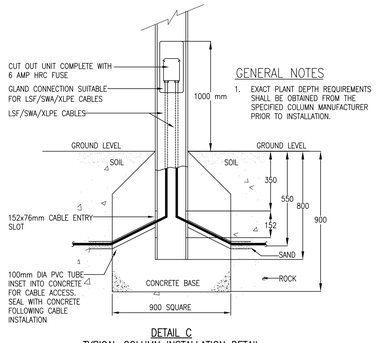
FIRE HYDRANT DETAIL

NJUG GUIDELINES FOR BURRIED SERVICES

ASSETT OWNER	DUCT	PIPE	CABLE	MARKER SYSTEM	RECOMMENDED MINIMUM DEPTHS (mm)	
					FOOTWAY	CARRIAGEWAY
ELECTRICITY HV (HIGH VOLTAGE)	BLACK OR RED DUCT OF TILE	N/A	BLACK OR RED	YELLOW WITH BLACK AND RED LEGEND OR CONCRETE TILES	450–1200	750–1200
ELECTRICITY LV (LOW VOLTAGE)					450	600
GAS	YELLOW	*** SEE ROW BELOW	N/A	BLACK LEGEND ON PE PIPES EVERY LINEAR METRE	600 (FOOTWAY) 750 (VERGE)	750
	***PE – UP TO 2 BAR–YELLOW OR YELLOW WITH BROWN STRIPES (REMOVABLE SKIN REVEALING WHITE OR BLACK CORE PIPE) – BETWEEN 2 TO 3 BAR–ORANGE. STEEL PIPES MAY HAVE YELLOW WRAP OR BLACK TAR COATING OR NO COATING. DUCTILE IRON MAY HAVE PLASTIC WRAPPING. ASSBESTOS & PIT/SPUN CAST IRON–NC DISTINGUISHABLE COLOUR.					
TELECOMMS	GREY, WHITE, GREEN, BLACK, PURPLE	N/A	BLACK OR LIGHT GREY	VARIOUS	250–350	450–600
WATER	BLUE OR GREY	BLUE POLYMER OR BLUE OR UNCOATED IRON /GRP, BLUE POLYMER WITH BROWN STRIPE (REMOVABLE SKIN REVEALING WHITE OR BLACK PIPE)	N/A	BLUE OR BLUE/BLACK	750	750 MIN



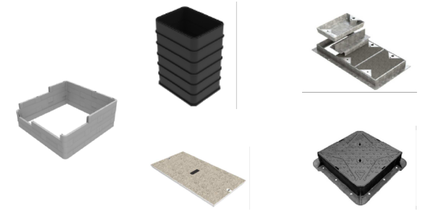
DETAIL B
RECOMMENDED ARRANGEMENT OF UTILITY MAINS IN 2 METRE FOOTWAY
NTS



GENERAL NOTES

1. EXACT PLANT DEPTH REQUIREMENTS SHALL BE OBTAINED FROM THE SPECIFIED COLUMN MANUFACTURER PRIOR TO INSTALLATION.

DETAIL C
TYPICAL COLUMN INSTALLATION DETAIL
NTS



TYPICAL MODULAR INSPECTION/TURN CHAMBER IMAGES. FINAL TYPE AND COVER DETAIL TO BE AGREED WITH THE LANDSCAPE ARCHITECT

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

For details of site wide and general risks to be read in conjunction with these notes, refer to the following documents:

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following;

Construction and Manufacture
FOR DETAILS OF ANY HAZOPS, REFER TO M52 SERIES DRAWING.

Maintenance, Cleaning and Operation
FOR DETAILS OF ANY HAZOPS, REFER TO M52 SERIES DRAWING.

Decommissioning and Demolition
FOR DETAILS OF ANY HAZOPS, REFER TO M52 SERIES DRAWING.

It is assumed that all works associated with this drawing will be carried out by competent operatives working, where appropriate, to an approved method statement.

LEGEND

- LOW VOLTAGE SERVICES DUCTING
- HIGH VOLTAGE SERVICES DUCTING
- COMMS/BMS/SECURITY SERVICES DUCTING
- MAINS WATER SERVICE PIPEWORK
- EXISTING MAINS WATER SERVICE PIPEWORK
- BOREHOLE WATER SERVICE PIPE WORK (TBC BY SPECIALIST
- NON-ESSENTIAL LV SERVICES DUCTING
- ESSENTIAL LV SERVICES DUCTING
- 1200X1200 INSPECTION/TURN CHAMBER FOR NON-ESSENTIAL LV SERVICES
- 1500X1500 INSPECTION/TURN CHAMBER FOR NON-ESSENTIAL LV SERVICES
- 1000X1000 INSPECTION/TURN CHAMBER FOR ESSENTIAL LV SERVICES
- 600X600 INSPECTION/TURN CHAMBER FOR EXTERNAL LV SERVICES
- 600X600 INSPECTION/TURN CHAMBER FOR EXTERNAL COMMS/BMS/SECURITY SERVICES
- EXTERNAL FEEDER PILLAR
- EXTERNAL FEEDER PILLAR
- EXTERNAL LUMINAIRE POSITION, REFER TO DRAWING 1338B-NGB-XX-XX-E-9001 FOR LUMINAIRE DETAILS
- ISOLATION VALVES
- WATER METER
- ELECTRIC VEHICLE CHARGING POST
- FIRE HYDRANT

NOTES

1.0 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL PROJECT DRAWINGS, DOCUMENTS AND SPECIFICATIONS

2.0 EXTERNAL SERVICES DUCTS ARE TO BE LAID IN ACCORDANCE WITH NJUG GUIDELINES.

3.0 THE EXISTING SITE SERVICES POSITIONS ARE TAKEN FROM THE WORKS STAGE 4 INFORMATION. ALL POSITIONS ARE TO BE VERIFIED ON SITE PRIOR TO DIGGING

4.0 THE LV CABLE DUCTING BETWEEN THE ENERGY CENTRE AND THE MAIN BUILDING IS TO MAINTAIN SEPARATION OF THE NON-ESSENTIAL AND THE ESSENTIAL/LIFE SAFETY SERVICES.

5.0 REFER TO DRAWING 1338B-NGB-NB-XX-E-908001 FOR DETAILS OF SERVICES DUCTING BELOW THE MAIN BUILDING SLAB.

6.0 REFER TO DRAWING 1338B-NGB-NB-XX-E-908002 FOR DETAILS OF SERVICES DUCTING WITHIN THE ENERGY CENTRE.

7.0 DRAINAGE SERVICES TAKEN FROM CURTINS DRAWING 1338B-CUR-ZZ-00-DR-C-520000 REV C04.

8.0 BOREHOLE INSTALLATION BOREHOLES, PIPEWORK AND DETAILS ARE TO BE CONFIRMED BY THE BOREHOLE SPECIALIST CONTRACTOR.

9.0 FINAL POSITIONING OF THE ACCESS/TURN CHAMBERS AND THE COVER TYPES ARE TO BE AGREED/COORDINATED WITH THE LANDSCAPE ARCHITECT.

10.0 ROOT BARRIERS TO BE PROVIDED FOR SERVICES RUNNING CLOSE TO TREE ROOT AREAS.

11.0 FIRE HYDRANT/SPRINKLER SUPPLY SHOWN AS A RADIAL CIRCUIT FROM THE SITE BOUNDARY/UTILITY SUPPLY. ARRANGEMENT TO BE VERIFIED WITH HOARE LEA AND THE WATER UTILITY PROVIDER AS TO THE SYSTEM COMPLIANCE WITH BS9990.

Rev	Description	Date
P02	COMMENTS INCORPORATED	30.09.22
P01	PRELIMINARY ISSUE	22.11.21

NG Bailey
321 Ordsall Lane, Salford M5 3HP
Tel: 0161 872 0171

Client: Manchester Metropolitan University

Contract: MMU Science & Engineering, 99 Oxford RD, Manchester, M1 7EL

Design Manager: PL

Checked By: P Starkie

Drawn By: A Douglas

Title: External Services

Issue Date: 05/09/22

Status: S3 - For Review & Comment

Scale: 1:200

Sheet Size: A0

Rev: P02

Drawing No: 1338B-NGB-XX-XX-DR-E-900002

Preliminary
B - Minor Comments
eNG
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Appendix B – Photographic Records

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Photographic Record

Client Name: B&K **Project Name:** MMU Sci & Eng **Project No:** 069656

Photos Ref. Photograph provided by Bowmer & Kirkland.
Frame 1: Barrier pipe installation. **Date:** 04/07/2023



Frame 1

Client Name: B&K **Project Name:** MMU Sci & Eng **Project No:** 069656

Photos Ref. Photographs provided by Bowmer & Kirkland.
Frame 1: Location of a planter prior to subsoil deposition.
Frame 2: Planter with a geotextile membrane underlying subsoil/topsoil.
Frame 3: Topsoil samples being taken.
Frame 4: Depth of soil >600mm with geotextile membrane at the base.

Date: 27/07/2023



Frame 1



Frame 2



Frame 3



Frame 4

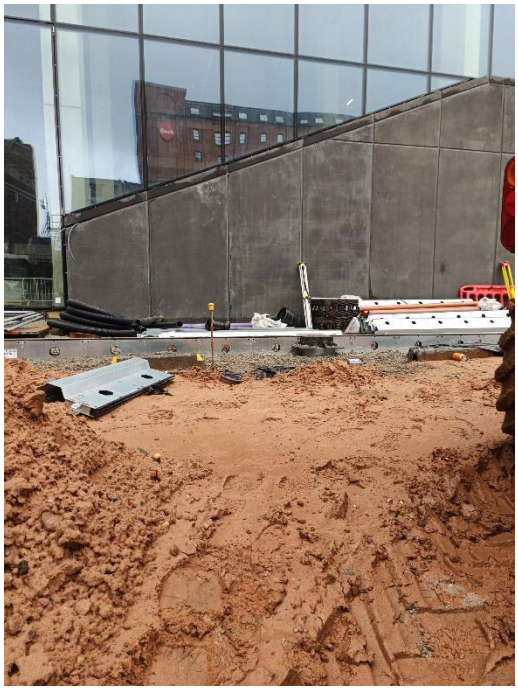
Client Name: B&K **Project Name:** MMU Sci & Eng **Project No:** 069656

Photos Ref. Photographs provided by Bowmer & Kirkland.
Frame 1: Depth of topsoil/subsoil >600mm.
Frame 2: Subsoil in place.
Frame 3: Subsoil in place.

Date: 27/07/2023



Frame 1



Frame 2



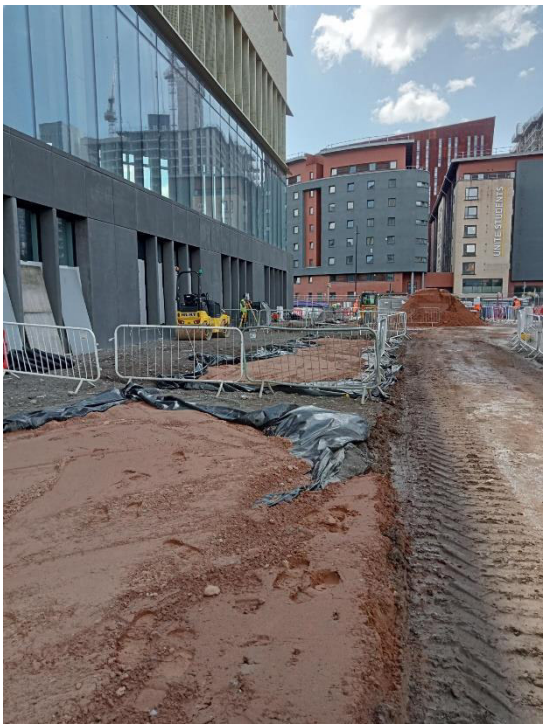
Frame 3

Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Photographs taken on site by a Curtins Engineer showing installed subsoil and subsoil stockpiles on site. **Date:** 19/07/2023



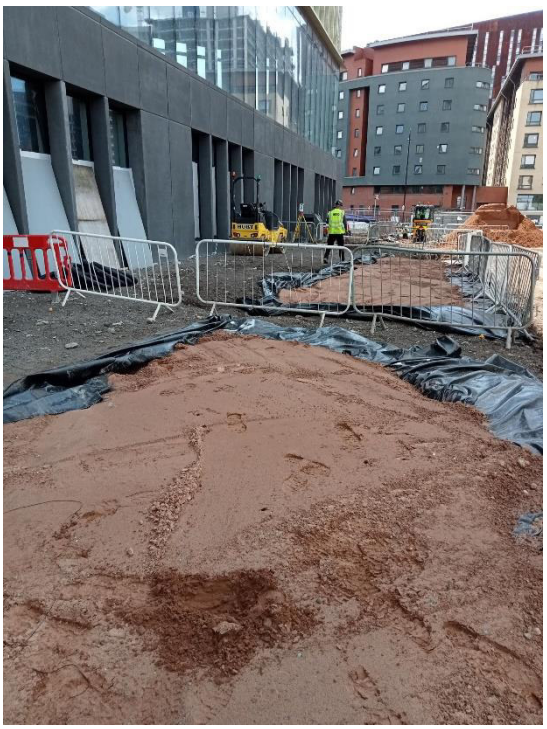






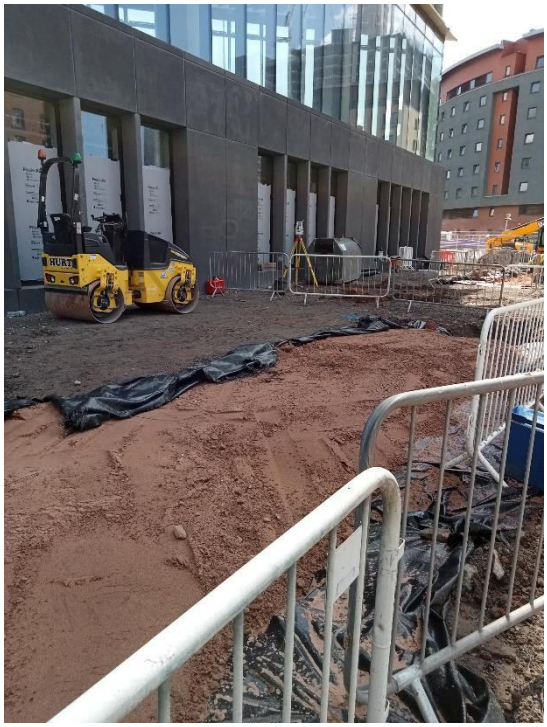
Client Name: B&K | **Project Name:** MMU Science & Eng | **Project No:** 069656

Photos Ref. Photographs taken on site by a Curtins Engineer showing installed subsoil and subsoil stockpiles on site. | **Date:** 19/07/2023







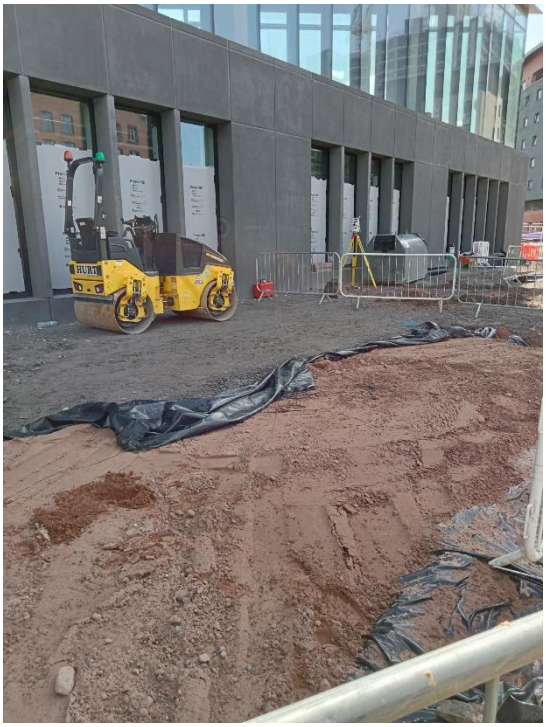


Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Photographs taken on site by a Curtins Engineer showing installed subsoil and subsoil stockpiles on site. **Date:** 19/07/2023







Client Name: B&K | **Project Name:** MMU Science & Eng | **Project No:** 069656

Photos Ref. Photographs taken on site by a Curtins Engineer showing installed subsoil stockpiles on site. | **Date:** 19/07/2023







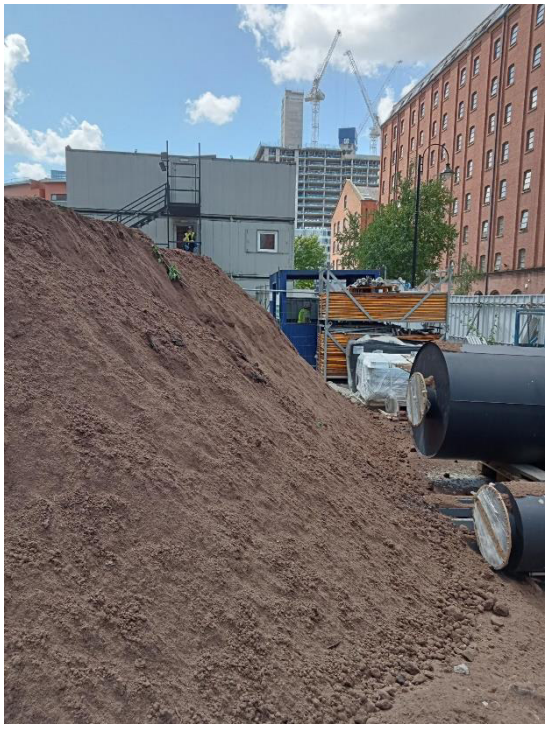
Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Photographs taken on site by a Curtins Engineer showing topsoil stockpiles on site. **Date:** 19/07/2023





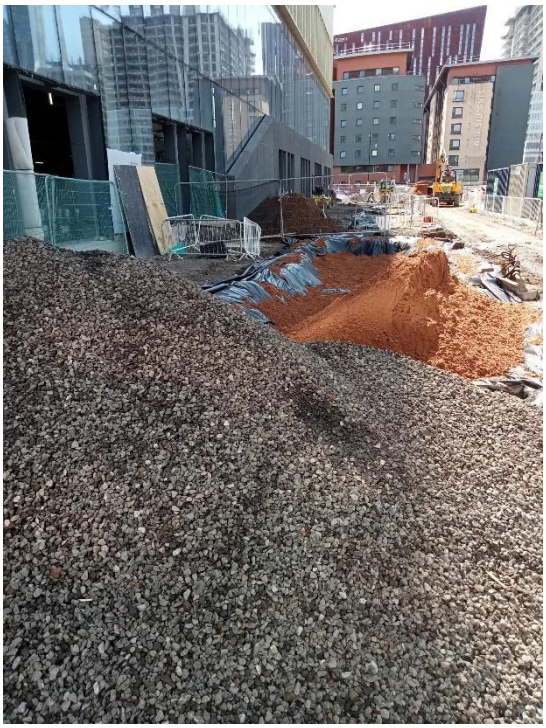




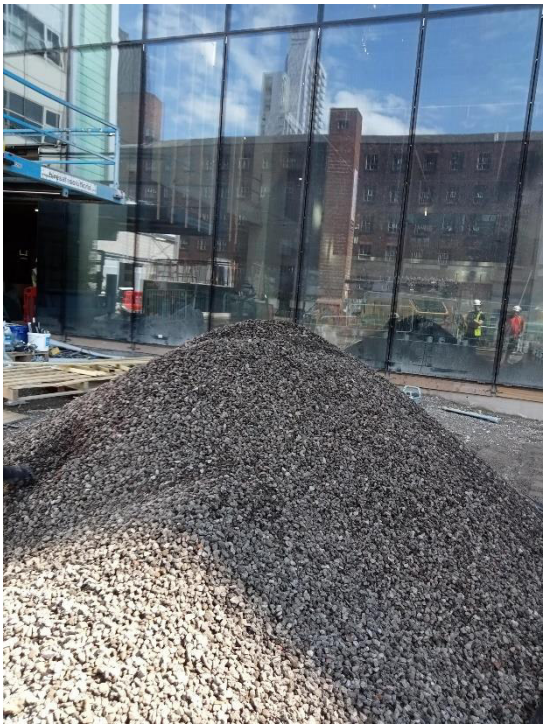
Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Pea gravel stockpiles for use on site beneath the subsoil, overlying the geotextile membrane. **Date:** 19/07/2023







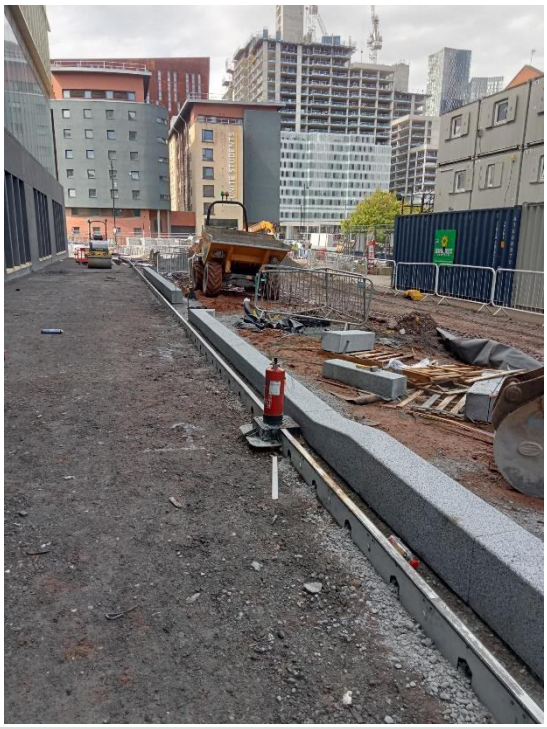


Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Kerb stones installed in areas of proposed soft landscaping. **Date:** 03/08/2023









Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 1 HP01 **Date: 17/05/2024**







Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 2 HP01 **Date: 17/05/2024**







Client Name: B&K | Project Name: MMU Science & Eng | Project No: 069656

Photos Ref. Engineered Capping Validation Area 2 HP02 **Date: 17/05/2024**









Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 3 Cable Pit 1 **Date: 17/05/2024**







Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 5 HP01 **Date: 17/05/2024**









Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 5 HP02 **Date: 17/05/2024**









Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 6 HP01 **Date: 17/05/2024**







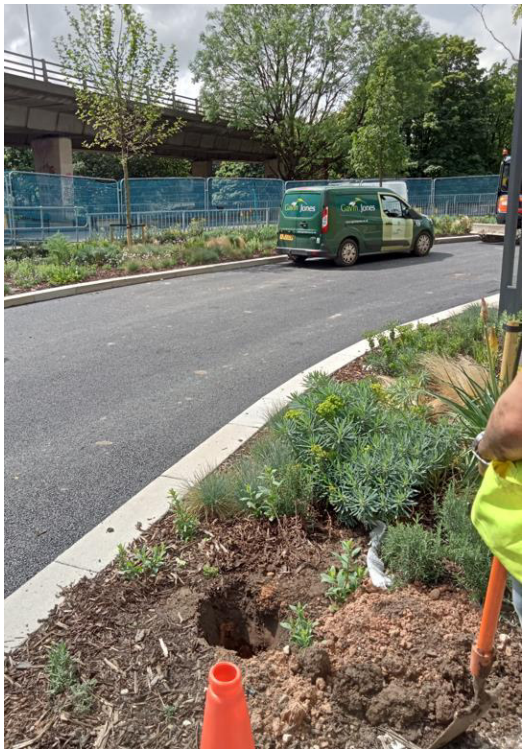


Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Validation Area 6 HP02 **Date: 17/05/2024**







Client Name: B&K | Project Name: MMU Science & Eng | Project No: 069656

Photos Ref. Engineered Capping Validation Area 7 HP01 **Date: 17/05/2024**





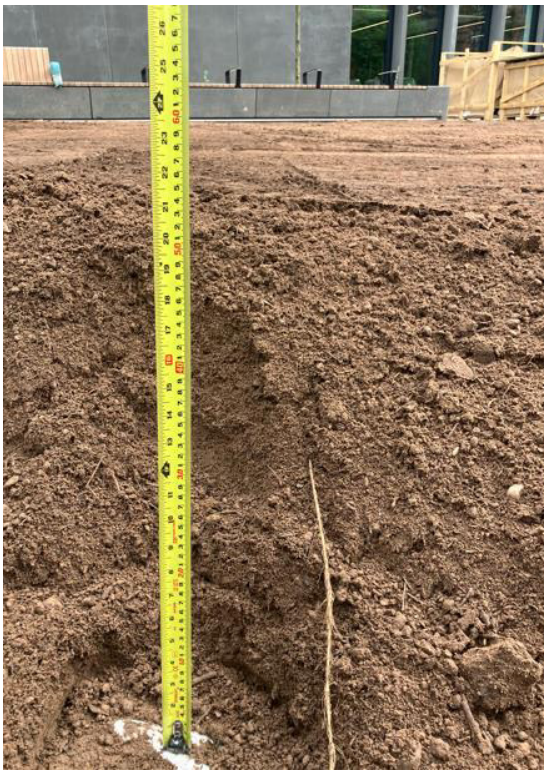


Client Name: B&K **Project Name:** MMU Science & Eng **Project No:** 069656

Photos Ref. Engineered Capping Construction Area 2, photos provided by B&K **Date: 16/05/2024 & 24/05/2024**







Appendix C – Soils Analysis

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TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Tarmac Topscape

Nathan Birchenall
Tarmac Topscape
Manchester Road
Congleton
Cheshire, CW12 2LU

28th March 2023
Our Ref: TOHA/23/7880/2/SS
Your Ref: PO 2002573841

Dear Sirs

Subsoil Analysis Report: Crown Farm

We have completed the analysis of the soil sample recently submitted, referenced *Crown Farm Subsoil* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil *(BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil).*

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the subsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the subsoil has left the Tarmac Topscape site.

SAMPLE EXAMINATION

The sample was described as a strong brown (Munsell Colour 7.5YR 5/6), slightly moist, friable, non-calcareous SAND with a single grained structure. The sample was slightly stony, and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

Registered in England No. OC324049 Registered Office: The Innovation Centre, Howbery Park, Wallingford, Oxfordshire OX10 8BA

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (% 5 sands, silt, clay);
- stone content (2-20mm, 20-75mm, >75mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- organic matter content;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *sand* texture class, with a total sand content which fell outside of the recommended textural ranges given in *BS8601:2013 - Figure 1*.

Further detailed particle size analysis revealed the sample to have a relatively narrow particle size distribution, with a large proportion of sand falling into the *medium sand* (0.25-0.50mm) class. In this instance, the high proportion of medium sand should provide a good balance between water retention for plant uptake and drainage of surplus water and as such this soil texture would be considered suitable for subsoil in general landscape applications.

The sample was virtually stone-free and, as such, stones should not restrict the use of the soil for use as subsoil in general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.6). This pH value would be considered suitable as subsoil for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was low, which indicates that soluble salts were not present at levels that would be harmful to plants.

The electrical conductivity value by $CaSO_4$ extract (*BS8601* requirement) fell below the maximum specified value (2800 µS/cm) given in *BS8601:2013 – Table 1*.

Organic Matter Content

The organic matter content was low (<0.5%) and compliant with *BS8601:2013 – Table 1*.

Potential Contaminants

With reference to *BS8601:2013 – Section 4.2*: *Note 2*, there is a recommendation to confirm levels of potential contaminants in relation to the subsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with homegrown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels* (C4SLs) *for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Tarmac Topscape

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS8601:2013 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil *(BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil).*

From the soil examination and subsequent laboratory analysis, the sample was described as an alkaline, non-saline, non-calcareous sand with a single grain structure and a very low stone content. The organic matter content was low and consistent with subsoil. Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

To conclude, based on our findings, the soil represented by this sample would be considered suitable as subsoil for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The sample largely compliant with the requirements of the British Standard for Subsoil *(BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil),* with the exception of the high sand content. This non-compliance would be considered minor based on the narrow particle size distribution of the sand fraction and provided it is used in conjunction with an adequate depth of topsoil.

Soil Handling Recommendations

Reference should be made to Section 6.0 of *BS8601:2013* with regard to the handling and management of the subsoil:

"Soils generally lose strength and become less resistant to damage as they become wetter; therefore, it is essential that they are stripped, handled and trafficked only in the appropriate conditions of weather and soil moisture, and with suitable machinery. If sustained heavy rainfall (e.g. >10 mm in 24 h) occurs during soil stripping operations, work should be suspended and not restarted until the ground has had at least one dry day or until a suitable moisture content has been reached. A soil can be considered to have a suitable moisture content for stripping and handling if the whole thickness of the subsoil layer being stripped and/or handled is at a moisture content below the plastic limit as determined in accordance with BS 1377-2:1990 (incorporating Amendment No. 1).

Machinery should be selected and routed to minimize soil compaction."

Further guidance is provided in Clauses 6.1–6.5.

Tarmac Topscape

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully





Zoe Duffin
MBiol
Graduate Soil Scientist

Aaron Cross
BSc MSc
Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

Tarmac Topscape

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Tarmac Topscape**
Project	**Crown Farm**
Job:	**Subsoil Analysis - BS8601:2013**
Date:	**28/03/2023**
Job Ref No:	**TOHA/23/7880/2/SS**

Sample Reference			**Crown Farm Subsoil**
		Accreditation	
Clay (<0.002mm)	%	UKAS	4
Silt (0.002-0.063mm)	%	UKAS	1
Very Fine Sand (0.063-0.15mm)	%	UKAS	4
Fine Sand (0.15-0.25mm)	%	UKAS	13
Medium Sand (0.25-0.50mm)	%	UKAS	62
Coarse Sand (0.50-1.0mm)	%	UKAS	15
Very Coarse Sand (1.0-2.0mm)	%	UKAS	1
Total Sand (0.063-2.0mm)	%	UKAS	95
Texture Class (UK Classification)	--	UKAS	S
Stones (2-20mm)	% DW	GLP	1
Stones (20-75mm)	% DW	GLP	0
Stones (>75mm)	% DW	GLP	0

pH Value (1:2.5 water extract)	units	UKAS	7.6
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	105
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	2095
Organic Matter (LOI)	%	UKAS	<0.5
Exchangeable Sodium Percentage	%	UKAS	0.9

Total Arsenic (As)	mg/kg	MCERTS	2
Total Cadmium (Cd)	mg/kg	MCERTS	< 0.2
Total Chromium (Cr)	mg/kg	MCERTS	4
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
Total Copper (Cu)	mg/kg	MCERTS	3
Total Lead (Pb)	mg/kg	MCERTS	2
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	4
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	6
Water Soluble Boron (B)	mg/kg	MCERTS	< 0.2
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0

Naphthalene	mg/kg	MCERTS	< 0.05
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	< 0.05
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	< 0.05
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	< 0.05
Pyrene	mg/kg	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	MCERTS	< 0.05
Chrysene	mg/kg	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	< 0.05
Total PAHs (sum USEPA16)	mg/kg	MCERTS	< 0.80

Aliphatic TPH >C5 - C6	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aliphatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aliphatic TPH >C16 - C21	mg/kg	MCERTS	< 8.0
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	< 8.0
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Aromatic TPH >C5 - C7	mg/kg	MCERTS	< 0.001
Aromatic TPH >C7 - C8	mg/kg	MCERTS	< 0.001
Aromatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aromatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aromatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aromatic TPH >C16 - C21	mg/kg	MCERTS	< 10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	< 10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	< 10

Benzene	mg/kg	MCERTS	< 0.005
Toluene	mg/kg	MCERTS	< 0.005
Ethylbenzene	mg/kg	MCERTS	< 0.005
p & m-oxylene	mg/kg	MCERTS	< 0.005
o-xylene	mg/kg	MCERTS	< 0.005
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.005

Asbestos	--	ISO 17025	Not Detected

S = SAND

Visual Examination

The sample was described as a strong brown (Munsell Colour 7.5YR 5/6), slightly moist, friable, non-calcareous SAND with a single grain structure. The sample was slightly stony and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Zoe Duffin
MBiol
Graduate Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with

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Tarmac Topscape

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Nathan Birchenall
Tarmac Topscape
Manchester Road
Congleton
Cheshire, CW12 2LU

28th March 2023
Our Ref: TOHA/23/7880/1/SS
Your Ref: PO 2002573841

Tarmac Topscape

Dear Sirs

Topsoil Analysis Report: Crown Farm

We have completed the analysis of the soil sample recently submitted, referenced *Crown Farm Topsoil* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil - Table 1, Multipurpose Topsoil).*

This report presents the results of analysis for the sample recently submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the Tarmac Topscape site.

SAMPLE EXAMINATION

The sample was described as a dark yellowish brown (Munsell Colour 10YR 3/4), slightly moist, friable, non-calcareous LOAMY SAND with a weakly developed, very fine to medium granular structure*. The sample was slightly stony and contained a high proportion of organic fines and frequent woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (% 5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class and would be described as light in texture. Further detailed particle size analysis found the sample to have a sufficiently narrow particle size distribution and a predominance of *medium sand* (0.25-0.50mm). This is usually ideal for topsoil in general landscape applications as reasonable porosity levels are generally maintained in a consolidated state and the risk of particle interpacking is reduced. The sample should therefore provide adequate drainage and aeration properties for general landscape applications.

The stone content of the sample was low and, as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.0). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by $CaSO_4$ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with home-grown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels* (C4SLs) *for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Tarmac Topscape

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil - Table 1, Multipurpose Topsoil).*

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, non-calcareous loamy sand with a weakly developed structure and low stone content. The sample contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The sample was also fully compliant with the requirements of the British Standard for Topsoil *(BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil).*

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, respreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further details on soil handling are provided in Annex A of *BS3882:2015.*

_____

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully





Zoe Duffin
MBiol
Graduate Soil Scientist

Aaron Cross
BSc MSc
Soil Scientist

For & on behalf of Tim O'Hare Associates LLP

Tarmac Topscape

TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	**Tarmac Topscape**
Project:	**Crown Farm**
Job:	**Topsoil Analysis - BS3882:2015**
Date:	**28/03/2023**
Job Ref No:	**TOHA/23/7880/1/SS**

Sample Reference			**Crown Farm Topsoil**
		Accreditation	
Clay (<0.002mm)	%	UKAS	7
Silt (0.002-0.05mm)	%	UKAS	7
Very Fine Sand (0.05-0.15mm)	%	UKAS	12
Fine Sand (0.15-0.25mm)	%	UKAS	12
Medium Sand (0.25-0.50mm)	%	UKAS	49
Coarse Sand (0.50-1.0mm)	%	UKAS	12
Very Coarse Sand (1.0-2.0mm)	%	UKAS	1
Total Sand (0.05-2.0mm)	%	UKAS	86
Texture Class (UK Classification)	--	UKAS	LS
Stones (2-20mm)	% DW	GLP	3
Stones (20-50mm)	% DW	GLP	1
Stones (>50mm)	% DW	GLP	0
pH Value (1:2.5 water extract)	units	UKAS	8.0
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS	722
Electrical Conductivity (1:2 $CaSO_4$ extract)	uS/cm	UKAS	2803
Exchangeable Sodium Percentage	%	UKAS	5.4
Organic Matter (LOI)	%	UKAS	3.6
Total Nitrogen (Dumas)	%	UKAS	0.20
C : N Ratio	ratio	UKAS	10
Extractable Phosphorus	mg/l	UKAS	54
Extractable Potassium	mg/l	UKAS	648
Extractable Magnesium	mg/l	UKAS	135
Total Arsenic (As)	mg/kg	MCERTS	3
Total Cadmium (Cd)	mg/kg	MCERTS	< 0.2
Total Chromium (Cr)	mg/kg	MCERTS	7
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS	< 1.8
Total Copper (Cu)	mg/kg	MCERTS	8
Total Lead (Pb)	mg/kg	MCERTS	12
Total Mercury (Hg)	mg/kg	MCERTS	< 0.3
Total Nickel (Ni)	mg/kg	MCERTS	7
Total Selenium (Se)	mg/kg	MCERTS	< 1.0
Total Zinc (Zn)	mg/kg	MCERTS	26
Water Soluble Boron (B)	mg/kg	MCERTS	0.4
Total Cyanide (CN)	mg/kg	MCERTS	< 1.0
Total (mono) Phenols	mg/kg	MCERTS	< 1.0
Naphthalene	mg/kg	MCERTS	< 0.05
Acenaphthylene	mg/kg	MCERTS	< 0.05
Acenaphthene	mg/kg	MCERTS	< 0.05
Fluorene	mg/kg	MCERTS	< 0.05
Phenanthrene	mg/kg	MCERTS	< 0.05
Anthracene	mg/kg	MCERTS	< 0.05
Fluoranthene	mg/kg	MCERTS	< 0.05
Pyrene	mg/kg	MCERTS	0.06
Benzo(a)anthracene	mg/kg	MCERTS	< 0.05
Chrysene	mg/kg	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	MCERTS	< 0.05
Benzo(g,h,i)perylene	mg/kg	MCERTS	< 0.05
Total PAHs (sum USEPA16)	mg/kg	MCERTS	< 0.80
Aliphatic TPH >C5 - C6	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C6 - C8	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aliphatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aliphatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aliphatic TPH >C16 - C21	mg/kg	MCERTS	< 8.0
Aliphatic TPH >C21 - C35	mg/kg	MCERTS	< 8.0
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Aromatic TPH >C5 - C7	mg/kg	MCERTS	< 0.001
Aromatic TPH >C7 - C8	mg/kg	MCERTS	< 0.001
Aromatic TPH >C8 - C10	mg/kg	MCERTS	< 0.001
Aromatic TPH >C10 - C12	mg/kg	MCERTS	< 1.0
Aromatic TPH >C12 - C16	mg/kg	MCERTS	< 2.0
Aromatic TPH >C16 - C21	mg/kg	MCERTS	< 10
Aromatic TPH >C21 - C35	mg/kg	MCERTS	< 10
Aromatic TPH (C5 - C35)	mg/kg	MCERTS	< 10
Benzene	mg/kg	MCERTS	< 0.005
Toluene	mg/kg	MCERTS	< 0.005
Ethylbenzene	mg/kg	MCERTS	< 0.005
o-xylene	mg/kg	MCERTS	< 0.005
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS	< 0.005
Asbestos	ND/D	ISO 17025	Not Detected

LS = LOAMY SAND

Visual Examination

The sample was described as a dark yellowish brown (Munsell Colour 10YR 3/4), slightly moist, friable, non-calcareous LOAMY SAND with a weakly developed, very fine to medium granular structure. The sample was slightly stony and contained a high proportion of organic fines and frequent woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Zoe Duffin
MBiol
Graduate Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with

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Tarmac Topscape

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/07316
Issue Number: 1 **Date:** 02 August, 2023

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

Project Manager: Jonathan Provis/Niall Farnworth/Rebecca Steven
Project Name: MMU S&E
Project Ref: 69656
Order No: 8035
Date Samples Received: 20/07/23
Date Instructions Received: 21/07/23
Date Analysis Completed: 02/08/23

Approved by:



Gemma Berrisford
Client Manager

Envirolab Job Number: 23/07316

Client Project Name: MMU S&E

Client Project Ref: 69656

Lab Sample ID	23/07316/1	23/07316/2	23/07316/3	23/07316/4	23/07316/5	23/07316/6		Units	Limit of Detection	Method ref
Client Sample No	North	East	West			West				
Client Sample ID	TS01	TS02	TS03	SS01	SS02	SS03				
Depth to Top				0.00	0.00					
Depth To Bottom				0.10	0.10					
Date Sampled	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23				
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES				
Sample Matrix Code	1A	1A	1AE	1A	1A	1A				
% Stones >10mm$_A$	<0.1	<0.1	1.5	<0.1	5.0	0.7		% w/w	0.1	A-T-044
pH$_D$ M#	8.14	8.13	8.29	8.20	8.09	8.49		pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	0.07	0.03	0.10	<0.01	<0.01	<0.01		g/l	0.01	A-T-026s
Cyanide (total)$_A$ M#	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		mg/kg	0.2	A-T-050s
Organic Matter$_D$ M#	2.2	2.7	2.3	<0.1	<0.1	<0.1		% w/w	0.1	A-T-032s
Arsenic$_D$ M#	1	<1	<1	1	2	<1		mg/kg	1	A-T-024s
Boron (water soluble)$_D$ M#	<1.0	1.2	1.8	<1.0	<1.0	<1.0		mg/kg	1	A-T-027s
Cadmium$_D$ M#	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		mg/kg	0.5	A-T-024s
Copper$_D$ M#	14	8	24	5	5	6		mg/kg	1	A-T-024s
Chromium$_D$ M#	7	7	8	7	7	7		mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead$_D$ M#	15	12	19	2	2	2		mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17		mg/kg	0.17	A-T-024s
Nickel$_D$ M#	6	6	36	7	7	6		mg/kg	1	A-T-024s
Selenium$_D$ M#	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-024s
Zinc$_D$ M#	34	22	60	10	10	11		mg/kg	5	A-T-024s

Envirolab Job Number: 23/07316

Client Project Name: MMU S&E

Client Project Ref: 69656

Lab Sample ID	23/07316/1	23/07316/2	23/07316/3	23/07316/4	23/07316/5	23/07316/6		Units	Limit of Detection	Method ref
Client Sample No	North	East	West			West				
Client Sample ID	TS01	TS02	TS03	SS01	SS02	SS03				
Depth to Top				0.00	0.00					
Depth To Bottom				0.10	0.10					
Date Sampled	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23				
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES				
Sample Matrix Code	1A	1A	1AE	1A	1A	1A				
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD	NAD	NAD	NAD	NAD	NAD				A-T-045
Asbestos Matrix (visual)$_{D}$	-	-	-	-	-	-				A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-	-	-	-				A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	N/A	N/A	N/A	N/A	N/A				A-T-045

Envirolab Job Number: 23/07316

Client Project Name: MMU S&E

Client Project Ref: 69656

Lab Sample ID	23/07316/1	23/07316/2	23/07316/3	23/07316/4	23/07316/5	23/07316/6		Units	Limit of Detection	Method ref
Client Sample No	North	East	West			West				
Client Sample ID	TS01	TS02	TS03	SS01	SS02	SS03				
Depth to Top				0.00	0.00					
Depth To Bottom				0.10	0.10					
Date Sampled	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23				
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES				
Sample Matrix Code	1A	1A	1AE	1A	1A	1A				
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.23	<0.04	0.06	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.22	<0.04	0.06	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.24	0.07	0.08	<0.05	<0.05	<0.05		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.10	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.09	<0.07	<0.07	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.28	<0.06	0.08	<0.06	<0.06	<0.06		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A$	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.28	<0.08	0.12	<0.08	<0.08	<0.08		mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.12	<0.03	0.03	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.07	<0.03	0.05	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.28	<0.07	0.10	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Total PAH-16MS$_A$	1.91	<0.08	0.58	<0.08	<0.08	<0.08		mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/07316

Client Project Name: MMU S&E

Client Project Ref: 69656

Lab Sample ID	23/07316/1	23/07316/2	23/07316/3	23/07316/4	23/07316/5	23/07316/6		Units	Limit of Detection	Method ref
Client Sample No	North	East	West			West				
Client Sample ID	TS01	TS02	TS03	SS01	SS02	SS03				
Depth to Top				0.00	0.00					
Depth To Bottom				0.10	0.10					
Date Sampled	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23	19-Jul-23				
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES				
Sample Matrix Code	1A	1A	1AE	1A	1A	1A				
TPH CWG with Clean Up										
Ali >C5-C6$_A$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C6-C8$_A$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	1	1	2	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	20	22	30	<1	<1	<1		mg/kg	1	A-T-055s
Total Aliphatics$_A$	21	23	32	<1	<1	<1		mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	2	2	2	<1	<1	<1		mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1	<1	1	<1	<1	<1		mg/kg	1	A-T-055s
Aro >C12-C16$_A$	3	3	5	<1	<1	<1		mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	5	5	7	<1	<1	<1		mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	12	12	17	<1	<1	<1		mg/kg	1	A-T-055s
Total Aromatics$_A$	22	22	32	<1	<1	<1		mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	43	45	65	<1	<1	<1		mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<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 within the same delivery, will be disposed of **six weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

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

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.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25ºC / 11550µS/cm @ 20ºC fall outside the accreditation range and as such are unaccredited.

Please contact your client manager if you require 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: MMU S&E

Clients Project No: 69656

Project No: 23/07316

Date Received: 21/07/2023 (am)

Cool Box Temperatures (°C): 17.9

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

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

Envirolab Analysis Dates

Lab Sample ID	23/07316/1	23/07316/2	23/07316/3	23/07316/4	23/07316/5	23/07316/6
Client Sample No	North	East	West			West
Client Sample ID/Depth	TS01	TS02	TS03	SS01 0.00-0.10m	SS02 0.00-0.10m	SS03
Date Sampled	19/07/23	19/07/23	19/07/23	19/07/23	19/07/23	19/07/23
A-T-019s	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023
A-T-022s	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-024s	02/08/2023	02/08/2023	02/08/2023	02/08/2023	02/08/2023	02/08/2023
A-T-026s	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023
A-T-027s	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023
A-T-031s	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023
A-T-032s	02/08/2023	02/08/2023	02/08/2023	02/08/2023	02/08/2023	02/08/2023
A-T-040s	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023	01/08/2023
A-T-042sTCN	26/07/2023	26/07/2023	26/07/2023	26/07/2023	26/07/2023	26/07/2023
A-T-044	30/07/2023	30/07/2023	30/07/2023	30/07/2023	30/07/2023	30/07/2023
A-T-045	24/07/2023	24/07/2023	24/07/2023	24/07/2023	24/07/2023	24/07/2023
A-T-050s	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023
A-T-055s	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023
Calc-As Recd	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023

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

End of Report

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/04706
Issue Number: 1 **Date:** 20 May, 2024

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

Project Manager: Niall Farnworth
Project Name: MMU Scieence & Engineering
Project Ref: B069656
Order No: 14969
Date Samples Received: 13/05/24
Date Instructions Received: 13/05/24
Date Analysis Completed: 20/05/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/04706

Client Project Name: MMU Scieence & Engineering

Client Project Ref: B069656

Lab Sample ID	24/04706/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	TS101									
Depth to Top										
Depth To Bottom										
Date Sampled	09-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
% Moisture at <40C$_A$	14.1							% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1							% w/w	0.1	A-T-044
pH$_D^{M\#}$	8.22							pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D^{M\#}$	0.06							g/l	0.01	A-T-026s
Cyanide (total)$_A^{M\#}$	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.4							mg/kg	0.2	A-T-050s
Organic Matter$_D^{M\#}$	7.1							% w/w	0.1	A-T-032s
Arsenic$_D^{M\#}$	1							mg/kg	1	A-T-024s
Boron (water soluble)$_D^{M\#}$	<1.0							mg/kg	1	A-T-027s
Cadmium$_D^{M\#}$	<0.5							mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	11							mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	9							mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1							mg/kg	1	A-T-040s
Lead$_D^{M\#}$	13							mg/kg	1	A-T-024s
Mercury$_D$	<0.17							mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	8							mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1							mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	32							mg/kg	5	A-T-024s

Envirolab Job Number: 24/04706

Client Project Name: MMU Scieence & Engineering

Client Project Ref: B069656

Lab Sample ID	24/04706/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	TS101									
Depth to Top										
Depth To Bottom										
Date Sampled	09-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD									A-T-045
Asbestos Matrix (visual)$_{D}$	-									A-T-045
Asbestos Matrix (microscope)$_{D}$	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A									A-T-045

Envirolab Job Number: 24/04706

Client Project Name: MMU Scieence & Engineering

Client Project Ref: B069656

Lab Sample ID	24/04706/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	TS101									
Depth to Top										
Depth To Bottom										
Date Sampled	09-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02							mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.09							mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.07							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.13							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07							mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.10							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A$	<0.04							mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.23							mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.06							mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03							mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.10							mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.20							mg/kg	0.07	A-T-019s
Total PAH-16MS$_A$	0.98							mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/04706

Client Project Name: MMU Scieence & Engineering

Client Project Ref: B069656

Lab Sample ID	24/04706/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	TS101									
Depth to Top										
Depth To Bottom										
Date Sampled	09-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
TPH CWG with Clean Up										
Ali >C5-C6$_A$	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8$_A$	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	1							mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	28							mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	83							mg/kg	1	A-T-055s
Total Aliphatics$_A$	112							mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1							mg/kg	1	A-T-055s
Aro >C12-C16$_A$	2							mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	22							mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	27							mg/kg	1	A-T-055s
Total Aromatics$_A$	51							mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	163							mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s

Report Notes

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

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

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.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25ºC / 11550µS/cm @ 20ºC fall outside the accreditation range and as such are unaccredited.

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

Envirolab Deviating Samples Report

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

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

Project: MMU Scieence & Engineering

Clients Project No: B069656

Project No: 24/04706

Date Received: 13/05/2024 (am)

Cool Box Temperatures (°C): 18.8

NO DEVIATIONS IDENTIFIED

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

Envirolab Analysis Dates

Lab Sample ID	24/04706/1
Client Sample No	ES1
Client Sample ID/Depth	TS101
Date Sampled	09/05/24
A-T-019s	20/05/2024
A-T-022s	17/05/2024
A-T-024s	20/05/2024
A-T-026s	17/05/2024
A-T-027s	17/05/2024
A-T-031s	20/05/2024
A-T-032s	17/05/2024
A-T-040s	17/05/2024
A-T-042sTCN	16/05/2024
A-T-044	16/05/2024
A-T-045	14/05/2024
A-T-050s	17/05/2024
A-T-055s	16/05/2024
Calc-As Recd	17/05/2024

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

End of Report

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

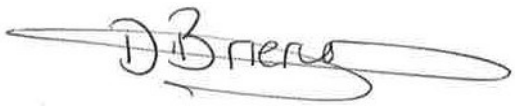
INTERIM ANALYTICAL TEST REPORT

Envirolab Job Number: 24/05003
Issue Number: 1 **Date:** 30 May, 2024

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

Project Manager: Lucy Woods/Niall Farnworth
Project Name: MMU Science & Engineering
Project Ref: B069656
Order No: 15164
Date Samples Received: 20/05/24
Date Instructions Received: 21/05/24
Date Analysis Completed: 28/05/24

Approved by:



Danielle Brierley
Client Services Supervisor

Envirolab Job Number: 24/05003

Client Project Name: MMU Science & Engineering

Client Project Ref: B069656

Lab Sample ID	24/05003/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS101									
Depth to Top	0.35									
Depth To Bottom										
Date Sampled	17-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
% Moisture at <40C$_A$	16.2							% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1							% w/w	0.1	A-T-044
pH$_D$$^{M\#}$	8.18							pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_D$$^{M\#}$	0.04							g/l	0.01	A-T-026s
Phenols - Total by HPLC$_A$	<0.2							mg/kg	0.2	A-T-050s
Organic Matter$_D$$^{M\#}$	0.7							% w/w	0.1	A-T-032s
Arsenic$_D$$^{M\#}$	1							mg/kg	1	A-T-024s
Boron (water soluble)$_D$$^{M\#}$	<1.0							mg/kg	1	A-T-027s
Cadmium$_D$$^{M\#}$	<0.5							mg/kg	0.5	A-T-024s
Copper$_D$$^{M\#}$	9							mg/kg	1	A-T-024s
Chromium$_D$$^{M\#}$	9							mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1							mg/kg	1	A-T-040s
Lead$_D$$^{M\#}$	7							mg/kg	1	A-T-024s
Mercury$_D$	<0.17							mg/kg	0.17	A-T-024s
Nickel$_D$$^{M\#}$	9							mg/kg	1	A-T-024s
Selenium$_D$$^{M\#}$	<1							mg/kg	1	A-T-024s
Zinc$_D$$^{M\#}$	24							mg/kg	5	A-T-024s

Envirolab Job Number: 24/05003

Client Project Name: MMU Science & Engineering

Client Project Ref: B069656

Lab Sample ID	24/05003/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS101									
Depth to Top	0.35									
Depth To Bottom										
Date Sampled	17-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD									A-T-045
Asbestos Matrix (visual)$_{D}$	-									A-T-045
Asbestos Matrix (microscope)$_{D}$	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A									A-T-045

Envirolab Job Number: 24/05003

Client Project Name: MMU Science & Engineering

Client Project Ref: B069656

Lab Sample ID	24/05003/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS101									
Depth to Top	0.35									
Depth To Bottom										
Date Sampled	17-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02							mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04							mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07							mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A$	<0.04							mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08							mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03							mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03							mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03							mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	<0.07							mg/kg	0.07	A-T-019s
Total PAH-16MS$_A$	<0.08							mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/05003

Client Project Name: MMU Science & Engineering

Client Project Ref: B069656

Lab Sample ID	24/05003/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS101									
Depth to Top	0.35									
Depth To Bottom										
Date Sampled	17-May-24									
Sample Type	SOIL - ES									
Sample Matrix Code	4AE									
TPH CWG with Clean Up										
Ali >C5-C6$_A$	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8$_A$	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Total Aliphatics$_A$	<1							mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1							mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1							mg/kg	1	A-T-055s
Aro >C12-C16$_A$	<1							mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	<1							mg/kg	1	A-T-055s
Total Aromatics$_A$	<1							mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	<1							mg/kg	1	Calc-As Recd
BTEX - Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01							mg/kg	0.01	A-T-022s

Report Notes

General
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The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

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

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.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25ºC / 11550µS/cm @ 20ºC fall outside the accreditation range and as such are unaccredited.

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

Envirolab Deviating Samples Report

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

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

Project: MMU Science & Engineering

Clients Project No: B069656

Project No: 24/05003

Date Received: 21/05/2024 (am)

Cool Box Temperatures (°C): 17.0

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

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

Envirolab Analysis Dates

Lab Sample ID	24/05003/1
Client Sample No	
Client Sample ID/Depth	SS101 0.35m
Date Sampled	17/05/24
A-T-019s	28/05/2024
A-T-022s	28/05/2024
A-T-024s	28/05/2024
A-T-026s	28/05/2024
A-T-027s	24/05/2024
A-T-031s	24/05/2024
A-T-032s	24/05/2024
A-T-040s	28/05/2024
A-T-042sTCN	
A-T-044	28/05/2024
A-T-045	23/05/2024
A-T-050s	28/05/2024
A-T-055s	24/05/2024
Calc-As Recd	28/05/2024

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

End of Report

Appendix D – Waste Consignment Tickets

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CERTIFICATE OF BULK FIBRE ANALYSIS

PROJECT REF: J207764
CUSTOMER: Complete Regeneration (private customer)
DETAILS: Unit 2
Hanover Street North
Manchester
M34 5HW
SITE DETAILS: MMU Chester Road,
SAMPLED BY: Complete Regeneration (private customer)

CERT NO.: J207764
DATE RECEIVED: 12.03.21
DATE ANALYSED: 15.03.21
DATE REPORTED: (Verbal) 15.03.21
DATE REPORTED: (Document) 15.03.21

Sample No.	Sample Location	Sample Description	Sample Comments	Asbestos Type(s)
BS084739	1 - Below ground - Slab **	Grey/brown fragments	-	Chrysotile Crocidolite

Comments:

UKAS accredited for identification and site sampling. All analysis in accordance with HSG248 - Asbestos: The analysts' guide for sampling, analysis and clearance procedures 2005 and AEC 2 - Procedures manual for asbestos bulk sampling and identification of asbestos fibres.

Descriptions marked '**' in this report/certificate denote information supplied by the customer. AEC cannot take responsibility for the accuracy and representative nature of samples taken by customers. All sample location information given by AEC within the report is the opinion of the surveyor. Sample comments that are **FFP = Fine fibres present, 'but too thin to identify'** or **FFP/AL = Fine fibres present, asbestos like 'but too thin to identify'. Trace = one or two fibres only were identified.** This report shall not be reproduced, except in full, without approval of the laboratory, to provide assurance that parts of the report are not taken out of context.

Asbestos types: Chrysotile = white asbestos; † = Asbestos Amosite = brown asbestos; Crocidolite = blue asbestos; Tremolite; Actinolite; Anthophyllite; NAD = No Asbestos Detected.

Signed:

Print: Steve Cassidy

Position: Lab Analyst

Analysis completed at Manchester Laboratory.
Authorised on behalf of Airborne Environmental Consultants Ltd.

Date: 15.03.21

The Hazardous Waste Regulations 2005: Consignment Note

FOXHALL ENVIRONMENTAL

PART A Notification details

1 Consignment note code: MANCHE/00051

2 The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facesmile):

Manchester Metropolitan University Business School, , Manchester, United Kingdom, M15 6BH
+441612472000,

3 The waste will be taken to (name, address and postcode):

Foxhall Environmental Ltd Foxhall Farm Owler Lane Birstall WF17 9BW

4 The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facesmile):

Complete Regeneration, , Audenshaw,
M34 5HW, +441613711156, gr@complete-r.com

PART B Description of the waste

If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: Removal

2 SIC (2007) for process giving rise to the waste: 39.00 /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are:		Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
			Component	Concentration (% or mg/kg)			
Cement	170605	8 bags	Chrysotile	Less than 1%	Solid	HP5	

The information given below is to be completed for each EWC identified

EWC code	UN identification numbers(s)	Proper shipping name(s)	UN Class(es)	Packing group(s)	Special handling requirements
170605	2590	Chrysotile	9	III	None

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for the subsequent carriers. If schedule of carriers is attached tick here: ☐)

I certify that today I collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements

Where this note comprises part of a multiple collection the round number and collection number are:

/

1 Carrier name: Matthew Tyson
On behalf of (name, address, postcode, telephone, e-mail, facesmile)

Foxhall Environmental Services Ltd, Owler Lane, Birstall, WF17 9BW, +443301188777, info@foxhall-ltd.co.uk

2 Carrier registration no./reason for exemption: CBDU220386

3 Vehicle registration no. (or mode of transport, if not road): DA18 VRK

Signature

Date: 24-03-2021 Time 03:18

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: didge
On behalf of (name, address, postcode, telephone, e-mail, facesmile):

Complete Regeneration, , Audenshaw, M34 5HW, +441613711156, gr@complete-r.com

Signature

Date 24-03-2021 Time 03:18

PART E Consignee's certificate (where more than on waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170605	8 bags	Accepted	D5

1 I received this waste at the address given in A3 on: Date 25-03-2021 Time 14:01

2 Vehicle registration no. (or mode of transport is not road): DA18 VRK

3 Where waste is rejected please provide details:

Name: p Smith
On behalf of (name, address, postcode, telephone, e-mail, facesmile)

Foxhall Environmental Services Ltd, Owler Lane, Birstall, WF17 9BW, +443301188777

I certify that waste/permit exempt waste operation number:

Foxhall FP3297LP

authorises the management of the waste described in B at the address given in A3.

Signature

Where the consignment forms part of a multiple collection, as identified in part C,I certify that the total number of consignments forming the collection are:

Date 25-03-2021 Time 14:01

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PRODUCER'S/HOLDER'S/CONSIGNOR'S COPY (Delete as appropriate)

PART A Notification details

1 Consignment note code: COMPLE/CR003

2 The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facsimile):
Complete Regeneration
Hanover St North
Audenshaw
Manchester M34 5HW

3 The waste will be taken to (name, address and postcode):
Bradley Park Landfill site
Lower Quarry Rd
Huddersfield HD2 1FN

4 The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facsimile):
Manchester Metropolitan Uni.
Chester St
Manchester M1 5GD

If continuation sheet used, tick here ☐

PART B Description of the waste

1 The process giving rise to the waste(s) was: Site preparation SIC (2007) for the process giving rise to the waste: 43120

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
Soil Containing Hazardous substances.	170503*	15000	Metals, TPH	< 1%	Solid	HP7/10/1/14	32 Tonne Tipper

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170503*	UN 3261	Corrosive solid basic organic	9	II	

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are: /

1 Carrier name: Complete Regeneration

On behalf of (name, address, postcode, telephone, e-mail, facsimile):
Hanover St North
Audenshaw Manchester M34 5HW

2 Carrier registration no./reason for exemption:
CBDM 190560

3 Vehicle registration no. (or mode of transport, if not road): PE18 NCU

Signature

Date 28/4/21 Time 0715

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: MICHAEL GRIFFIN

On behalf of (name, address, postcode, telephone, e-mail, facsimile):
Complete Regeneration
Hanover St North
Audenshaw Manchester
M34 5HW

Signature M. Griffin

Date 28/4/21 Time 0700

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170503	18,680	✓	D5

1 I received this waste at the address given in A3 on: Date 28/4/21 Time 0829

2 Vehicle registration no. (or mode of transport if not road): PE18 NCU

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number: EPR/BP3436TH

authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Name: Chris Mc-Eda

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

Bradley Park Waste Management
Lower Quarry Road
Huddersfield
HD2 1FN

Signature Chris Mc-Eda

Date 28/4/21 Time 0829

Appendix E – Complete Regeneration RAMS

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Document No.	**11561**
Version 001	
Title	**JD Building B and K**
Revision	**06**
Date	**17/03/21**

SITE SPECIFIC METHOD STATEMENT

Unit 2, Hanover Street North
Audenshaw
Manchester
M34 5HW

Tel: 0161 206 3000
Email: info@complete-r.com

Client	**Bowmer and Kirkland**
Client Contact	**Gary Lewis**
CRL Job No.	**11561**
Title	**Demolition of onsite building and ground works**
Location	**All Saints Campus, Metropolitan University, Manchester M15 6BH**
Date(s) of Work	**01/02/2021**

Distribution Record

Name	Company	Title	Email
Christopher Sandground	Complete Regeneration	Chief Operating Officer	cs@complete-r.com
Rick Watson	Complete Regeneration	Commercial Director	rw@complete-r.com
Tom Pollitt	Complete Regeneration	Operations Director	tfp@complete-r.com
John Marshall	Complete Regeneration	Contracts Manager	jm@complete-r.com
Richard Clayton	Complete Regeneration	Contracts Manager	rc@complete-r.com

Document No.	**11561**
Version 001	
Title	**JD Building B and K**
Revision	**06**
Date	**17/03/21**

STATUS AND AUTHORISATION

Status	Details *Red text indicates where changes to the document have been made since the last issue.*	Date
01	First Issue	18/12/2020
02	Second issue to client following rescheduled start date	28/01/2021
03	Third issue to client with additional crane and Area 1 Gable Wall method detail added	29/01/2021
04	Sampling suspected AIB	10/02/2021
05	Fifth Issue to client and site team	17/03/2021
06	Updated to suit change in turnover / proof dig works	18/03/21

Prepared By:

Name John Marshall
Title Contracts Manager (CRL) and Anthony Jones (Demolition Supervisor)

Reviewed By:

Name Christopher Sandground
Title Chief Operating Officer (CRL)

Reviewed By:

Name Tom Pollitt
Title Operations Director (CRL)

Document No.	**11561**
Version 001	
Title	**JD Building B and K**
Revision	**06**
Date	**17/03/21**

Reviewed By:
Name **Rick Watson**
Title **Commercial Director (CRL)**

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1. Site Information

1.1 Location	All Saints Campus, Metropolitan University, Manchester M15 6BH
1.2 Description	This is a single storey steel framed structure with metal cladding and glazing to the roof and partially to the top of the side walls. The walls below the glazing have been brick built. The building is situated within the grounds of the University campus.
1.3 Scope of Works	To demolish the building in its entirety, down to the underside of the ground floor slab removing footings and foundations. Remove all the resulting waste materials from site. Demolish the brick stores and boundary wall along the Chester Street elevation. Proof dig areas of new pile locations, grub out existing deep drainage and construct pile mat as per design.
1.4 Traffic Management	All movement of plant, materials, waste materials etc., will be carried out in a manner that will ensure the health and safety of all persons on the site. Segregation of pedestrians and plant/vehicles must be achieved where reasonably practicable. A banksman will be present during the movement of all vehicles to and from the work area. B&K will produce a site specific Traffic Management Plan for this site. All CRL employees and visitors will comply with the requirements of the plan.

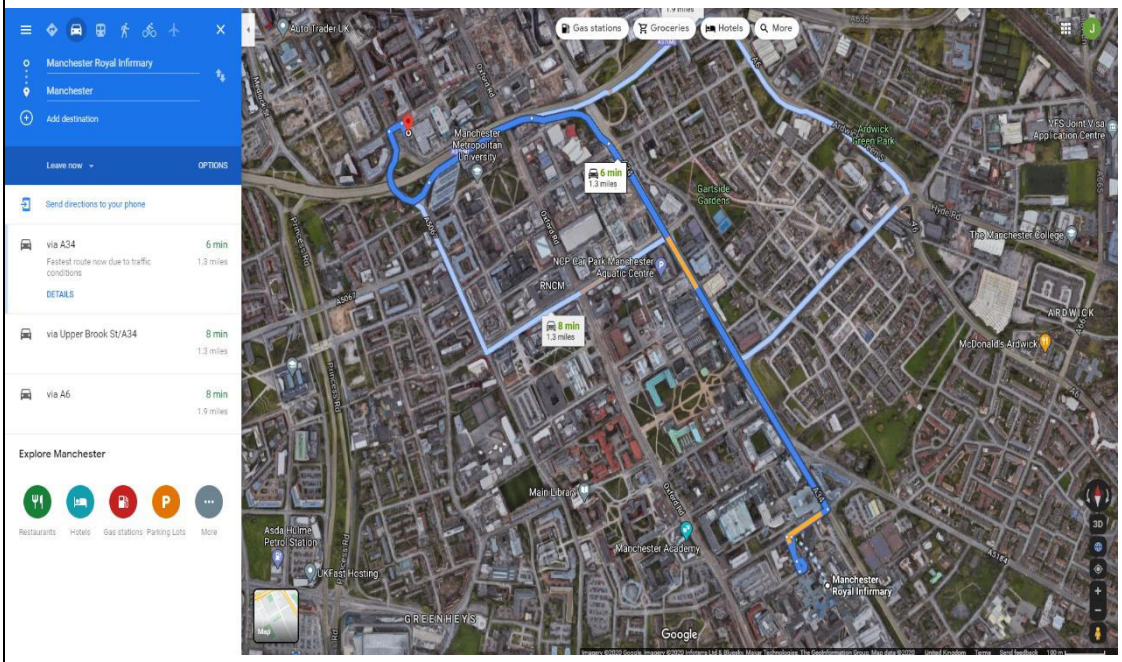
2. Site Safety Arrangements

2.1 Public Protection Arrangements	➢ The areas of work will be closed off by Bowmer Kirkland to prevent access by unauthorised persons.
2.2 Site Welfare	➢ Site Welfare will be provided by Bowmer Kirkland for the duration of the demolition and groundworks.
2.3 Service Isolation Arrangements	➢ All services are to be disconnected by the Client prior to works commencing. CRL require written confirmation of services disconnections before our work starts.
2.4 Signage	➢ Warning notices will be erected on the perimeter of the site to warn of demolition work in progress. Signage will display company contact details in case of emergency.
2.5 Asbestos	➢ A refurbishment and demolition asbestos survey has been carried out. All asbestos based materials identified in the survey will be removed by a licensed contractor prior to CRL works commencing. If any other substance thought to be asbestos is discovered during demolition or strip out works we will stop work immediately, the area will be secured and the site manager notified.
2.6 Temporary Fencing	➢ Any temporary fencing requirements (i.e. exclusion zones) will be provided by Bowmer Kirkland for the duration of the demolition works.
2.7 Security & Storage	➢ All equipment and materials will be removed from site on completion of the works and will not be left unattended during working hours. Equipment will be locked away at the end of each working day. Heavy plant and machinery will be secured and isolated whilst unattended.
2.8 Site Induction	➢ Complete Regeneration's employees will be given a site specific induction by the site manager. A briefing by a competent CRL person will then be carried out and the method statement explained to all operatives who will then sign the briefing record.

3. Emergency Arrangements

3.1 Nearest Hospital

➢ **Directions from site**



3.2 Emergency Numbers

Director	Christopher Sandground - 07866587181
Contracts Manager	John Marshall - 07734871748
Site Supervisor	Anthony Jones – 07734 871750
Environment Agency	0800 80 70 60
Emergency Services	999

3.3 First Aid Arrangements

➢ A first aid box will be available on site along with an appointed first aid trained site supervisor. Richard Clayton – 07786386304.

4.1 Risk Assessments	➢ All Risk Assessments are appended to this document ➢ All Risk Assessments must be read by operatives prior to work and all necessary control measures applied.
4.2 COSHH	➢ All relevant COSHH Assessments for required products are appended to this document. Operatives must be briefed prior to their use with all necessary control measures applied. Asbestos discovered 12,03,21. Analysis report available to client. See below ➢ **Plan of Works** *(Asbestos). Only trained and competent operatives will be involved in this operation. Firstly, the area will be fenced off and segregated from other activities. The area will be dampened down using either water cannon or jetwash. 2 operatives will wear white disposable overalls, FFP3 face masks, suitable gloves and wellies. They will safely enter the excavation, hand pick the ACM and place in the red bag. Then the red bag will be placed into a transparent bag. The double bagged ACM will then be collected by a fully licensed carrier and removed from site. The gloves and overalls used by the operatives will also be double bagged and removed from site. A consignment note will be in place for this activity and made available to the client.*
4.3 Communications	➢ Means of communications on this site will be by mobile phone in designated areas as indicated on site.
4.4 Environmental Controls	All environmental impacts on site will be monitored on a daily basis and controls implemented when and where necessary. **Control of Vibration** will be helped with the use of low vibration plant. To control **noise**, all plant, machinery and vehicles will be fitted with silencers in accordance with the manufacturer's specification. **Dust** suppression will be managed using water sprays were necessary. A water supply is to be provided by the client. All **waste** will be removed to a licensed waste transfer facility. Waste transfer notes will be forwarded to the relevant parties on completion of the project. **Fuels/oils** will be stored in bunded containers to prevent land contamination and spill kits will be kept on site. Refuelling will only be done by operatives who are competent to do so. All reasonable measures will be taken during construction works to prevent **dirt** / **mud** being deposited on the site access road and the main road. Such measures will include, but are not limited to good housekeeping on site and effective traffic management. Measures such as road cleaning will be used if required. Prior to leaving the site the vehicles will be checked to ensure that the wheels are clean and free from debris. If necessary, wheels will be cleaned using a mobile pressure washer. NOTE: where possible, the slabs will be left in-situ for as long as possible to minimise the risk of dirt / mud being carried onto the highway.
4.5 Subcontractor	➢ N/A
4.6 P.P.E	➢ All site personnel including visitors must wear gloves, safety boots, hard hat, high visibility vest and eye protection at all times whilst on site. See attached risk assessment for specific PPE.
4.7 Hypodermic needles	➢ N/A
4.8 Fires	➢ No fires will be allowed on site.

4.9 Hot Work Permit	➢ B+K site management are to issue Hot Works Permits as required on site. All hot works are to be signed off at least 1 hour before the end of each working day and the works area inspected prior to leaving site.
4.10 Temporary Works	➢ No Temporary Works are envisaged at this time.

5. Manpower, Plant Equipment & Materials

5.1 Manpower Required

Site Supervisor	1
Excavator Operator	3
Skilled Operatives	2
Asbestos Appointed Person	1
Brokk Operator	0

5.2 Plant & Equipment

Demolition Excavator	3
Skip Wagon	Numerous
Hiab	0
Generator	As required
Hand tools	As required
Pneumatic tools	As required
Compressor	As required
MEWP	0

.

5.3 Mobile Scaffold Towers

➢ When required Access towers will be erected by PASMA trained operatives. Once erected, the towers will display a scaff tag indicating that it has been passed as safe to use. Towers will be checked daily before use or when altered. Incomplete scaffolds will display a scaff tag notice prohibiting use.

5.4 Operatives

➢ Operatives working on site will be fully experienced and will hold current CPCS/CCDO/CSCS cards dependant on task / role. Copies of relevant qualifications and cards will be held on site. We also have a First Aider and Asbestos Appointed Person.

5.5 Plant

➢ Heavy plant will carry a "Record of Thorough Examination of Lifting Plant and Equipment". Copies will be in the site file. Demolition excavators will be fitted with a demolition guard. Once accepted on site our machines will display a B+K sticker.

5.6 Working Hours

➢ Working hours on site will be 0730 to 1730 Monday to Friday weather permitting for outside works. Additional weekend of out of hours work is to be agreed with the client as required.

6. Methodology, Work Types and Tasks

On arrival to site, operatives will attend a site induction delivered by the site manager.

The CRL Demolition Manager is to brief the supervisor on the method of work and work areas, prior to commencing any works. The CRL site supervisor is to ensure that all operatives who attend site are fully conversant with the methods of work and risk assessment. The site supervisor is to constantly review the risk assessments and method statement to ensure they are still relevant and amend them, in consultation with the Site Manager, or Contracts Manager if required, if new hazards are identified.

All personnel will sign the briefing sheet below to indicate their understanding and compliance to the RAMS.

The supervisor will give daily activity briefings prior to commencing work.

6.1 Sequence of Tasks

Task 1	**Strip out works**
Task 2	**Mechanical demolition/ suspected AIB testing**
Task 3	**Crushing of Demolition Material**
Task 4	**Demolition of brick stores and boundary wall**
Task 5	**External Steel Framework and Crane**
Task 6	**Gable Wall Adgacent to John Dalton Building**
Task 7	**Hand Digging to locate services**
Task 8	**Turn-over works**
Task 9	**Drainage grub out**
Task 10	**Construct Piling Mat**

6.2 Methodology	Site welfare will be provided by the client. All plant and equipment will be delivered prior to works beginning with plant being off loaded by the haulage contractor. All operatives involved in the demolition works must have received a CRL site induction and understood this document. Your understanding of this RAMS must be recorded by signing Section 7. All operatives must sign in/out of the CRL site by using the daily register in the welfare facility. Records of the site activities, deliveries and any monitoring results must be collated, including a daily diary of the works for each day. **Task 1 Strip out works** Operatives will strip out the premises removing any loose materials, ceiling tiles and floor coverings. The ceiling tiles to the office area will be removed by operatives working from step podiums or tower scaffold. As the tiles are removed, they will be passed to operatives at floor level who will stack them ready to be taken outside and loaded into a skip, ready for removal from site. The floor coverings to the office area will be removed by operatives using long handled floor scrapers. The loosened coverings will then be taken outside and loaded into a skip ready for removal from site. **Task 2 Mechanical demolition** When the strip out work has been completed, a hydraulic excavator using various attachments will proceed to demolish area 1 as in the demolition phasing drawing appended to this document (ref: ManMet SE- Asbestos Removal and Demo Phasing Plans- Draft- 10.12.20). The first attachment used will be a rotating grab, which will be used to remove the roofing materials i.e. glazing and roofing sheets. The steel frame work will be cut down using a hydraulic shear attachment. During the course of the demolition the differing materials will be separated for re-cycling purposes and loaded into the appropriate skips for removal from site. The masonry materials will be stockpiled on site ready to be crushed at a later date. When the Area 1 structure has been completed, the machine will proceed to demolish Area 2 through to Area 3 and then Area 4. The demolition procedure will be the same as for area 1. As Area 2 is being demolished, a 2nd machine fitted with a hydraulic breaker will proceed to break out the concrete slab and footings to Area 1. When the breaking out to Area 1 has been completed, this machine will follow behind the machine carrying out the demolition in Area 2 and begin breaking out the concrete slab and footings to area 2 working towards Area 3 and then Area 4. Note: the sequencing of the Areas may change depending on the progress of the asbestos removal works. Should this sequencing change, this method statement is to be amended and upreved accordingly.

Sampling suspected AIB – A trained operative with FFB3 Half face fit mask and white overalls will enter the isolation are with the purpose of retrieving a sample of the suspectedAIB. The sample piece will be picked and placed into a plastic bag and then double bagged to be taken off site to be sampled and analysed.

Task 3 Crushing of Demolition Material
When the demolition and breaking out has been completed, both machines will have buckets attached to grub up the broken out concrete and stockpile it for crushing. When an area has been cleared sufficiently enough for the crushing machine, the crusher will proceed to crush the masonry. The crusher will be CRL's ARJES 250 licensed mobile crusher.

One of the machines will load the hopper of the crusher with the concrete and brick masonry. The 2nd machine will periodically clear the crushed materials away from the conveyor belt. This will be the procedure until all the concrete and brick has been crushed and stockpiled for use by the client. On completion of the works, the site will be left in a tidy condition, ready for follow on trades.

Task 4 Demolition of brick stores and boundary wall
The pavement will be partially closed by Bowmer & Kirkland to enable the following task to be carried out.
The metal capping that covers the top of the wall will be removed by operatives working from a tower scaffold (erected by competent persons) and using suitable sized sockets to undo the retaining bolts. As each section of the capping has been loosened, it will be passed down to operatives inside the site area. These operatives will then stack the panels to one side ready to be loaded into a skip for removal from site.

When all the capping has been removed, a hydraulic excavator fitted with a rotating grab attachment will be used to take down the inside walls. The walls will be taken down in sections with the grab, each grab full will then be placed out to one side ready for removal at a later stage.

The wall to the pavement side will be sawcut to create smaller sections, each cut will be undertaken in between the existing expansion joints. A Stihl saw fitted with a masonry cutting blade and a water supply for dust suppression will be used for this task. The smaller sections of wall will then be taken down using the machine with the grab attachment, the masonry will all be loaded into a skip ready for removal from site. On completion of this work, the area will be left in a tidy and safe condition ready for follow on works by others.

Task 5 External Frame and Crane
The external crane and steel frame will be demolished mechanically using an appropriately sized excavator fitted with a cutting shear (either a 36t or 29t machine). The area around the crane and frame will be isolated, with a banksman stationed on the Chester Street pavement to ensure no pedestrians are present during any cutting activity.

The excavator will proceed to use a mechanical shear attachment to cut the yellow crane and the parallel blue steel beam which each connect perpendicular to the leg frames. This will be conducted by creating cuts at the road side, then partial cuts at the building side to allow the sections of these two components to pivot (around the cuts) and be lowered to the ground.

Once the yellow crane section and blue steel have been removed the steel leg frame (with intact uprights and top section) closest to the roadside will be pulled in towards the building and to the ground by the machine. Once safely down to the ground, it will be cut up and size reduced. The same process will be repeated for the steel frame (with intact uprights and top section) closest to the building side, with this section being pulled in the opposite direction.

Having cut up the steel frames and crane, the sections will be loaded into a skip and removed from site with the area being left clean and tidy.

Task 6 Cable Wall Adgacent to John Dalton Building
A 14Ton excavator with rubber tracks will be working along the outside of the hoarding between JD Tower and John Dalton Building. While the machine is working along the elevation, the area will be always barriered off with a banksman in attendance.

The area along the gable will be isolated as will the internal of the single storey building. Starting from roof level of the building, the glass panels will be broken by the machine, with glass falling into the internal of the stripped-out building. Once the glass has been removed, the machine will proceed to demolish the brick gable wall underneath the removed windows. The brick gable wall will be demolished so the brickwork falls internally. The brickwork will be reduced down to a level dictated by the external perimeter fencing, which will then restrict machine access. This process will be repeated until all the windows and gable walls are down to external hoarding height. Once this process is complete the machine and barriers will be brought inside the site boundary and the area left in a clean and tidy condition.

Task 7 Hand digging to locate services
A hydraulic excavator will remove the tarmac covering from above one of the areas to be hand dug, when the tarmac has been removed, using spades, operatives will carefully dig out the spoil until they locate the cables below, when located, the operatives will move to the next area and repeat the process. Before mechanical excavation, Complete Regeneration will always ensure a B+K Permit to Dig in place.

Task 8 Turnover works
Once the structural slab has been removed we can begin the turnover process. The site is broken up into different phases each with a different turnover process. The workforce should familiarise themselves with this drawing and supervisors should ensure the correct procedures are followed. The basement area to the South shall be proof dug to 1.8m and backfilled. The depth of layers isn't critical here as this will later be dug out by others. The next area will be Phase 1 which is generally the footprint of the new building. Here we need to

	proof dig to 1.8m in locations of new piles then backfill in 300mm layers and compact using a 120 roller, 8 passes. The areas in between new pile locations are turned over to a depth of 750mm and compacted in 2 layers. Once B+K engineer confirms we have reached formation level (underside of 300mm piling mat) we will organise CBR tests (number and locations to be confirmed by B+K). Once required CBR values are reached, we will begin constructing Piling Mat. **Task 9 Drainage Grub Out** There is an existing drain running through the middle of the site from North to South. It is a 600mm diameter brickwork culvert which requires removal. Once B+K confirm we can remove we will obtain Permit to Dig and excavate down onto drainage. The excavation will be stepped back to ensure safety against trench collapse. Once drainage is fully excavated out we will begin to backfill as per earthworks specification. The parts of the drainage outside footprint of new building will be backfilled with hardcore in 200mm layers and compacted. The part of the drainage that is within the footprint of the new building will be backfilled with the same material dug out and compacted in 200mm layers. Roller driver will only enter excavation when it has been deemed safe by supervisor/competent person. B+K will be notified of any unchartered services we may come across. **Task 10 Construct Piling Mat** Once areas have been 'turned over' and the required CBR values have been achieved, the Piling Mat process will begin. B+K will be given an oppurtunity to inspect the formation level for soft spots etc. Should soft spots be encountered they will be dug out to a depth of at least 500mm and backfilled with processed hardcore. We will lay Tenax HM3 Geogrid flat on the formation level and then lay a 300mm layer of 6F2 and compact sufficiently. Then a further 10 CBR tests will carried out, with a CBR of atleast 2% required.

7. Site Specific Method Statement Briefing Record

7.1 Briefing Content	**The following sections of this site specific method statement have been briefed:**	
	Site Information	**Tick**
	Site Safety Arrangements	

	Emergency Arrangements	
	Site Specific Risks and Controls	
	Site Diagrams and all Appendices	

7.2 Briefing Details

Supervisor in Charge of the Work
The Supervisor is responsible for reviewing all methods contained within this document as the work proceeds. Any amendments or revisions identified either before or during the contract should be directed to the Contracts Manager or H&S Director for approval and incorporation into the latest revision. Any changes or amendments will be communicated to all parties concerned.

I confirm that I have read and understand the requirements of this method statement and associated risk assessments and will ensure their communication to operatives under my control and to those who may be affected by our work.

Name TBA		**Date**	**TBA**
Signature		**Time**	

7.3 Briefing Attendance and Declaration

I have had the method of work explained to me and I have read and understood the Method Statement. I am aware that if for any reason I cannot carry out the work as instructed, I must stop working and inform my supervisor

Print Name	Signature	Date

8. Risk Assessment

8.1 Risk Assessments

- **Asbestos**
- **Dust**
- **Environmental Risk Assessment**
- **Fire and First Aid**
- **Housekeeping**
- **Manual Handling**
- **Movement of Skips**

	➢ **Noise** ➢ **Pedestrians on Site** ➢ **Refuelling Plant** ➢ **Personal Hygiene** ➢ **Public Protection** ➢ **Plant work in Demolition** ➢ **Plant Marshall** ➢ **Working Around Plant in Demolition** ➢ **Power Access Platforms** ➢ **Crushing**
8.2 COSHH Assessments	➢ **Diesel** ➢ **Hydraulic Fluid** ➢ **Engine Oil** ➢ **Multi Purpose Grease** ➢ **Silica Dust**

RISK ASSESSMENT ASBESTOS	
HAZARDS	Asbestos fibres
EFFECTS	Asbestosis, respiratory problems, mesothelioma, lung cancer

RISKS	Risk is calculated by multiplying the likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 x Severity 5 = Risk 15
PERSONS AT RISK	Site operatives, visitors and members of public
MONITORING	Constant monitoring for safe practice by supervisor, regular monitoring by contracts manager and health and safety manager.
NOTES	All work is to be carried out in accordance with H.S.E. guidance HSG210.
PPE	• Hi Visibility clothing • FFP3 mask (face fit tested) • category 3 type 5&6 disposable overalls • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety wellies with protected toe cap and mid sole

<u>preventive & precautionary measures</u>

- All personnel working with asbestos are to be trained in non-licensed asbestos removal.
- Asbestos containing products should be double bagged/wrapped and secured with duct tape then attach an asbestos sticker before collection from site.
- Cement asbestos products are to be removed whole whenever practicable to avoid the release of asbestos fibres
- All personnel working with asbestos materials must wear FFP3 dust masks and category 3 type 5&6 disposable overalls. These must be disposed of with asbestos products. Steel toe cap wellies must also be worn as these can be cleaned off.
- Drivers carrying asbestos waste should be in possession of a consignment note. Speak to our hire desk to organise licensed carriers.

NEW RISK RATING	Likelihood 1 x Severity 5 = risk 5 16/04/2019

TRADE: DEMOLITION	
HAZARDS EFFECTS	Dust, windy conditions Respiratory problems, aspergillosis and eye irritation, pollution
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 2 X Severity 5 = Risk 10
PERSONNEL	Everyone on site and in surrounding areas
Potential dust source	• Mechanical and hand demolition • Chutes for dropping demolition materials to ground level • Mechanical loading of materials into skips • Crushing of material for reuse • Vehicle routes • Dry sweeping during clean up
PPE	• Hi Visibility clothing • FFP3 mask (face fit tested) • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety boots with protected toe cap and mid sole

PREVENTIVE & PRECAUTIONARY MEASURES

- Operations that generate significant levels of dust are to be sprayed with water before and during work.
- Dry sweeping will be avoided
- FFP3 Dust masks that have been face fitted to the wearer, and eye protection must be worn by all operatives during operations that create a significant level of dust.
- Dust masks and eye protection will be available on site for the use of all our operatives and issued as necessary by our site supervisor.
- Suitable and sufficient welfare facilities must be provided to allow the operator to maintain a high standard of personal hygiene.

NEW RISK RATING	Likelihood 1 X Severity 5 = Risk 5 04/02/2019

ENVIRONMENTAL RISK ASSESSMENT

HAZARD	Pollution Dust Spills Waste Fuel usage Water usage Noise and Vibration
Waste	Ensure stored waste does not cause harm to the environment by • Covering skips before they leave site • Keeping waste materials away from waterways • Dispose of special and hazardous waste as soon as possible in the appropriate manner Ensure waste is minimised by applying the waste hierarchy in all instances. Where possible, segregate waste for recycling and re-use. All waste will be carried by licensed carrier and disposed of through licensed transfer stations or recycling facilities.
Noise and vibration	Identify if any noise or vibration limits have been set and adhere to them. Vibration and noise dampened equipment will be used wherever possible. Traffic movements will be kept to a minimum to prevent avoidable noise and vibration. Ensure plant is switched off when not in use and prevent over-revving. Noisy equipment will wherever possible be located away from sensitive receptors e.g. housing. Where this is not possible, if practical, suitable noise barriers will be placed around the source of the noise.
Chemicals/pollutants (Diesel)	Chemicals will be stored in bunded containers. Spill kits will be available on site in case of spillages Diesel will be stored away from waterways Any spillages will be reported immediately to site management
Dust	In dry or windy conditions where dust could be problematic, the working area and skips will be dampened down using a fine water spray
Asbestos	An asbestos survey will be carried out prior to demolition works commencing and any notifiable asbestos discovered will be removed by a licensed company before demolition works start. If any asbestos is discovered during the demolition phase, works will stop immediately and the area secured until samples are taken and analysed.

RISK ASSESSMENT - FIRE	
LOCATION: Demolition Site	
HAZARDS EFFECTS	Piles of waste, flammable liquids, naked flames Damage to property, fatality, burns
RISK	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood – 5, Severity – 3, Risk = 15
PERSONS AT RISK	People working nearby, site operatives, members of public
NOTES	In particular, risks should be considered where operatives are working inside buildings.

PREVENTIVE & PRECAUTIONARY MEASURES

- Waste will be collected regularly to avoid the build up of materials.
- Where necessary, diesel for refuelling will be brought to site and taken away after refuelling.
- No smoking allowed on site.
- Fire exit points to be kept clear at all times.
- Fire extinguishers will be on site at all times.

An individual fire plan will be available for each building where internal work is being carried out. Operatives should be aware of their nearest exit point at all times and know what to do in the event of a fire. This is to be covered at site induction and daily as the site changes.

NEW RISK RATING	Likelihood 2 X Severity 3 = Risk 6 16/04/2019

RISK ASSESSMENT (HOUSE KEEPING)	
TRADE: DEMOLITION	
HAZARDS	Musculoskeletal injuries, cuts, abrasions caused by trips, fall.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. LIKELIHOOD 4 SEVERITY 3 = RISK 12
PEOPLE AT RISK	All site operatives
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by contracts manager and health and safety manager.

PREVENTIVE & PRECAUTIONARY MEASURES

- Keep all walkways/pedestrian and vehicular routes clear from debris.
- Materials are to be stockpiled in designated areas.
- The demolition area is to be left safe at all work intervals to prevent falling debris.
- Materials are to be removed from site at regular intervals to prevent unnecessary build up.
- Where possible materials are to be placed directly into skips for removal from site.
- All materials are to be separated into various commodities e.g. timber, steel, concrete etc for disposal.

NEW RISK RATING	LIKELIHOOD 1 X SEVERITY 3 = RISK 3 19/10/20

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RISK ASSESSMENT
MANUAL HANDLING

Date assessed:
Work Activity/Task: Clearing loose items from building **Location of task:**

Hierarchy of Control
1. Can manual handling be avoided? N
2. Can work equipment or other measures to prevent injury be provided? Y

Task does it involve;	**Yes**	**No**	**The Working Environment are there;**	**Yes**	**No**
Holding loads away from trunk?		x	Limitations on movement?		x
Twisting?	x		Lack of working space?		x
Stooping?	x		Uneven/slippery/unstable floors/ground?		x
Reaching/lifting above shoulder height?		x	Poor lighting conditions?		x
Long carrying distance?		x	Strong air movements?	**x**	
Strenuous pushing or pulling?		x	Hot/cold/humid conditions?	**x**	
Repetitive movement?	x				
Load – is it;			**Individual Capability – does the job**		
Heavier than 25 kgs?		x	Require unusual strength/height?		x
Bulky?		x	Pose possible hazard to those with a health problem?		x
Difficult to grasp?		x	Call for additional information/training?		x
Intrinsically harmful (e.g. sharp/hot)? Allow hot materials to cool before handling (e.g after hot cutting).		x			
Unpredictable in movement?		x			

RISK	Likelihood 5 x severity 5 = risk 25
Control Measures	• All heavy or bulky objects are to be either broken down into manageable sections or moved by use of mechanical aid e.g wheelbarrow • A good level of housekeeping is to be maintained on site at all times. • Hand protection will be supplied and issued to all employees. • All site operatives will receive regular safety awareness training which incorporates safe manual handling techniques. • maximum 1 person lift 25kg
RESIDUAL RISK	Likelihood 2 x Severity 5 = Risk 10

RISK ASSESSMENT (MOVEMENT OF SKIPS)	
TRADE: DEMOLITION	
HAZARDS EFFECTS	Moving vehicles, collision, impact, crushing Impact/crush injuries, fatalities and entrapment.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 x severity 5 = risk 15
PEOPLE AT RISK	All site operatives
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by contracts manager and health and safety manager .
PPE	• Hi Visibility clothing (red banksman vest for the banksman) • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • Safety boots with protected toe cap and mid sole.

PREVENTIVE & PRECAUTIONARY MEASURES

- The skip wagon driver is to contact site supervisor by mobile phone prior to entering the site to ensure that a banks-man will be present when he arrives.
- If a banks-man is not present on arrival **do not enter the site**. Pull over and park the vehicle in a safe position, then speak to the site supervisor or the contracts manager for guidance.
- The driver will issue the banksman with a red hi viz vest. The banksman will return it to the driver as the driver leaves site.
- If a driver loses sight of the banks-man he should stop the vehicle immediately.
- People who do not need to be in reversing areas should be kept well clear.
- Drivers must wear high visibility clothing, safety boots, hard hat and eye protection when outside the vehicle on a site.
- The load should be inspected to ensure its stability
- Lock the back door of the skip before lifting
- Lift the skip slightly and then climb out of the cab to ensure the hook has fully engaged the lifting bar of the skip and then climb back into the cab to complete the lift.
- Before leaving site, at the exit point, climb out to check there is no loose debris caught in the wheels.

NEW RISK RATING	Likelihood 1 x severity 5 = risk 5 19/10/20

RISK ASSESSMENT - NOISE	
TRADE: DEMOLITION	
HAZARDS EFFECTS	Noisy activities Temporary or permanent damage to hearing, inability to hear warnings of other dangers on site, adverse effects to concentration and or producing irritability, both increases the likelihood of accidents.
RISK RATING	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood – 3, Severity – 4 = Risk 12
PERSONS AT RISK	Operatives, sub-contractors and members of the public
PPE	• Hi Visibility clothing • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety boots with protected toe cap and mid sole • Hearing protection conforming to EN 352-2
MONITORING	Constantly monitored by the site supervisor for safe practice. Regularly monitored by the Contracts Manager and Health and Safety Manager. Noise monitoring will be periodically carried out by H&S manager during site inspections
CONTROL MEASURES	• Preventative measures must include assessing if the task can be done a different way that is less noisy, if it is impractical, use the quietest plant or equipment available. • How equipment is to be used on site must be assessed. If an operative cannot communicate with someone 2m away without shouting the noise is probably loud enough to damage their hearing and further measures are needed. • Attempt to control noise at source e.g. by fitting mufflers to breakers or drills. • All operatives exposed to noise must be warned of it, what is being done about it and what is required of them to minimise the risk. • Only people involved in the work should be in the area of noise where possible. • Create an exclusion zone in particularly noisy areas. • If it is not possible to sufficiently reduce the noise hazard, operatives must wear ear plugs or ear defenders of the correct attenuation but this must never be done to replace noise control and elimination at source.
NEW RISK RATING	Likelihood 1 x Severity 4 = Risk 4 19/10/20

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RISK ASSESSMENT Pedestrians on Site	
HAZARDS EFFECTS	Moving vehicles and plant, Bad visibility, Uneven ground, Impact, Entrapment, Fatalities, Slips Trips and Falls
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 X Severity 5 = Risk 15
PERSONS AT RISK	Workers on site, Site Visitors
NOTES	A traffic management plan is in place and should be read before walking on site. Visitors should be accompanied at all times.
PREVENTIVE & PRECAUTIONARY MEASURES • Where pedestrian routes are present, these must be used. • All pedestrians, particularly site visitors walking around the site must wear high visibility clothing. • **At no times** should any person approach an item of working plant or a heavy goods vehicle from behind. If anybody needs to enter the working area (10m) around the machine they must approach the machine from the front and get the attention of the operator from a safe distance (greater than 10m). Only approach the machine once the equipment is grounded and the operator has indicated that it is safe to approach. • Vehicles must be accompanied by a banksman on site	
NEW RISK RATING	Likelihood 1 X Severity 5 = Risk 5 19/10/20

RISK ASSESSMENT (REFUELING PLANT)	
HAZARDS	Slips trips & falls, flammable liquid, pollutant, irritant
EFFECTS	Skin disorders, pollution, burns, fire
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 x severity 3 = risk 9
People at risk	Site supervisor, labourers, plant operatives and wagon drivers.
PPE	• Hi Visibility clothing • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety boots with protected toe cap and mid sole
MONITORING	Constantly monitored by supervisor. Regularly monitored by contracts manager and health and safety manager.

PREVENTIVE & PRECAUTIONARY MEASURES

- All fuels are to be delivered to site in a bunded container manufactured for the containment of gas oil and the like.
- Refueling must not take place in the close proximity of grids, manholes, or water courses.
- All operatives are to wear rubber gloves whilst refueling.
- Careful consideration is to be given when choosing the location for refueling to minimise the risk of fire, contamination etc
- All spillages are to be reported to the site supervisor immediately.
- Exposure to fuel must be reported to the site supervisor and treatment given in accordance with COSHH regulations.
- Spill kits will be available in case of spillages
- A drip tray will be used whilst refueling

NEW RISK RATING	Likelihood 1 x severity 3 = risk 3 25/07/2017

RISK ASSESSMENT (PERSONAL HYGIENE)	
TRADE: DEMOLITION	
HAZARDS EFFECTS	Infections, disease (i.e. wiel's disease) Contamination, infection, fatality
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 x severity 3 = risk 9
PEOPLE AT RISK	All site personnel.
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by contracts manager, site manager and principal contractor where necessary.

PREVENTIVE & PRECAUTIONARY MEASURES

- Prior to commencement on site, management shall identify all areas of the works that has the potential to cause infections or disease.
- Such work items would include manual handling of discarded materials, toilets and urinals and any work involving live or redundant drainage.
- Wherever possible the risk shall be eliminated by using mechanical methods of demolition and disposal.
- Where mechanical demolition is not possible all personnel involved will wear protective overalls and gloves.
- Washing facilities will be available on site and all operatives will observe a good standard of personal hygiene.
- Hands should be washed prior to eating.
- All personnel will receive regular safety awareness training.

NEW RISK RATING	Likelihood 1 x severity 3 = risk 3 19/10/20

RISK ASSESSMENT- PUBLIC PROTECTION	
TRADE: DEMOLITION	
HAZARDS	Moving vehicles, flying/falling debris, dust, noise, slips trips & falls
EFFECTS	Musculoskeletal injuries, fatalities, cuts, abrasions caused by trips, falls, falling debris, collisions with vehicles.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. LIKELIHOOD 5 SEVERITY 5 = RISK 25
	Members of the public.
MONITORING	Constantly monitored by site supervisor for safe practice. Regularly monitored by contracts manager
PPE	• Hi Visibility clothing • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety boots with protected toe cap and mid sole

PREVENTIVE & PRECAUTIONARY MEASURES

- The site will be securely fenced off to separate the working area from the general public.
- The site perimeter will be checked at the start and end of each shift to ensure there are no breaches in the fence/hoarding.
- Warning notices will be erected around the perimeter of the site to warn the public of demolition work in progress.
- Mandatory site PPE requirements will be displayed at the site entrance.
- Damping down of skips and work area will be in progress in certain conditions to prevent the spread of dust.
- A banksman will be present when our vehicles are entering or leaving the site and will wear a red hi vis vest.

NEW RISK RATING	LIKELIHOOD 1 X SEVERITY 5 = RISK 5 19/10/20

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RISK ASSESSMENT **PLANT WORK IN DEMOLITION**	
HAZARDS **EFFECTS**	Moving parts, Electricity, Fumes, Falling debris, Noise, Vibration, Impact, Entrapment, Electrocution, Fume inhalation, Fatalities, Whole body vibration, Noise induced hearing loss.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 X Severity 5 = Risk 15
PPE	• Hi Visibility clothing • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • Safety glasses CE certified to EN166, optical class 1 and impact F • Safety boots with protected toe cap and mid sole
PERSONS AT RISK	Banksman, Site operatives, Plant operatives and Wagon drivers

PREVENTIVE & PRECAUTIONARY MEASURES

- All services are to be terminated outside the working area.
- A banksman must be present when plant is being used for demolition or lifting purposes.
- The plant operator and banksman are to ensure that the demolition and slewing areas are clear of any other operatives before the commencement of works.
- All demolition excavators will be fitted with demolition guards.
- All lifting plant used on site is to have a certificated 12 monthly insurance inspection as required by the LOLER regulations.
- When working in the vicinity of overhead cables a safe working area is to be clearly marked.
- All operatives working on site are to wear orange high visibility vests.
- All our plant and machinery has been individually tested for noise emissions and under normal working conditions all equipment has a general working noise level less than 80db and generally around 75db. Increased noise levels are present during breaking out. Hearing protection should be worn where noise levels are 80db or above and is mandatory at 85db and above.
- Before manoeuvring the operator should ensure that the slewing area is clear. Manoeuvring an excavator in reverse is forbidden unless accompanied by a Banksman. If there is no Banksman present slew around and operate in a forward motion.
- When operatives are working around the machines always ensure that the bucket is grounded and that the dead man lever is in a neutral position. Only call the operatives into the working area when the above is in place. Do not re-engage the dead man until the operatives have retreated to the safe area.
- Pipes located in ducts should be cut prior to being pulled by the machine, where there is a risk of damage to the structure.

NEW RISK RATING	Likelihood 1 X Severity 5 = Risk 5

RISK ASSESSMENT Plant Marshall	
TRADE: Demolition	
HAZARDS	Impact, Falling load, Crushing
EFFECTS	Fatality, Musculoskeletal injuries, Cuts, Abrasions.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 3 X Severity 5 = Risk 15
PERSONS AT RISK	Banksman, Site operatives, Pedestrians
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by contracts manager and health and safety manager.
PPE	• Hi Visibility clothing • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety boots with protected toe cap and mid sole

PREVENTIVE & PRECAUTIONARY MEASURES

- Only competent persons are to act as a Plant Marshall.
- Plant Marshalls are required during demolition works requiring plant.
- A thorough understanding of the hand signals to be used must be agreed with the Plant Operator prior to work commencing.
- The Plant Marshall must check that there are no persons in the vicinity of the working areas before demolition proceeds and only give the signal to proceed when safe to do so.
- The Plant Marshall must be visible to the Plant Operator at all times. They must locate themselves away from the immediate demolition area in a location where they can see behind the structure to be demolished. If more than one Marshall is required to give all round visibility this should be agreed before commencement and the same procedure repeated.
- If anybody other than the Plant Marshall should approach the demolition area the Marshall must give the signal to stop work.
- The Plant Marshall should be visible to the plant operator at all times. If visual contact cannot be achieved radio contact must be used.
- The Plant Marshall must notify the plant operator if he needs to leave the working area for any reason.

NEW RISK RATING	Likelihood 1 X Severity 5 = Risk 5	24/5/2019

RISK ASSESSMENT - WORKING AROUND PLANT IN DEMOLITION

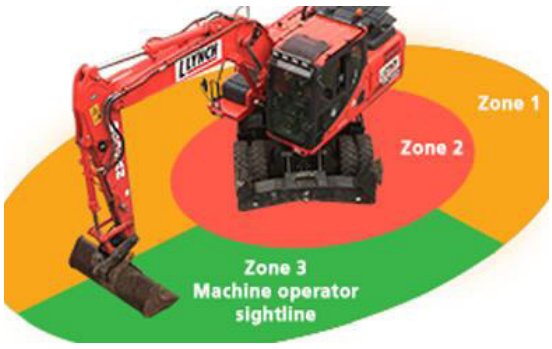
HAZARDS EFFECTS	Moving parts, Bad visibility, Voids Impact, Entrapment, Fume inhalation, Fatalities, Noise induced hearing loss
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is too high and appropriate measures are to be taken to reduce risk. Likelihood 3 x Severity 5 = risk 15
PERSONS AT RISK	Site supervisor, Labourers, Site visitors.

NOTES

PREVENTIVE & PRECAUTIONARY MEASURES

- The plant operator is to ensure that the demolition and slewing areas are clear of any demolition operatives before the commencement of works and ensure that the plant banks-man is in an agreed location constantly visible to the operator.
- If the plant banks-man needs to leave the working area at any time they must agree this with the plant operator first to ensure he knows where he is **at all times**.
- All operatives working on site are to wear orange high visibility clothing.
- All our plant and machinery has been individually tested for noise emissions and under normal working conditions all equipment has a general working noise level less than 80db and generally around 75db. Increased noise levels are present during breaking out, Hearing protection should be worn where noise levels are 80db or above and is mandatory above 85db.
- **At no times** should any operative approach the plant from behind. If anybody needs to enter the working area (10m) around the machine they must approach the machine from the front and get the attention of the operator from a safe distance (greater than 10m). Only approach the machine once the equipment is grounded and the operator has indicated that it is safe to approach.
- The plant operator must ensure that the working area is level and clear from voids.

Exclusion zones around a working excavator



Zone 1:
Only to be entered if not able to enter the work area at zone 3 (for example if it is in a debris drop zone). Zone 1 should only be entered after the operator is aware and he has given the thumbs up sign.

Zone 2:
No entry into this zone. If the excavator is turned off, this zone can be entered for certain tasks (for example refuelling).

Zone 3:
This is the safest zone as in the operator's line of sight. However, should only be entered once the operator is aware and he has given the thumbs up sign.

Operator:
Should always lower the boom and operate the dead man switch when there is someone entering into these zones.

NEW RISK RATING - Likelihood 1 x Severity 5 = risk 5 24/5/2019

RISK ASSESSMENT (POWERED ACCESS PLATFORMS)	
TRADE: Demolition	
HAZARDS EFFECTS	Moving parts, work at height, fall of material. Collision with overhead structures and cables, contact with moving machines or pedestrians. Impact, shearing,, cuts, abrasions, entrapment, electrocution, fatalities.
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over 10 is considered to be too high and appropriate measures are to be taken to reduce risk. LIKELIHOOD 3 X SEVERITY 5 = RISK 15
PERSONS AT RISK	Machine operators, other workers, members of the public, unauthorized users
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by safety manager.
NOTES	Inspection test certificate and defects reporting sheets to be kept on site at all times.

PREVENTIVE & PRECAUTIONARY MEASURES

- Operating instructions must be read and available on site.
- Only authorized and trained personnel carrying the certification to operate the machine may do so.
- All MEWPS shall be visually inspected daily by the operator and a record of the inspections kept on site.
- The MEWP is to be worked from a firm level base.
- No lifting over people.
- The MEWP must operate within an exclusion zone where pedestrians must not enter and MEWPs must not work outside of.
- A competent person must be available at ground level at all times to lower the basket in the event of an emergency.
- The platform must be lowered before being moved.
- All work is to be carried out from within the basket, there must be no climbing from the basket.
- Materials stored within the cage must not exceed the safe working load and should be secured at all times.
- The safe working load must be displayed at all times and never exceeded.
- Harnesses must be worn in boom type MEWPS. In scissor type MEWPs harnesses may be required if deemed necessary by the risk assessment.
- Harnesses when required to be worn must be attached to manufacturer's anchorage points.
- Remove keys when not in use.
- Where visibility is restricted, movements to be controlled by qualified banks man.

NEW RISK RATING	Likelihood 1 X Severity 3 = Risk 3

RISK ASSESSMENT MOBILE CRUSHING PLANT	
HAZARDS	Moving parts, Noise, flying/falling debris, manual handling, silica dust, crushing, entanglement, instability of machine due to uneven ground.
EFFECTS	Fatality, musculoskeletal injury, eye damage, noise induced hearing loss, entrapment, cuts and abrasions, respiratory problems, silicosis
RISKS	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 4 X Severity 5 = Risk 20
PEOPLE AT RISK	Plant operator and all site operatives.
PPE	• Hi Visibility clothing • FFP3 mask (face fit tested) – if required • Hard hat conforming to EN ISO 20345 • Gloves conforming to BSEN 388:2003 • safety glasses CE certified to EN166, optical class 1 and impact F • safety boots with protected toe cap and mid sole • Hearing protection conforming to EN 352-2
MONITORING	Constantly monitored by supervisor for safe practice. Regularly monitored by contracts manager and health and safety manager.

PREVENTIVE & PRECAUTIONARY MEASURES

- Only personnel who hold a current CSCS card for the category of crushers and screeners are to operate the crushing plant.
- The area to be used for crushing must be surveyed to ensure stability of the ground.
- The operator will be in control or the area surrounding the crusher and will act as banks-man. Anyone failing to adhere to the operator's instructions in the crushing area will be asked to leave the site until re-inducted in site safety.
- The plant operator will be supplied with suitable ear defenders disposable overalls and any other appropriate PPE.
- Whilst the plant is in operation all mechanical moving parts are to be fully guarded to prevent entrapment.
- A suitable handrail will be maintained to prevent the operator falling into the jaws of the plant.
- At no time will any operator enter the jaw area whilst the plant is in motion.
- The plant will be isolated and stationary before any maintenance work is carried out.
- The plant fitter is to hold the keys to the plant whilst carrying out maintenance work.
- A direct or temporary bowser water supply is to be used to suppress dust emissions to avoid the spread of silica dust.
- The operator is to ensure that all site personnel are well clear of the plant before maneuvering.

NEW RISK RATING	Likelihood 1 X Severity 5 = Risk 5 25/07/18

COSHH ASSESSMENT - DIESEL

Product Name(s):	**Diesel**	Assessed By:	Tom Pollitt
Date	**19/10/20**		
Main Hazards	Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or Explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.	Task/Activity People At Risk	Refueling Mechanics/fitters Machine drivers Van/wagon drivers
Health Risks	Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage.	Risk Phrases:	**R40** - limited evidence of carcinogenic effects **R65-** Harmful, may cause lung damage if swallowed **R66-** Repeated exposure may cause skin dryness or cracking **R51/53-** Toxic to aquatic organisms

SUBSTANCE PROPERTIES

							
Highly Flammable	Oxidiser	Explosive	Corrosive	Toxic/Very Toxic	Irritant	Dangerous to The environment	Highly Flammable
Low	No	yes	yes	Yes	Yes	Yes	No

ROUTE EXPOSURE						PERSONS AT RISK				
Skin	/	Eyes	/	Inhalation	/	Users of the Product	/	Members of the Public		Visitors
Ingestion	/	Cuts/ Abrasions	/	Injection	/	Other Workers		Young Persons		

Environmental Controls	**Personal Protection**			
Spillage ➢	 HYPERLINK "javascript:productDetail(14,'menulevel%3d2%26level%3d2%26catcode%3d105','25204F','858');"		 HYPERLINK "javascript:productDetail(17,'menulevel%3d2%26level%3d2%26catcode%3d105','25208F','862');"	 HYPERLINK "javascript:productDetail(8,'menulevel%3d2%26level%3d2%26catcode%3d105','25006F','859');"
➢	Yes	Yes	No	yes

➢				
➢				

Disposal ➢				

ADDITIONAL CONTROL MEASURES

General Precautions

- Keep out of reach of children
- Avoid contact with skin
- Wear suitable protective clothing and gloves
- Wash hands before eating or drinking
- Avoid excessive inhalation of fumes.
- Do not wash diesel contamination into drains and waterways.

Fire Precautions

First Aid

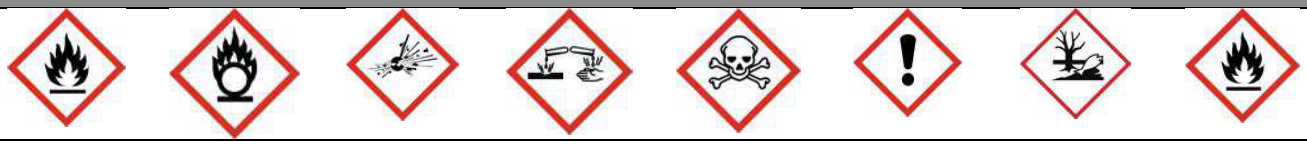
- **Inhalation** – Remove from further exposure. If having difficulty breathing seek medical advice.
- **Ingestion -** If swallowed do not induce vomiting, seek medical advice immediately.
- **Skin Contact –** Remove contaminated clothing, dry wipe exposed skin and cleanse with waterless hand cleaner first then with soap and water.
- **Eyes-**Flush thoroughly with water.

- Keep away from all sources of ignition.
- In case of fire use CO2, dry chemical or foam, NOT water

COSHH ASSESSMENT – HYDRAULIC OIL

Product Name(s):	**Hydraulic Oil**	Assessed By:	**Tom Pollitt**
Hazardous Ingredients		Date:	**19/10/20**
Main Hazards	**No significant hazards**	Task/Activity	**Motor vehicle maintenance/repairs**
Health Risks	Excessive exposure may result in eye, skin, or respiratory irritation. Low order of toxicity. High-pressure injection under	Risk Phrases:	**R65**

SUBSTANCE PROPERTIES



Highly Flammable	Oxidiser	Explosive	Corrosive	Toxic/Very Toxic	Irritant	Dangerous to the environment	Highly Flammable
no	No	no	yes	no	Yes	yes	No

ROUTE EXPOSURE				PERSONS AT RISK			
Skin	x	Eyes	Inhalation	Users of the Product	x	Members of the Public	Visitors
Ingestion	x	Cuts/ Abrasions	Injection	Other Workers		Young Persons	

Environmental Controls	**Personal Protection**	
Spillage ➢ Shut off at source ➢ Absorb in sand or inert material ➢ Collect in container, keep enclosed. ➢ Do not allow spillage into drains **Disposal**	 HYPERLINK "javascript:productDetail(14,'menulevel%3d2%26level%3d2%26catcode%3d105','25204F','858');"	
	Oil resistant gloves	Yes

ADDITIONAL CONTROL MEASURES

General Precautions

- Avoid direct contact whilst handling
- Store in cool well ventilated area, keep container tightly closed
- Do not discharge into drains or rivers
- Avoid extremes of temperature.
- Avoid strong oxidising agent.

Fire Precautions

First Aid

Symptoms

- May cause lung damage if swallowed
- Skin; May be mild irritation at site of contact
- Eyes; May be irritation and redness

Inhalation: Under normal conditions of use inhalation of vapours is
Not feasible or likely to present an acute hazard.

- Suitable extinguishing media: Foam, Water, Dry Powder, CO2 , Earth.
- Unsuitable extinguishing media: Water Jet.
- Special exposure hazards in fire: Hazardous combustion products may include a complex mixture of airborne solid and liquid particulates and gases (smoke)

Skin contact: Skin contact does not normally require first aid, but oil soaked clothing should be removed, and contaminated skin washed with soap and water. If persistent irritation occurs, medical advice should be sought without delay.
Eye contact: Flush the eye with copious quantities of water. If irritation persists refer for medical attention.
Ingestion: DO NOT induce vomiting. If ingestion is suspected, wash out the mouth with water and send to hospital immediately.

COSHH ASSESSMENT – ENGINE OIL

Product Name(s):	Engine Oil	Assessed By:	Tom Pollitt
Main Hazards	Local exhaust ventilation is recommended when excessive product misting occurs.	Date:	**19/10/20**
Hazardous Ingredients		Task/Activity	Motor vehicle maintenance/repairs
Health Risks	Long or repeated contact can cause dermatitis.	Risk Phrases:	**R22,R36**

SUBSTANCE PROPERTIES



Highly Flammable	Oxidiser	Explosive	Corrosive	Toxic/Very Toxic	Irritant	Dangerous to the environment	Highly Flammable
no	No	no	no	yes	yes	yes	No

ROUTE EXPOSURE				PERSONS AT RISK			
Skin		Eyes	x	Inhalation	x	Users of the Product	x	Members of the Public		Visitors	
Ingestion	x	Cuts/ Abrasions		Injection		Other Workers		Young Persons			

Environmental Controls	**Personal Protection**	
Handling and storage ➢ Avoid direct contact with the substance ➢ Store in cool, well ventilated area. Keep container tightly closed.	 HYPERLINK "javascript:productDetail(14,'menulevel%3d2%26level%3d2%26catcode%3d105','25204F','858');"	
	Yes	Yes

➢ Soak up with absorbent material and shovel up **Accidental release measures** ➢ Shut off at source, turn leaking containers leak side up. ➢ Do not allow spillage into drains **Disposal** Dispose of as special waste		

ADDITIONAL CONTROL MEASURES

General Precautions

- Avoid strong oxidisers
- Use in well ventilated area
- Avoid ingestion

Fire Precautions

- Use foam and CO2.

First Aid

Symptoms

- Skin – may be mild irritation at site of contact
- Eyes – may be irritation and redness
- Ingestion – contact doctor immediately

Treatment

- Skin -Wash immediately with plenty of soap and water
- Eyes -Bathe eye with running water for 15 minutes
- Ingestion –consult doctor immediately, do not induce vomiting

COSHH ASSESSMENT - MULTIPURPOSE LITHIUM GREASE			
Product Name(s):	**Multipurpose Lithium Grease**	Manufacturer	**Comma**
Description of Substance:		Assessed By:	**Tom Pollitt**
Workplace Exposure Limits:	**Contains no hazardous ingredients at or above regulatory disclosure limits**	Date:	**19/10/20**
Task/Activity	**Motor vehicle maintenance/repairs**	Risk Phrases:	**n/a**
		Safety Phrases:	n/a
	Comma Oils and Chemicals Ltd	Telephone/ Fax No's.:	

Document No.	**11561**
Version 001	
Title	**JD Building B and K**
Revision	**06**
Date	**17/03/21**

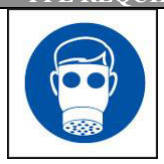
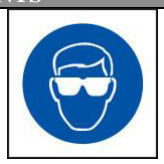
Suppliers Name & Address:	**Dering Way Gravesend**	MSDS Attached	Yes

SUBSTANCE PROPERTIES

							
Highly Flammable	Oxidiser	Explosive	Corrosive	Toxic/Very Toxic	Irritant	Dangerous to the environment	Highly Flammable
No	No	No	Yes / No	Yes / No	Yes / No	yes	Yes / No

ROUTE EXPOSURE						PERSONS AT RISK					
Skin	x	Eyes	x	Inhalation		Users of the Product	x	Members of the Public		Visitors	
Ingestion		Cuts/ Abrasions		Injection		Other Workers		Young Persons			

PPE REQUIREMENTS

						Other	Other
HYPERLINK "javascript:productDetail(14,'menulevel%3d2%26level%3d2%26catcode%3d105','25204F','858');"		HYPERLINK "javascript:productDetail(17,'menulevel%3d2%26level%3d2%26catcode%3d105','25208F','862');"	HYPERLINK "javascript:productDetail(20,'menulevel%3d2%26level%3d2%26catcode%3d105','25206F','860');"	HYPERLINK "javascript:productDetail(8,'menulevel%3d2%26level%3d2%26catcode%3d105','25006F','859');"	HYPERLINK "javascript:productDetail(11,'menulevel%3d2%26level%3d2%26catcode%3d105','25007F','861');"		
Yes – oil resistant	Yes / No	No	No	Yes	No	No	No

ADDITIONAL CONTROL MEASURES

General Precautions	**Control Measures**
➢ Avoid direct contact whilst handling ➢ Store in cool well ventilated area ➢ Do not discharge into drains or rivers	➢Stable under normal conditions,- avoid sources of ignition, strong oxidising agents and strong acids
First Aid/Hygiene Arrangements	**Fire Precautions**
➢ Skin; wash with plently of soap and water ➢ Eyes; bathe the eye with running water for 15 minutes ➢ Ingestion; there may be irritation of the throat	➢ extinguishing media; alcohol or polymer foam, CO2, powder ➢ In combustion emits toxic fumes ➢ Wear breathing apparatus if fighting fire

Document No.	**11561**
Version 001	
Title	**JD Building B and K**
Revision	**06**
Date	**17/03/21**

COSHH ASSESSMENT - OXYGEN

Product Name(s):	Oxygen for burning/welding	Assessed By:	Tom Pollitt
Main Hazards	Compressed gas. Oxidant. Strongly supports combustion. May react violently with combustible materials.	Date:	**24/5/2019**
Task/Activity	Hot cutting/welding	Risk Phrases:	R8 Strongly supports combustion.
Health Risks	No toxicological effects from this product.		

SUBSTANCE PROPERTIES



Highly Flammable	Oxidiser	Explosive	Corrosive	Toxic/Very Toxic	Irritant	Dangerous to the environment	Highly Flammable
no	No	yes	no	no	no	no	No

ROUTE EXPOSURE				PERSONS AT RISK			
Skin	Eyes	Inhalation	x	Users of the Product	x	Members of the Public	Visitors
Ingestion	Cuts/ Abrasions	Injection		Other Workers	x	Young Persons	

Environmental Controls	**Personal Protection**
Handling and storage ➢ Use no oil or grease. ➢ Open valve slowly to avoid pressure shock. ➢ Segregate from flammable gases and other flammable materials in store. ➢ Suck back of water into the container	 HYPERLINK "javascript:productDetail(14,'menulevel%3d2%26level%3d2%26catcode%3d105','25204F','858');" Yes  Yes General Precautions ➢ Do not smoke while handling product. ➢ Avoid oxygen rich (>21%) atmospheres. ➢ Clothing impregnated with oxygen should be ventilated by walking in fresh open air for 15 minutes. ➢ Use in well ventilated area

must be prevented. Do not allow back feed into the container. ➢ Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. ➢ Keep away from ignition sources (including static discharges). Refer to supplier's container handling instructions. ➢ Keep container below 50°C in a well ventilated place. **Accidental release measures** ➢ Try to stop release. ➢ Evacuate area. ➢ Ensure adequate air ventilation. ➢ Eliminate ignition sources. ➢ Post warning notices (including no smoking). ➢ Prevent from entering sewers, basements and work pits or any place where its accumulation can be dangerous. **Disposal** To atmosphere in a well ventilated place. Do not discharge into any place where its accumulation could be dangerous	

ADDITIONAL CONTROL MEASURES

Fire	**First Aid**
Specific hazards ➢ Supports combustion ➢ Non flammable ➢ Exposure to fire may cause containers to rupture/explode. **Suitable extinguishing media** All known extinguishers can be used. ➢ **Specific methods** If possible, stop flow of product. Move away from container and cool with water from a protected position	**Inhalation** Not hazardous. **Ingestion** Ingestion is not considered a potential route of exposure.

COSHH RISK ASSESSMENT			
Substance	Respirable Crystalline Silica (Silica Dust)		
Task/Activity	Using demolition hammers/breakers General clearing of rubble (sweeping and shoveling) Crushing demolition hardcore (bricks, concrete, ceramics, slates)	**Date Assessed by:**	**19/10/20** Tom Pollitt
Chemical Characteristics	Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica and may become respiratory size particles when workers chip, cut, drill, or grind objects that contain crystalline silica.		

Routes into Body **Effects**	Inhalation Silicosis - This is a serious lung disease causing permanent disability and early death.	
Risks	Risk is calculated by multiplying likelihood and severity on a 1 –5 numerical basis 1 being low and 5 being high. 0-10 is considered to be low risk. Any number over ten is considered to be too high and appropriate measures are to be taken to reduce risk. Likelihood 4 x Severity 5 = Risk 20	
People at Risk	Anyone within the area who can breathe in the dust	
Monitoring	Constantly monitored by supervisor for safe practice. Regularly monitored by Contracts Manager and Health and Safety Manager. Dust masks will be face fit tested to the user.	
PPE	FFP3 mask (face fit tested)	
Preventive & Precautionary Measures **Tell workers:** • That dust from stone, brick, tile and concrete can cause silicosis, which leads to disablement and early death; • to avoid breathing in dust;		

• to do the job in the correct way and minimise dust clouds; • FFP3 dust masks that have been face fitted must be worn by all operatives during operations that create a significant level of dust likely to contain silica. • Operations that generate significant levels of dust are to be sprayed with water before and during work. • to always use the dust suppression and extraction equipment properly; • to keep this equipment clean and working properly; • if equipment is not working - report it; • to keep their protective equipment clean, and wear it properly; • to wash dust off skin • to avoid cotton or knitted clothing • Suitable and sufficient welfare facilities must be provided to allow the operator to maintain a high standard of personal hygiene.		
NEW RISK RATING	Likelihood 1 x Severity 5 = Risk 5	

Appendix F – United Utilities Application

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Supplementary guidance for the selection of water pipes in land potentially affected by contamination

Introduction

In January 2011, UK Water Industry Research (UKWIR) published "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21; the 'UKWIR Guidance'). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as "land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated." The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions "*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*".

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the 'UUW Guidance') which includes the Risk Assessment for Water Pipes (the 'RA').

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication "Model Procedures for the Management of Land Contamination" (ref: CLR11) that sets out whether the land through which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be

necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 "Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or

b) more suitable pipe materials; or

c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175:2011 “Investigation of Potentially Contaminated Sites Code of Practice”

CLAIRE/CIEH “Guidance on comparing soil contamination data with a critical concentration” 2008

Department of the Environment Contaminated Land Research Report “Sampling strategies for contaminated land” prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency “Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination” (ref: R&D Technical Report P5-066/TR) 2000

Environment Agency “Model Procedures for the Management of Land Contamination” (ref: CLR11), 2004

Environment Agency P5-080/TR3 “The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils”, 2005

UK Water Industry Research (UKWIR) "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21)” January 2011

Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 “Laying Pipes in Contaminated Land” 2002

United Utilities
helping life flow smoothly

About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

Risk Assessment for Water Pipes (RA)

The risk assessment for water pipes will help you choose appropriate materials for your development. We are happy to deal with a risk assessment for water pipes in advance of any formal application for a new water supply.

If you need any help completing the form please call us on 0845 026 4296.

When completing this form electronically, the larger text boxes will expand in height if required.

Section 1: Development Details	
Development Name *(if it has one)*	MMU Science & Engineering University, Temporary Water Connection
Development Address	Department of Engineering, Manchester Metropolitan University, John Dalton Building
OS Grid Reference *(mid point)*	SJ840972
Developers Name	Bowmer & Kirkland
UUW reference number *(for UU use only)*	

Please provide details below of the current and historical use of the site and adjacent sites.

If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.

The site entrance is located off Chester Street in Manchester city centre. It is currently part of the MMU Faculty of Science and Engineering formely comprising two buildings with the eastern building recently demolished for redevelopment and ground turned over to around 1m bgl. Post demolition ground invetsigtaion has recently been undertaken with trial holes and samples taken in close proximity to the proposed pipeline route.

The earliest available historical mapping (1850s) shows the site comprised terraced housing until 1965 when houses were demolished. In 1974, the John Dalton College of Technology Building was built and renamed to 'Manchester Polytechnic' (John Dalton Building) in 1985-1990.The surrounding area was occupied by cottons mills and printing works to the north between 1848-1932. By 1951, large areas of residential housing to the south west have disappeared potentially dueto bombing during WWII. The Mancunian Way was constructed to the south by 1975 and buildings to the north demolished by 1999.

Section 2: Preliminary Risk Assessment	
Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No

If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection.

If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.

N/A

Section 3: Intrusive Site Investigation	
Have you completed any intrusive site investigation?	☒ Yes ☐ No
Date(s) when the site investigation(s) undertaken	Pre Demo SI- February 2019, December 2019 Post Demo SI- April 2021
At what level has groundwater been encountered?	>1.70 metres below ground level or ☐ Not encountered
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. *If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.*	
Groups not tested including ethers, nitrobenzene, ketones, aldehydes, amines, phenols, VOCs and SVOCs were determined to be unnecessary by the preliminary conceptual site model with respect to previous site uses.	
If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE please provide details below of the rationale behind the intended pipe selection. *If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.*	
N/A	

Section 4: Site Remediation	
Please provide details below of any site remediation (which may include a change in site levels) already completed. *If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.*	
N/A This assessment is for the temporary water supply pipe connection only ahead of any site remediation or construction works.	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?	☐ Yes ☐ No ☒ N/A
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. *If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.*	
N/A	

Section 5: Final Use of Site
Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection. *If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.*
Diesel will be stored on site in locked and bunded containers.

What water pipe materials are intended to be used on site?	☐ PE ☒ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B Other (please specify):

Section 6: Additional Information
Please use the section below to provide any additional details to support your intended pipe selection. *If your supporting information has additional information to support your intended pipe selection, please reference below the relevant sections of your report.*
Proposed pipeline route attached. Enrivonmental analysis results from the recent post demoliton ground invetsigtaion have been reviewed from TP1001, TP1003 and TP1004. These are considered the most relavant given these were undertaken in close proximity to the proposed pipeline route, beneath the footprint of the former JD West building. No free phase contamination identfied. Exceedances are identfied in TP1001 in a sample obtained from 1.0m bgl for EC10-EC16 aromatic and aliphatic hydrocarbons.

Section 7: Risk Assessor	
Name and relevant qualifications of person directing the risk assessment for water pipes	Rob Allen BSc (Hons) MSc FGS MCIWEM C.WEM CEng
Name and address of risk assessor's company	Curtins, 17-19 Whitworth St W, Manchester M1 5WG
Date risk assessment performed	16/12/2020

Section 8: Declaration			
I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.			
Name	Rob Allen	Company	Curtins
Phone Number	0161 236 2394	Date	23/04/2021

Please e-mail the completed form and supporting information to water.connections@uuplc.co.uk. Alternatively you can fax a paper version to 01925 678926 or post to us at United Utilities Water, Metering and Connections, Ullswater House, Lingley Mere, Warrington, WA5 3LP.



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02/12/04/995

Table 1 - Pipe Selection Risk Assessment Summary (PSRAS)	
1) *Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.* 2) *If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.*	
What materials have been tested to populate Table 1 below?	☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg								
Test Group	**Testing Required?**	**PE threshold**	**Metal Pipes/ Barrier Pipe**	**Laboratory Detection Limit**	**Testing UKAS accredited Y/N**	**Maximum concentration at proposed pipeline depth** See Note [2]	**Maximum site concentration** See Note [3]	**Locations and depths where concentrations exceed proposed pipeline threshold**
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	-	-	-	-	-
Total BTEX & MTBE		0.1	Pass	0.001	Y	0.001	0.001	-
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	-	-	-	-	--
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.01	Y	1.01	2	-
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	1	Y	50	50	TP1001 at 1.00m
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	1	Y	278	278	-
Phenols* (from SVOC analysis)		2	Pass	-	-	-	-	-
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	-	-	-	-	-
Ethers*	Only where identified	0.5	Pass	-	-	-	-	-
Nitrobenzene*		0.5	Pass	-	-	-	-	-
Ketones*		0.5	Pass	-	-	-	-	-
Aldehydes*		0.5	Pass	-	-	-	-	-
Amines		Fail	Pass	-	-	-	-	-
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]	-	-	-	-	-

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.

Appendix G – Barrier Pipe Specification

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AVK UNDERGROUND FIRE HYDRANT, SQUAT TYPE, PN 16 — 29/388-001

DN80

The Series 29/388 is a squat fire hydrant suitable for use with water and neutral liquids, to a maximum temperature of 70°C. Complies with requirements of BS 750 and BS EN1074-2:2000 and EN 14339:2005, underground hydrants. Also to BS EN 1074-6 for potable (drinking) water.

Product description:
Underground fire hydrant squat type for water and fire protection to max. 70° C

Standards:
- Designed according to BS750:2012, Designed according to EN 1074 part 1 & 2, Designed according to EN 14339:2005
- WIMES 8.09 Compliant

Test/Approvals:
- Max operating pressure:16 Bar
- Hydraulic test to BS 750, Seat: 1.1 x PN. Body: 1.5 x PN. Operating torque test
- Resistance to operating load - MOT - 105NM - MST - 210NM
- Kitemarked to BS750
- WRAS approved for cold water use
- Drinking Water Inspectorate Regulation 31 compliant

Features:
- Inlet flange universally drilled to EN1092-2 PN10/16 and BS10 TableD/E.
- BS 750 Type 2c. Screwed -down type with screwed 2½" round thread outlet.
- Complies with Annex ZA of BS EN 14339 in respect of Construction Products Directive (CPR)(EU) 305/2011.
- Temperature Range: -10°C to +70°C, Insulation essential for temperatures of 0°C and below.
- Fully maintainable.
- Low weight design.
- 2½" London round thread outlet to BS 750.
- Exceeds flow requirements: Kv = 92 minimum 2000l/min @1.7 bar. Actual: Kv = 96, 2092 l/min @1.7 bar.
- Auto-frost drain valve as standard
- Fixed stopper.
- Corrosion resistant construction, ductile iron coated with WRAS approved epoxy coating Blue RAL 5017, to 250 microns min. Holiday free in accordance with WIS 04-52-01, compliant with BS EN 1074-6 for disinfection products.
- Note: It is recommended that applications in a corrosive atmosphere or sited in exposed locations use a stainless steel stem 1.4404 (316) and all exposed fasteners in A4 stainless steel. Product reference S.29/389.
- **Options:**
  - PN25 version, Loose stopper available, Outlet options: • Stainless steel (standard) or Gunmetal to BS 750 round thread • Instantaneous (Morris) • Belfast • London "V" thread • Internal screwed Norwegian • Bayonet (Dublin).

Accessories:
Hydrant security device - AVK Series 29/10



KM 53897
BS 750

WRAS APPROVED PRODUCT

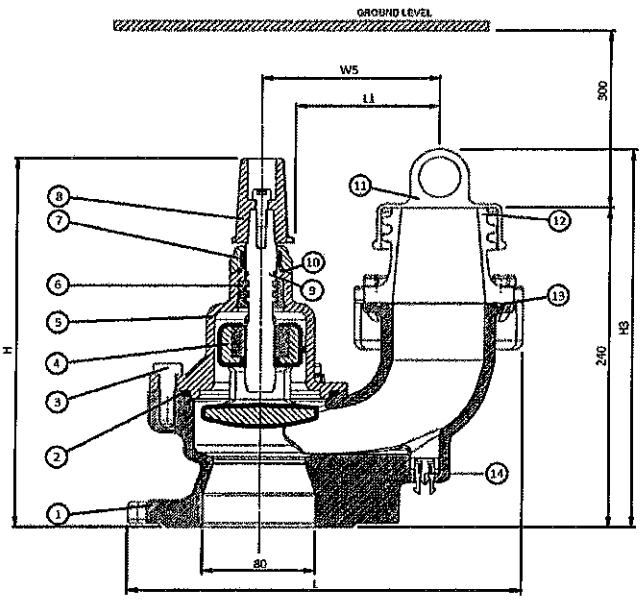
Expect... AVK

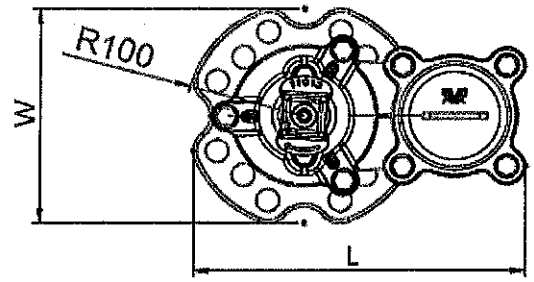
The designs, materials and specifications shown are subject to change without notice due to the continuous development of our product programme.

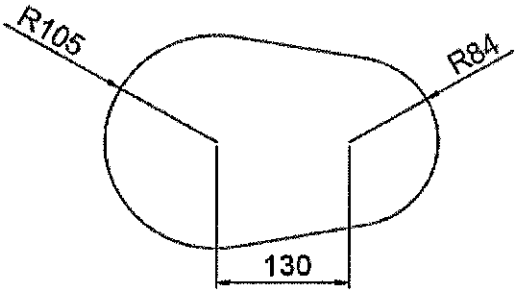
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AVK UNDERGROUND FIRE HYDRANT, SQUAT TYPE, PN 16 — 29/388-001

DN80







Minimum Clear Area of Surface Box & Cover

Component list:

1. Body	Ductile iron GJS-500-7 (GGG-50)	8. Stem cap	Ductile iron GJS-500-7 (GGG-50)
2. Body-bonnet seal	NBR rubber	9. Stem	Stainless steel 1.4021
3. Fasteners	Stainless steel A2	10. Gland flange seal	NBR rubber
4. Stopper assembly	Ductile iron GJS-500-7 (GGG-50)	11. Dust cap	PE
5. Bonnet	Ductile iron GJS-500-7 (GGG-50)	12. Outlet	Stainless steel 1.4021
6. Thrust collar	Brass, DZR CW602N	13. Body-outlet seal	NBR rubber
7. Gland flange assembly	Ductile iron GJS-500-7 (GGG-50)	14. Auto-frost valve	Nylon 6.6, Body and plunger with NBR WRAS approved O-rings and stainless steel spring to DIN17224

Components may be substituted with equivalent or higher class materials without prior notification.

Reference nos. and dimensions:

AVK ref. no.	DN	H	H3	L	L1	W	W5	Theoretical
	mm	mm	mm	mm	mm	mm	mm	weight / kg
29-388-3-2112 (1)	80	278	284	283	102	190	127	13

(1) Dimensions are approximate and may vary due to tolerances.

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PROTECTA-LINE

THE TRIED & TRUSTED BARRIER SYSTEM



WHY RISK IT?



THE ORIGINAL, TRIED AND TRUSTED BARRIER PIPE SYSTEM

Protecta-Line is the original barrier pipe system that you can trust to transport drinking water through contaminated land. It has been tried and tested by water companies and housebuilders for more than 20 years.

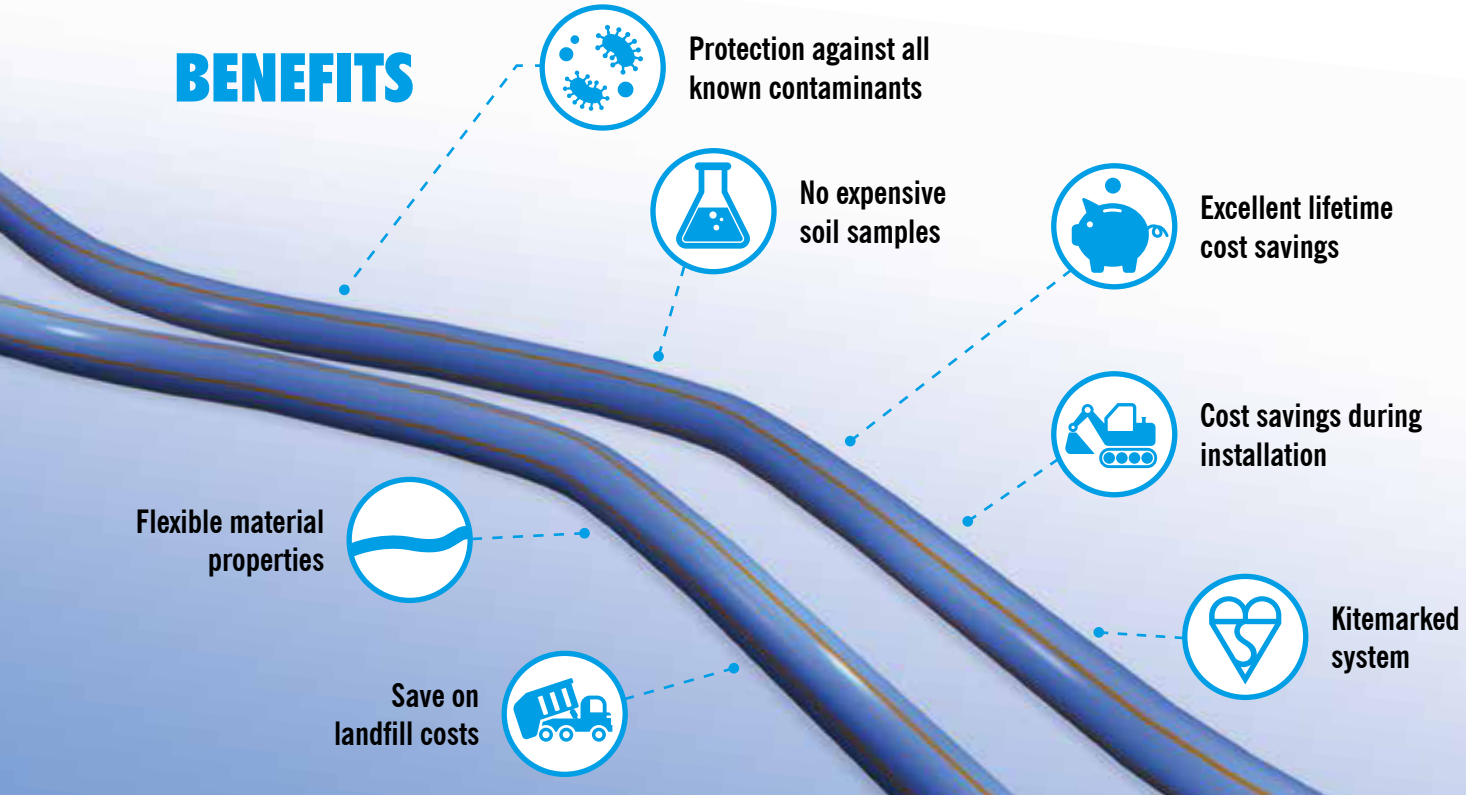
It has been proven over that time to maintain long term safety of supply and keep water safe from surrounding contaminants.

It is the most widely installed barrier pipe system in the UK.

There is no other system that has been developed hand-in-hand with contractors and installers over such a long term. The present day system has attained the highest standards of quality approval and represents a comprehensive barrier pipe solution, incorporating a full range of dedicated, approved fittings.

Put simply, why would you risk using anything else?

BENEFITS



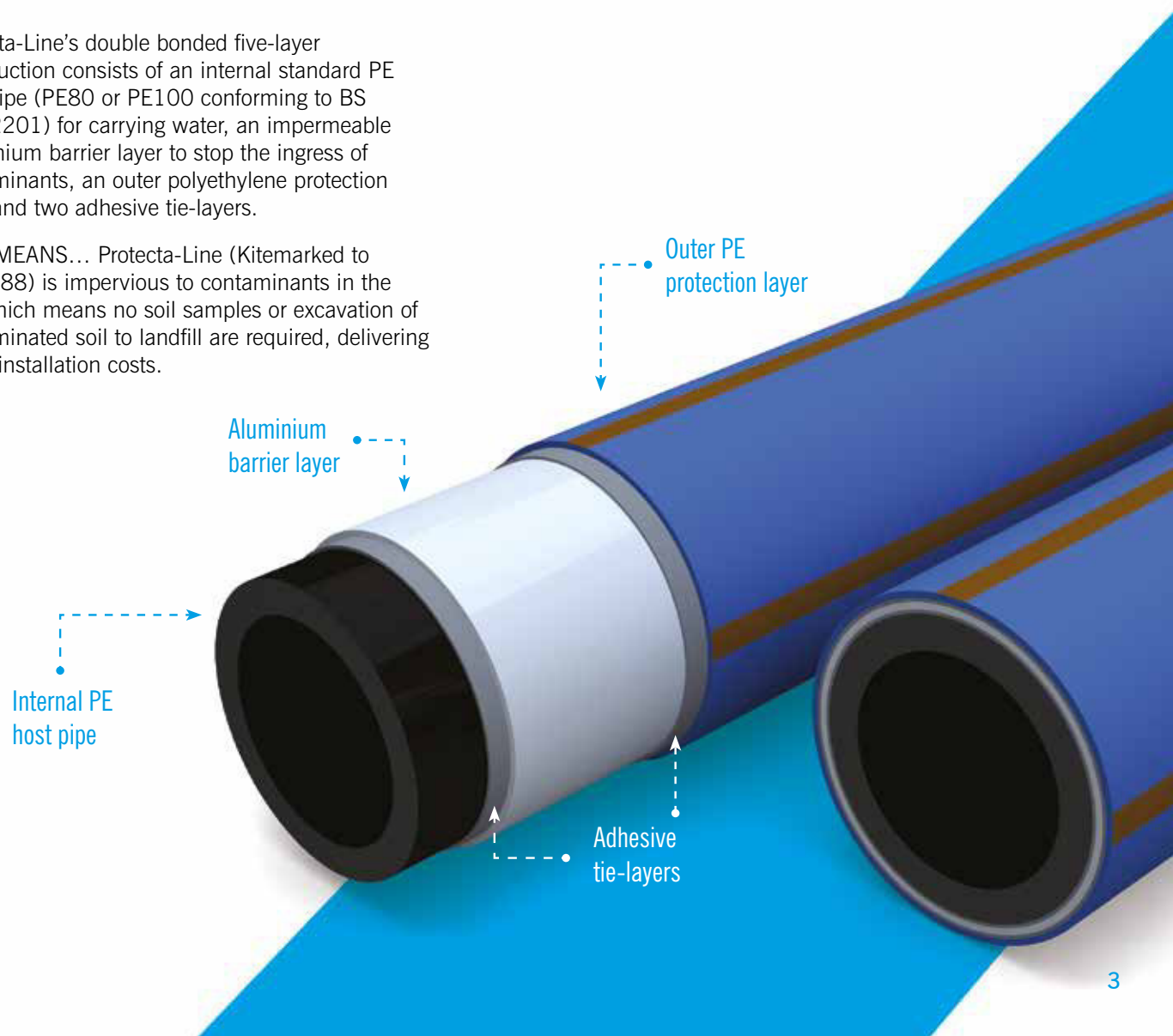
PROTECTA-LINE...

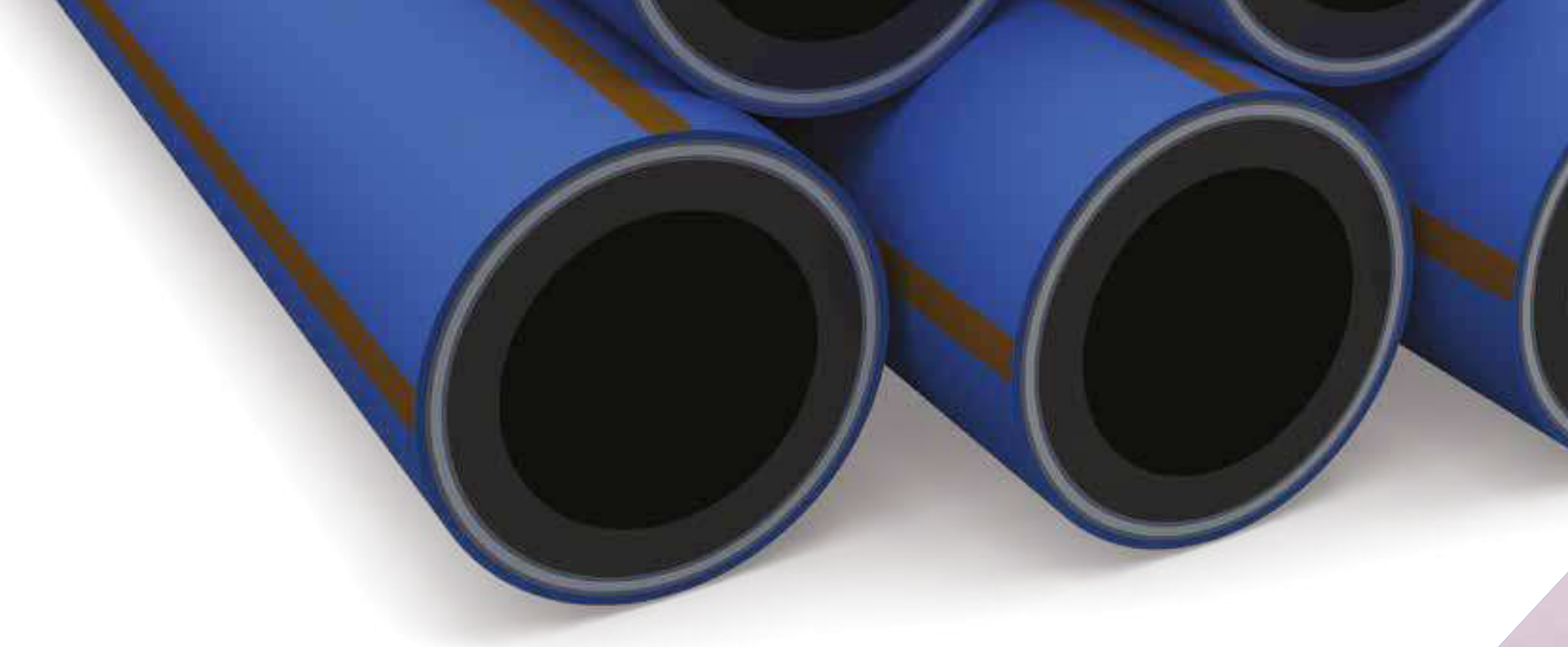
- provides proven protection against all recognised brownfield contaminants, both organic and inorganic, even in their maximum reported concentrations.
- is suitable for corrosive conditions.
- ensures peace of mind. As a proven solution for more than 20 years, water companies and other installers can be confident in its performance.
- includes a fully integrated range of pipe and approved dedicated fittings.
- may be used for trenchless installations or subjected to cold bending.

SAFE, EFFECTIVE AND PROVEN TO PROTECT

Protecta-Line's double bonded five-layer construction consists of an internal standard PE host pipe (PE80 or PE100 conforming to BS EN 12201) for carrying water, an impermeable aluminium barrier layer to stop the ingress of contaminants, an outer polyethylene protection layer and two adhesive tie-layers.

THIS MEANS... Protecta-Line (Kitemarked to BS 8588) is impervious to contaminants in the soil which means no soil samples or excavation of contaminated soil to landfill are required, delivering lower installation costs.





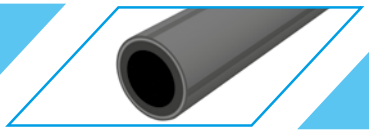
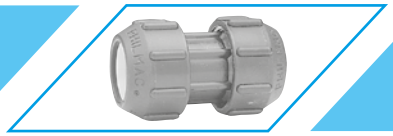
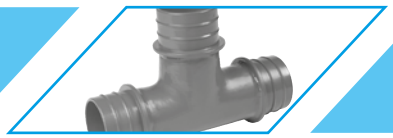
PRODUCT RANGE OVERVIEW



Protecta-Line Pipe is designed to safely transport drinking water in contaminated land. The approved pipe range is from 25mm to 630mm diameter with working pressures up to 16 bar.

It is a complete, approved system, used with confidence by installers for more than 20 years.

Over the following pages you can see the full range of pipe and fittings available.

		DESCRIPTION
PROTECTA-LINE PIPE		PE barrier pipe for water distribution through contaminated land
PROTECTA-LINE 3^{C} & 3^{CTH} COILS		Clean, capped and coiled PE barrier pipe for installation without pre-chlorination
MECHANICAL COMPRESSION FITTINGS		Mechanical compression fittings for service connections
FERRULE OFF-TAKES		Ferrules for live off-takes with minimal flow restrictions
MECHANICAL FITTINGS		Mechanical compression fittings for mechanical jointing without the need for pipe preparation or welding
ELECTROFUSION FITTINGS		Electrofusion fittings with a bar coding system for rapid and convenient jointing
PUPPED FITTINGS		Extended spigots suitable for electrofusion and butt-fusion jointing



STANDARDS/APPROVAL	MATERIAL	SIZE RANGE
BS 8588 WIS 4-32-19 Regulation 31/33 WRAS BS EN 12201 (core pipes)	Polyethylene Aluminium	25mm – 630mm (SDR11) 90mm – 630mm (SDR17)
BS 8588 WIS 4-32-19 Regulation 31/33 WRAS BS EN 12201 (core pipes)	Polyethylene Aluminium	90mm – 180mm
BS 8588 WIS 4-32-19 WRAS	Acetal	25mm – 63mm
BS 8588 WIS 4-32-19 WRAS	Gunmetal Acetal Stainless steel	25mm & 32mm (for 63mm – 355mm mains) 63mm (for 90mm - 355mm mains)
BS 8588 WIS 4-32-19 WRAS	Stainless steel Rilsan coated steel	63mm – 180mm
BS 8588* WIS 4-32-19* WRAS	Polyethylene	90mm – 630mm
WRAS (pipes and spigots)	Polyethylene	90mm – 630mm

*90mm - 355mm electrofusion fittings are Kitemarked

FITTINGS



MECHANICAL COMPRESSION FITTINGS

For 25mm to 63mm Protecta-Line



BENEFITS

- Proven barrier protection against contamination
- No contact between the pipe's protective aluminium layer and drinking water
- No risk of joint corrosion
- Easy and rapid all weather installation

FERRULE OFF-TAKES

For 63mm to 355mm Protecta-Line



BENEFITS

- No disruption to water supply
- Secure isolation of drinking water from ground contaminants
- Simple, all-weather installation with no scrapping or pipe preparation required
- Excellent headloss and flow characteristics
- Proven mechanical compression connections
- Innovative self-locking thimble design



MECHANICAL FITTINGS

For 63mm to 180mm Protecta-Line



BENEFITS

- Fast and easy all-weather jointing by a single installer
- No need for elastomeric seals, pipe-end preparation or welding.
- Only a torque wrench with an Allen (hex) bit socket is required
- No need for specialist tooling (eg. hydraulic pump) or external power supply – reduced health & safety risk
- Can be installed in the tightest of spaces

ELECTROFUSION FITTINGS

Electrofusion fittings for Protecta-Line



BENEFITS

- Easy and rapid installation
- Can be carried out in a trench, especially useful for repairs or tie-ins
- Proven barrier protection against contamination
- No risk of joint corrosion
- No contact between the pipe's protective aluminium layer and drinking water

PUPPED FITTINGS

Prefabricated fittings for Protecta-Line



BENEFITS

- Bespoke fabrications can be made
- Full barrier performance
- Flexibility to construct a pipeline to individual project needs
- Fully homogeneous pipeline (with fused joints)

CASE STUDIES



WIXAMS DEVELOPMENT

CHALLENGE

One of the largest developments created in the UK since World War 2 will house 4,500 families and include homes, amenities and educational facilities. The site was previously used as a munitions works and Anglian Water identified elevated levels of ground contamination.

Due to potential risks of water contamination, Anglian Water stipulated that barrier pipe must be installed for the water mains.



SOLUTION

Anglian Water has turned to us for help. As a result, more than 4km of Protecta-Line barrier pipe is being installed by Anglian Water's approved contractors, Achiva Limited, to cater for all of the water distribution needs for the development.

More than 3km of a mix of larger diameter 450mm and 355mm Protecta-Line has been installed through the spine of the development, with smaller spurs of 225mm and 180mm coming off into the housing estates, before dropping down to 90mm as it goes into the cul-de-sacs to supply each individual property.

Currently all open field land, there was no space or logistic restrictions with the installation, which has allowed the pipeline to be installed using an open cut installation and butt fusion jointing technique, which offered a quick and simple installation process.

Commenting on the scheme, Simon Pink, Project Engineer at Anglian Water, said: "We have used Protecta-Line successfully on other schemes, so we knew that it would provide a reliable and safe solution for Wixams. **The pipe system was much easier to handle on site, compared with ductile iron, and offered us a much quicker and simpler installation process.**"



PEMBROKE REFINERY

CHALLENGE

As with all industrial chemical sites, Valero's Pembroke Refinery faced the risk of soil contamination, which had health and safety implications for the supply of drinking water to the facility. In addition, many of the original metallic pipes had deteriorated and become prone to leaks and bursts. The refinery needed to implement a water network renewal programme.

SOLUTION

The refinery selected Protecta-Line barrier pipe system to replace existing metallic pipes. In some areas of the site, putting a bypass in place was simply not viable, therefore, the project team opted to slipline some of the existing metallic pipes with Protecta-Line which proved to be an efficient and cost-effective solution that minimised operational disruption.

On these sections, 110mm Protecta-Line pipe was inserted into the existing, corroded six inch carbon steel pipe using a cable to pull the new pipe into position. A range of Protecta-Line fluid compression fittings were also installed to ensure the integrity of the contamination barrier, without the need for any special procedures, including couplers, elbows, tees and stub flanges.

Protecta-Line stop cocks and self-tapping ferrule off-takes were also used, which enabled live off-takes of Protecta-Line service connections without any flow restrictions. **Alongside the need to renew the infrastructure, there was a clear focus on upgrading the pipeline to ensure it met the current regulatory requirements; fully WRAS and Regulation 31 approved for supply of drinking water, Protecta-Line was the ideal solution.**

MORRISONS BRIDGEWATER

CHALLENGE

This 75,000 square metre distribution centre serves the supermarket chain's network of stores in the South West and forms part of an £11 million regeneration scheme, including up to 2,000 new homes. The development is located on a mixed brownfield and greenfield site, which combines redundant industrial land with farmland.

The mains connection for the scheme is at the front of the site where there is a railway line and a chemical factory. Bob Wood from Wessex Water explained: "While stringent controls limit the contaminants from the factory now, historically they have been varied and significant. Trial holes across the site were tested for contamination and, while contaminants were not found over a large proportion of the site, the high water table did present the risk of migration of contaminants across a wider area."

SOLUTION

It was these concerns over the potential for contaminants to be carried to 'safe' soil areas by tidal waters on the flood plain site that prompted Wessex Water to specify 355mm Protecta-Line pipe system for a new main running across the distribution centre site, including the footprint of the building and access roads.

Around 1,200m of Protecta-Line was used in SDR17, providing up to 10 bar pressure capability which allows for additional capacity to be factored into the installation.

Wessex Water installed the pipe into open trenches, incorporating T-joints to allow take-offs of supply to be added at a future date. All joints were made by butt-fusion and the installation team prepared the pipes using the Protecta-Line Surprep tool to scrape away the outer layers. Wessex Water continued its practice of wrapping the joints using aluminium foil and Denso tape throughout the Protecta-Line installation.

Away from the Protecta-Line spine main, the site is not at risk of contamination so ordinary PE pipe was used with steel mechanical fittings to create the joints between the two materials. Bob adds: "**Even a small risk of contaminant migration makes it prudent to specify an effective barrier pipe. Protecta-Line safeguards against ingress of all known contaminants and is our preferred barrier pipe solution so this specification means that we can be confident of a safe water supply.**"

ADDED VALUE SERVICES



SPECIFICATION & DESIGN ADVICE



Our experienced pipeline engineers offer specification guidance and material estimates, and provide advice and recommendations during the design stage of a new pipeline scheme to ensure the most appropriate system is designed for each individual application.



CUSTOMER SERVICES

We pride ourselves on the high level of customer service we provide to each and every customer. Our Customer Service team offers support at every stage of a project, advising on lead-times, logistics and delivery requirements, managing the supply chain process from the point of order through to installation.

TECHNICAL SUPPORT



Providing assistance to the entire customer supply chain, our experienced technical support team offer product training, jointing demonstrations and installation advice to support the successful completion of every project.

ALL YOU NEED TO KNOW ABOUT HEALTH, SAFETY, QUALITY & ENVIRONMENT

STANDARD/APPROVAL	TITLE	APPLICABLE TO GPS PRODUCTS
Regulation 31/33	The Water Supply (Water Quality) Regulations (England/Wales/Scotland/NI)	All drinking water pipes
The (Water) Regulators Specification & The Water Supply (Water Fittings) Regulations 1999	The (Water) Regulators Specification & The Water Supply (Water Fittings) Regulations 1999	All pipe materials. All fitting materials. All PE100 fittings and matching pipes. All Protecta-Line fittings and matching Protecta-Line pipes
BS EN 12201	Plastics piping systems water supply, and for drainage and sewerage under pressure – Polyethylene (PE)	Blue and black PE80 and PE100 pipes and fittings in sizes up to 1200mm
WIS 4-32-19	Polyethylene pressure pipe systems with an aluminium barrier layer for potable water supply in contaminated land sizes	25mm to 630mm – Protecta-Line pipe and fittings
BS 8588	Polyethylene pressure pipe with an aluminium barrier layer and associated fittings for potable water supply in contaminated land	25mm to 630mm - Protecta-Line pipe and fittings
WIS 4-32-08	Specification for the fusion jointing of polyethylene pressure pipeline systems using PE80 and PE100 materials	Butt fusion and electrofusion jointing of blue and black PE80 and PE100 pipes and fittings
BS 6920 Part 1	Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on water – Part 1: Specification	All pipe materials. All fitting materials. All PE100 fittings and matching pipes. All Protecta-Line fittings and matching Protecta-Line pipes All pipe materials. All fitting materials.
BS 6920 Part 2	Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on water – Part 2: Methods of test	All PE100 fittings and matching pipes. All Protecta-Line fittings and matching Protecta-Line pipes. All pipes
BS 6920 Part 4	Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on water – Part 4: Method for the GCMS identification of water leachable organic substances	All pipes
ISO 4427	PE pipes for water supply	Blue and black PE80 and PE100 pipes and fittings
BS EN 15494	Specifications for polyethylene components and systems	Blue and black PE80 and PE100 pipes and fittings up to 1200mm
BS EN 805	Water supply – requirements for systems and components outside buildings	External water supply installations
BS 5306 – Part 2	Fire extinguishing installations and equipment on premises	Blue and black PE80 and PE100 for external buried fire mains
WIS 4-22-02	Specification for ferrules and ferrule straps for underground use	Protecta-Line ferrules
WIS 4-24-01	Specification for mechanical fittings and joints including flanges for polyethylene pipes for the conveyance of cold potable water for the size range 90 to 1000mm including those made of metal or plastics or a combination of both	Stub flanges, SlimFlange and Protecta-Line Mechanical Fittings

ENVIRONMENT

GPS operates an environmental management system in accordance with the requirements of BS EN ISO 14001. The system is audited twice a year by the BSI.

GPS continually monitors its business activities with the aim of minimising their impact on the environment. A number of on-going waste minimisation projects have been implemented in areas such as energy usage, product packaging and landfill waste.

A continual improvement culture is promoted within the company by setting environmental targets and objectives that are regularly monitored and reviewed.



WWW.GPSUK.COM

TEL: +44 (0)1480 442600
FAX: +44 (0)1480 458829
E: customerservice@gpsuk.com
ADDRESS: St Peter's Road, Huntingdon, PE29 7DA
GPS_PE_Pipes

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