

Hangar 4, Manchester Airport

Remediation Strategy





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Remediation Strategy

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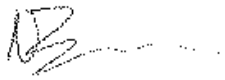
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B041631-TTE-XX-XX-DR-C-0601-T02 - Cut & Fill

B041631-TTE-00-XX-DR-U (Site Location Plan)

B041631-TTE-00-XX-DR-U-0002-P01 (Site Boundary Plan)

B041631-TTE-00-XX-DR-U-0003-P02 (Exploratory Hole Location Plan)

THIRD PARTY DRAWINGS

020993-RPS-SI-00-DR-A-0500-P07-Site Layout

APPENDICES

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
aOD	above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, Food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desk Top Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit Of Detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OS	Ordnance Survey
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Poly Chlorinated Biphenyl
PPE	Personal Protective Equipment
ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbons
TSV	Tier 1 Screening Values
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech Ltd (Tetra Tech) was commissioned by Threadneedle Curtis Limited (The Client) to design and produce a remediation strategy for the proposed redevelopment of Hangar 4, to be replaced with a distribution centre, an external service yard and car parking in the surrounding areas.

The location of the wider site is shown on Drawings B041631-TTE-00-XX-DR-U-0001 Site Location Plan and is shown by Drawing B041631-TTE-00-XX-DR-U-002 – Site Boundary Plan.

1.2 BRIEF

This document sets out the general strategy for the proposed remediation and summarises how the works are to be implemented. The remediation strategy has been developed in line with the findings of ground investigation works completed at the site in 2023 by Tetra Tech.

1.3 TERMINOLOGY

The following terminology has been used within this document in relation to levels:

- Final Development Level (FDL) = the finished floor level (FFL) within buildings and the ground level following the construction of roads / hardstanding / soft landscaping.
- Formation Level = the indicative formation depths below FDL (note these may be subject to change at detailed design stage and may incorporate piling mats):
 - 535mm – Car park area;
 - 350mm – Internal and external slabs
 - 265mm – Footways and landscaping
- Original Ground Level = the ground level prior to commencement of construction works.

The Finished Floor Levels are detailed by drawing B041631-TTE-XX-XX-DR-C-0600 - Proposed Levels & Contours and the Formation Levels are detailed on drawing B041631-TTE-XX-XX-DR-C-0601 - Cut & Fill.

1.4 PROPOSED DEVELOPMENT

The proposed end-use for the site is as a 92,000ft² distribution centre with an external service yard and car parking in the surrounding areas. The proposed development is shown in Third Party Drawings as 020993-RPS-SI-00-DR-A-0500-P07-Site Layout.

1.5 REMEDIATION STRATEGY OBJECTIVES

This Remediation Strategy summarises the principles, strategy and general method of approach to the proposed remediation works. This strategy takes into account the currently anticipated redevelopment of the site to one of predominantly commercial end use.

The document is intended for submission to the Local Planning Authority along with the ground investigation report. It is therefore intended this document will be agreed with Tameside Metropolitan Borough Council. The enabling and development works will be undertaken in accordance with and validated against this agreed strategy. Tetra Tech has produced a civil engineering specification, B041631-TTE-XX-XX-SP-C-0001 December 2023, which includes the design of cut and fill earthworks to be undertaken by the contractor.

The site will be remediated adopting UK industry best practice and legislation with consideration for its intended end-use, taking into account the identified environmental receptors and human health with regard to the general

setting of the site. This approach will consider practical aspects such as excavation limitations relating to depth, structural constraints, boundary matters, digging near utilities, health & safety matters, cost-benefit analysis etc.

The remediation strategy includes the following:

- Summary of pollutant linkages and risks
- Options appraisal for methods to address the risks
- Likely preferred remedial options
- Verification plan including laboratory testing
- Chemical criteria for re-use and import chemical criteria if required
- Any further ground investigation required during remediation works
- Dealing with unforeseen contamination if encountered during remediation works
- Cover layers in gardens and landscaping including chemical criteria
- Protection of future drinking water pipes
- Consideration of ground gas
- Environmental protection measures during remediation works

The strategy has been designed to practically minimise the risks to receptors whilst also being a strategy emphasizing a sustainable and cost beneficial approach. The strategy is therefore one of environmental risk reduction which seeks to reduce the impact on receptors by source treatment and removal and/or by the breaking of contaminant linkages by the breaking of pathways for contamination.

Any proposed variations to this Remediation Strategy which may derive from ground conditions encountered during the works, will be discussed with Tameside Metropolitan Borough Council prior to implementation.

2.0 SITE INFORMATION

2.1 SITE DETAILS

A description of the site and the main findings of the previous environmental assessments are provided below. Tetra Tech has prepared the following geo-environmental reports relating to the site:

- B041631.DS.1 - Hangar 4, Manchester Airport Desk Study dated February 2023.
- B041631.FR.1 - Hangar 4, Manchester Airport Factual Report dated May 2023
- B041631.GIR.2 - Hangar 4, Manchester Airport Ground Investigation Report dated July 2023.

2.2 LOCATION

The site is located between Wilmslow Old Road, Avro Way and Pinfold Lane within the Manchester Airport complex. The site is approximately 2.10 hectares in area and is centered upon National Grid Reference (NGR) SJ 81121 84640.

A site location plan is presented in Drawing No. B041631-TTE-00-XX-DR-U-0001.

2.3 SITE DESCRIPTION

A site walkover inspection undertaken by Tetra Tech in December 2022 recorded that the site was occupied by an old airport hangar which had been repurposed as a vehicle/equipment storage facility. Above ground Diesel tanks, a gas bottle compound and single storey ancillary buildings were located to the northeast of the main building.

The onsite structures have since been demolished to slab level.

2.3.1 Former Uses and Site History

Historical maps show the site as comprising agricultural land from 1872 to 1938 with an aircraft hangar recorded from 1946 up until 1976 when it is referred to as Manchester Airport. An unspecified mound was recorded on the western boundary from 1954 to 1987 and is not present today.

2.4 PUBLISHED GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

2.4.1 Geology

The published geological map Sheet 98 for Stockport dated 1977 and BGS GeoIndex mapping indicates that the site is entirely underlain by Devensian Glacial Till (Diamicton). Till is described by the BGS as “unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (diamicton)”.

The superficial deposits are indicated to be underlain by the Bollin Mudstone Member. The BGS describe the mudstone as “the upper part is a dominantly laminated reddish-brown and greenish-grey mudstone with siltstones. The lower part is a structureless and laminated, dominantly reddish-brown mudstone. Within the lower part of the member, a unit termed the 'Lower Keuper Sandstone' has been recognised in the Stockport area”.

2.4.2 Hydrogeology

The superficial deposits are classified as a Secondary Undifferentiated Aquifer and the bedrock is classified as a Secondary B aquifer which is described as “Predominantly lower permeability layers which may store/yield

limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.” The site is not located within a Source Protection Zone (SPZ) and there are no groundwater abstractions recorded within 500m of site.

2.4.3 Hydrology

The Desk Study report indicates that the nearest surface watercourse is Cotterill Clough Brook 48m south of the proposed development and is considered to be part of the wider rivers system Bollin (River Dean to Ashley Mill).

Based on the general topography it is considered that the site will drain to the south toward Cotterill Clough Brook which flows away to the south.

The Environment Agency indicate that Bollin (River Dean to Ashley Mill) had an Ecological Quality of ‘moderate’ in 2019 and a chemical quality listed as ‘fail’.

There are no active surface water abstraction licences within 1km of the site.

There are two active discharge license consents within 500m of the site, with the closest related to Manchester Airport 42m south described as surface water site drainage.

There are no records of pollution incidents within 500m of the site.

2.5 MINING HISTORY

2.5.1 Coal Mining

The site is not located within a Coal Mining Reporting Area.

2.5.2 Non Coal Mining

No mineral or resource mining is recorded as having taken place onsite with the only ground workings recorded as a sewage treatment works just beyond the southern boundary.

2.6 POTENTIAL ASBESTOS WITHIN BUILDINGS

An asbestos report has been provided for Hangar 4, which noted that ACMs were present in the hangar. Galbestos was described as present on external walls, and galbestos sheeting present on the ground floor. Felt was present behind metal cladding on external doors, behind galbestos on external walls, and on high level metal panels on the ground floor. (Airborne Environmental Consultants Ltd. Dec 2017).

Hangar 4 has since been demolished. Hazardous Waste Removal Records were provided to Tetra Tech by R&M Developments which detail that the asbestos containing materials were removed by an asbestos specialist, Anglo Asbestos Ltd.

3.0 CONTAMINATION DATA REVIEW

This remediation strategy has been informed by the Tetra Tech Ground Investigation Report B041631.GIR.2 dated July 2023.

This section summarises the findings of the ground investigation works.

The exploratory hole locations are shown on Drawing No B041631-TTE-00-XX-DR-U-0003 Exploratory Hole Location Plan.

3.1 SCOPE OF WORKS

The ground investigation undertaken by Tetra Tech in 2023 comprised the following:

- Three Cable Percussion boreholes including geo-environmental sampling and insitu testing to a maximum depth of 11.00m below ground level (m bgl);
- Two rotary boreholes with dynamic sampling and rotary coring to a maximum depth 15.80m bgl;
- Five window sample boreholes including geo-environmental sampling and insitu testing to a maximum depth of 4.38m bgl;
- One day of dynamic probing to inform pavement design;
- Installation of five 50mm dia. Ground gas and groundwater monitoring wells;
- On-site inspection and logging of recovered samples;
- Representative soil sampling for geotechnical laboratory classification testing;
- Representative soil and groundwater sampling for chemical laboratory analyses; and
- Four return visits to monitor ground gas composition and groundwater levels.

3.2 ENCOUNTERED STRATA

The encountered strata are summarised below and described in detail in the following report:

- B041631.GIR.2 – Hanger 4, Manchester Airport Ground Investigation Report dated July 2023.

3.2.1 Made Ground

Made Ground was recorded across the site with local variation in composition and thickness likely associated with the historical land use. The Made Ground encountered is described below.

Hardstanding

Black bituminous macadam was encountered at CP01, CP02, DS01, DS02 and DS03 to a maximum recorded depth of 0.20m bgl. Reinforced concrete was encountered at CP03, CP04, CP05, DS04 and DS05 to a maximum recorded depth of 0.42m bgl.

Made Ground

Underlying the hardstanding was a layer of both whole laid bricks and randomly assorted bricks to a maximum depth of 0.70m bgl encountered at CP01, CP02, CP03, CP04, CP05, DS04 and DS05.

Locally underlying the hardstanding at CP02, CP04, DS02, DS03, DS05 was a gravelly sand up to 1.20m thick to a maximum depth of 1.50m bgl.

A clay, interpreted as fill, was recorded across site up to 2.70m thick and consisted of soft to firm reddish grey and brown very gravelly clay to a maximum recorded depth of 3.10m bgl.

3.2.2 Superficial Deposits

Superficial deposits were encountered across the site from 0.85m bgl to a maximum depth of 9.58m bgl. They were typically sand from 1.28m bgl to maximum depth of 9.58m bgl.

In CP04 and CP05, clay was encountered from 0.85m bgl to 6.00m bgl and recovered as firm to stiff gravelly sandy CLAY.

Sand and gravel was recorded between 6.00m bgl and 9.58m bgl in CP04 and CP05. This stratum was noted as overlying the bedrock strata.

3.2.3 Weathered Bedrock

Weathered bedrock was encountered in CP01, CP02, and DS05 from 3.40m bgl to 5.20m bgl. This was recovered as reddish brown clayey gravelly sand.

3.2.4 Bedrock

Bedrock was cored at two locations (CP04, CP05), from 8.00m bgl to 15.80m bgl. The rock was described as medium strong reddish-brown mudstone with veins of gypsum..

3.2.5 Groundwater

Groundwater wasn't observed as part of the borehole drilling due the requirement for water to ease the drilling process.

Table 3.1 is a summary of groundwater level monitoring of installations by Tetra Tech in 2023.

Table 3-1 – Summary of 2023 Groundwater Level Monitoring

Exploratory Hole (investigation)	Shallowest recorded Water Depth (m bgl)	Shallowest recorded Water Depth (m AOD)	Deepest recorded Water Depth (m bgl)	Deepest recorded Water Depth (m AOD)	Depth to Base of Standpipe (m bgl / m AOD)	Notes
DS01	0.96	67.71	1.06	67.61	2.02 / 66.65	
DS02	0.70	67.29	0.79	67.20	1.97 / 66.02	
DS03	0.31	66.87	0.53	66.65	2.00 / 65.18	
DS04	1.70	66.30	2.00	66.00	2.88 / 65.12	
DS05	2.80	64.55	2.85	64.50	3.76 / 63.59	Visit 1 is not included as the well was flooded by surface water and required bailing.

3.2.6 Visual and Olfactory Evidence of Contamination

No visual and olfactory evidence of contamination was identified during the site works.

3.2.7 Identified Soil Contamination

The Tetra Tech Ground Investigation Report, B041631.GIR.2 dated July 2023, assessed the chemical analysis data for metals, TPH, PAH and asbestos as well as VOC and SVOC testing against Generic Assessment Criteria (GAC) for commercial land use utilising a conservative Soil Organic Matter (SOM) of 1%. The assessment did not identify any exceedances of the GAC. The report acknowledges the potential for contamination to be present in untested areas of the site.

3.2.8 Asbestos

Asbestos screening of soils was undertaken as part 2023 ground investigation. No asbestos was detected.

Asbestos that was part of the fabric of the now demolished building was removed prior to demolition. Given the historical land use there is potential for asbestos in soils to be present in untested areas of the site.

3.2.9 Gas monitoring

Gas monitoring was undertaken by Tetra Tech as part of the 2023 investigation and categorized the site as CS 1 inline with CIRIA C665 guidance. As such, gas protection measures are not considered to be required for the site.

3.2.10 Conceptual Site Model and Contamination Risk Assessment

A conceptual site model and contamination risk assessment is included in the B041631.GIR.2 - Hanger 4, Manchester Airport Ground Investigation Report dated July 2023. The key receptors being addressed by each remedial measure are given in Section 4.1 of this strategy.

4.0 REMEDIATION STRATEGY

4.1 SCOPE OF CONTAMINATION REMEDIATION WORKS

The proposed remediation and risks being addressed are summarised as follows:

Enabling Works Remediation

- During earthworks, visual assessment and testing of any soils visibly impacted by hydrocarbons or asbestos containing material to establish if they exceed the Remediation Criteria in Appendix B. To protect human health of future end users, construction workers and the environment.
- Excavation of hotspots (if identified during the construction phase) and verification testing in accordance with the verification plan in this strategy.
- All monitoring boreholes can be removed as part of the earthworks.

Development Works Remediation

- Use of suitable pipe along drinking water supply routes following testing of soils in line with current guidance. To protect human health of future end users.

4.2 REMEDIATION CRITERIA, PUBLIC OPEN SPACE CRITERIA AND DEVELOPMENT / IMPORT CRITERIA

The main driver for the remediation is the protection of human health. Remediation Criteria are listed in Appendix B. Verification protocol are described in Section 4.4 and are summarised in Section 5.0.

4.2.1 Remediation Criteria

Soils visually contaminated by hydrocarbons or asbestos containing material shall be assessed against the Remediation Criteria. Soils which exceed the criteria shall be remediated prior to re-use on site or disposed of from site to an appropriately licensed landfill or treatment facility.

4.2.2 Development Criteria

The Development Criteria will be used during the works:

- To confirm the suitability of topsoil/ subsoil (with respect to contamination only) imported for use in soft landscaped areas.

4.3 REMEDIATION OPTIONS

Assessment of chemical analysis data from the ground investigation did not identify any contaminant linkages requiring remediation. Therefore, remediation, if required, will relate to potential areas of unidentified contamination e.g. visual evidence of hydrocarbons or asbestos containing material.

The objectives of the remedial options considered in Table 4.1 are as follows:

1. Provide a site suitable for development for a commercial end use with respect to human health risks from potential ground contamination.
2. Minimise the impact of the remediation works on the surrounding environment.
3. Provide a sustainable and economically viable remediation solution.

4. Optimise the asset value of the site.

Table 4.1 – Ex Situ Remediation Options Screening

Technology	Achieve Objectives (Section 4.3)				Comments
	1	2	3	4	
Off Site Disposal	✓	x	x	✓	a) Minimal risk of residual contamination posing risk to human health, and validation and compliance easily achieved. b) Not environmentally sustainable due to transport and use of a landfill. c) Expensive.
Cover layer	✓	✓	✓	✓	a) Sustainable solution for reducing human health risks especially if the cover material can be site won. b) Can be costly if much of the cover layer is required to be imported. c) Can result in developer needing to change site levels which may result in surplus material.
Hand picking of visible asbestos fragments in soils	✓	✓	✓	✓	a) No asbestos containing material identified in soils to date. b) Sustainable solution as results in minimal off site disposal. c) Protective of human health of end users and construction workers subsequently excavating through the Made Ground e.g. for drainage.
Excavation and bioremediation of hydrocarbon contamination	✓	✓	✓	✓	a) No hydrocarbon contamination requiring remediation identified on site to date. b) Any hotspots which may be identified in the future are likely to be localized and straightforward to remediate to below the Remediation Criteria by bioremediation. c) Sustainable – avoiding disposal to landfill.

It is anticipated that if soils containing fragments of asbestos containing material are encountered these will be remediated by hand picking of the fragments or off site disposal of the material if fragments are too numerous/small to effectively remove by hand picking.

If soils exhibiting visual or olfactory evidence of hydrocarbon contamination are encountered it is anticipated these will be remediated by bioremediation or off site disposal to a landfill or soil treatment facility.

4.4 REMEDIATION OF SOILS

4.4.1 Remediation Criteria Exceedances Requiring Treatment - Hydrocarbons

To date no areas of visual or olfactory hydrocarbon contamination of soils have been identified that require remediation. There is potential that during the earthworks significant hydrocarbon visual or olfactory evidence of hydrocarbon contamination may be encountered. If this occurs, the material shall be assessed against the Remediation Criteria.

Soils which are confirmed to exceed the Remediation Criteria will be excavated. The excavation will have lateral dimensions of a minimum of either 1m by 1m or the extent of hydrocarbon impacted material identified, whichever is the greater. The depth of the excavation will be a minimum of 2.0m below Formation Level or to the base of hydrocarbon impacted material, whichever is the shallower. Soil samples will be taken at a rate of 1 per 100m² from the base (a minimum of one sample from the excavation base) and 1 per 20m² from the sides of the excavation (a minimum of four samples from the sides) and excavation terminated when all sample concentrations are below the TPH Remediation Criterion.

The excavated material will be treated on site as appropriate prior to re-use or individually stockpiled prior to off-site disposal. Consideration should be given to use of a soil treatment centre for off-site disposal.

Onsite treatment of stockpiled material prior off-site disposal in order to reduce its waste disposal classification from hazardous to non-hazardous may be undertaken if required.

4.4.2 Remediation Criteria Exceedances Requiring Treatment - Asbestos

To date no fragments of asbestos containing material have been identified in soils and therefore remediation is not required. There is potential that during earthworks fragments of asbestos containing material will be encountered in soils. If this occurs, the material shall be assessed against the Remediation Criteria.

If suspected fragments of asbestos containing material are encountered the area shall be fenced off and samples taken of both the potentially impacted soil and the potential asbestos containing material to confirm if there is a presence of asbestos.

Where asbestos is confirmed as being present the area shall be handpicked and the recovered asbestos containing material appropriately stored prior to its disposal from site at a suitably licenced facility. If it is not practical to undertake hand picking the area shall be subject to targeted excavation and the excavated soils suitably stored prior to their disposal to a suitably licensed facility (likely as hazardous waste).

Verification following hand picking: A record by an appropriately qualified person that no fragments of asbestos containing material remain. This shall include photographs of the material pre and post hand picking to demonstrate effective remediation. A written record of the verification shall be produced. The residual soils following hand picking can be reused providing they meet the Remediation Criteria.

Verification following targeted excavation: The excavation will have lateral dimensions of a minimum of either 1m by 1m or the extent of asbestos containing material identified, whichever is the greater. The depth of the excavation will be dictated by absence of fragments of asbestos containing material. A record by an appropriately qualified person that no fragments of asbestos containing material remain within the excavation. This shall include photographs of the material pre and post hand picking to demonstrate effective remediation. A written record of the verification shall be produced.

Overburden material not containing fragments of asbestos containing material can be separated for reuse.

4.4.3 Decommissioning Monitoring Standpipes

Monitoring wells installed as part of ground investigation can be excavated during earthworks. No specific decommissioning of monitoring wells is required as no significant risk from ground gas has been identified at the site. They do not pose a significant risk to groundwater as a pathway for migration of contaminants as the majority of the site will be covered by buildings and hardstanding and the aquifers associated with the superficial deposits and bedrock are of low environmental sensitivity.

4.4.4 Unexpected Contamination

In the event that unexpected contaminants are identified the following steps shall be undertaken:

- Initial characterization e.g. trial trench to assess the lateral and vertical extent of contamination with associated sampling. Laboratory testing required to be agreed with the Designer.
- Designer or Contractor (as appropriate) to notify Tameside Metropolitan Borough Council: nature of the contamination, thickness of impacted soil, approximate volume, chemical analysis being undertaken.
- Designer to consider if updates to the Remediation Strategy are required e.g. for contaminants not previously assessed as a risk.
- Consult with Tameside Metropolitan Borough Council to agree proposed update to the Remediation Strategy.
- Proceed with remediation in accordance with the Remediation Strategy (existing version or updated version as appropriate).

There is potential that visual evidence of asbestos containing material and hydrocarbon contaminants will be encountered in currently unidentified locations. The remediation process described above will be followed for such areas so that the requirements of this strategy are met. Such contamination is not considered to be 'unexpected contamination'.

4.4.5 Water Utilities

Based on the findings of the ground investigation, water pipes installed within Made Ground will need to be constructed from barrier polyethylene or ductile iron as agreed with the utility provider. Once service routes are determined, targeted site investigation and testing along the route could be undertaken to establish whether lower grade pipework could be utilised. Testing should be undertaken in accordance with Water UK 2014, Contaminated Land Assessment Guidance.

Standard pipework can be used in areas of the site where natural strata have become exposed at final development level as a result of areas of earthworks cut (i.e. all Made Ground has been removed).

5.0 CONTAMINATION VERIFICATION SUMMARY

5.1 GENERAL

The Contractor will carry out sampling and testing to demonstrate that the remediation is complete.

Chemical verification testing will be undertaken with a maximum laboratory turnaround of seven working days. The Contractor will accurately record the position, depth and date of all verification samples obtained from stockpiles, excavations and surfaces by survey.

5.2 VERIFICATION REQUIREMENTS SUMMARY

Table 5.1 – Summary of Verification Testing Requirements

Remediation Requirement	Verification testing	Verification records
Hydrocarbon hotspots, if identified	Base of excavation one sample / 100m ² (min one sample), one sample /20m ² sides of excavation (minimum four samples).	Before and after photographs. Laboratory test results. Excavation location and dimensions
Asbestos hotspots, if identified	Visual inspection by appropriately qualified person	Before and after photographs. Written report
Unexpected contamination	To be confirmed if any unexpected contamination encountered	To be confirmed if any unexpected contamination encountered
Water utilities	None	Confirmation that suitable water pipes have been installed

5.3 VERIFICATION REPORTING

If contamination is encountered during the construction phase a verification report will be compiled. It is likely this will be prepared by the contractor, or by a designer if they have been involved in supervision of remediation work.

The verification report will provide details of the remediation works that were undertaken and include the information in Table 5.1. The objective of the verification report is to demonstrate that works associated with dealing with contamination issues were carried out in accordance with this Remediation Strategy.

6.0 WASTE AND MATERIALS MANAGEMENT

6.1 MATERIALS MANAGEMENT

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

The 'Definition of Waste' Code of Practice' (DoW CoP) provides a process which enables the reuse of excavated materials on-site or their movement between sites. Use of DoW COP supports the sustainable and cost effective development of land. It can provide an alternative to Environmental Permits. The process requires demonstration of suitability and certainty of use. A Materials Management Plan (MMP) summarises the evidence to support reuse of material. The scheme is administered by CL:AIRE and requires sign off by a Qualified Person as defined in the DoW CoP. Similarly, if soils other than primary aggregate or aggregates produced under the WRAP Protocol, are imported to site, a Materials Management Plan will be required.

The following factors are required to be demonstrated within a Materials Management Plan for each reuse scenario:

1. Protection of human health and protection of the environment.
2. Suitability for use, without further treatment.
3. Certainty of use.
4. Quantity of material.

A verification report will be required to demonstrate reuse of material took place in accordance with the materials management plan.

Further detail is provided in the Development Industry Code of Practice (CL:AIRE, 2011) and the associated Frequently Asked Questions on the CL:AIRE website.

6.2 SUITABILITY OF MATERIAL FOR REUSE

The chemical analysis data obtained to date indicates the material assessed is unlikely to pose a significant risk to human health within the context of the proposed commercial end use or to controlled waters receptors. For the proposed commercial development it is likely to be suitable for reuse from a chemical perspective without treatment.

Further assessment will be required if unidentified contamination is encountered during the construction phase.

Consideration of the geotechnical suitability of material for reuse is outside the scope of this report.

6.3 WASTE CLASSIFICATION FOR DISPOSAL TO LANDFILL

Waste classification is a two stage process with the first stage comprising a hazard assessment of the soil quality data in line with the guidance set up in the Environment Agency waste classification technical guidance WM3 document. This determines if waste is characterised as hazardous or non-hazardous. Once the hazardous properties of the materials are known, the second stage is to assess the potential performance of the materials in a landfill, undertaken by considering the results of waste acceptance criteria (WAC) testing.

A waste characterisation assessment is presented in the Tetra Tech report B041631.GIR.2 - Hanger 4, Manchester Airport Ground Investigation Report dated July 2023.

Ground investigation undertaken by Tetra Tech has not identified asbestos in soils. However, there is potential that asbestos containing material will be encountered in soils during the works. Asbestos can affect the waste classification of soils in two ways:

1. If the concentration of asbestos fibres is greater than 0.1% the soil is classified as hazardous waste.

2. If one or more pieces of asbestos containing material are present the soil is classified as hazardous waste.

At the time of writing it is not known if material will require disposal to landfill. The phases of ground investigation were not designed specifically for waste characterisation. It may not have included all soil types to be disposed to landfill from the proposed construction activity. Further sampling, laboratory analysis and waste classification may be required specific to material to be disposed to landfill if/when such material is identified.

6.4 WASTE ACCEPTANCE CRITERIA TESTING

Waste acceptance criteria (WAC) testing undertaken as part of the ground investigation is presented in the Tetra Tech report B041631.GIR.2 - Hanger 4, Manchester Airport Ground Investigation Report dated July 2023. Note in the event of proposed disposal of soils to landfill further testing may required specific to the soils to be disposed.

Non-hazardous waste can be disposed to a landfill that accepts non-hazardous waste without WAC testing. If considering disposal of non-hazardous material at an inert landfill a full WAC suite is required. If considering disposal of hazardous material at a hazardous landfill a hazardous WAC suite is required.

7.0 PRINCIPLES OF SITE SET UP AND ENVIRONMENTAL CONTROL

7.1 ENVIRONMENTAL CONTROLS DURING THE ENABLING WORKS.

7.1.1 General

Remediation operating procedures will be based around guidance contained within the HSE document entitled “Protection of Workers and the General Public During the Redevelopment of Contaminated Land” (HS(G)66) (no longer current but cited within Building Regulations for England and Wales). The Contractor will be required to provide a Waste Management Plan and provide information regarding their Environmental Management Systems.

The mitigation of any significant temporary impacts upon the overall local environment during remediation is an important consideration for this site.

Environmental considerations will be assessed and monitored with control measures put in place to limit the impacts from such. Emphasis will be placed on prevention and control at source rather than mitigation following release. Site operations will be conducted in order to reduce such environmental impacts to a practical minimum. Full details of and method statements for environmental control measures can be provided to the regulators if required once these have been received from the relevant contractor.

Environmental control measures will be carried out in accordance with C741 Environmental Good Practice on Site guide, 4th edition 2015 and will incorporate the following:

Table 6-1 – Environmental Control Measures During the Enabling Works

Feature	Monitoring and Control Measures
Contaminated run-off	All contaminated stockpiles will be located on impermeable surface or sheeting and surrounded by bunds. In the short term during the works run-off will be controlled through the use of temporary ditches and holding/ settling ponds. Such measures will also be incorporated to control run-off from un-remediated areas to remediated areas.
Dust, airborne fibres, litter, air emissions	Damping down, covering of exposed work faces, litter screens, noting wind direction. Dust monitoring and airborne fibre monitoring if/where asbestos is identified.
Odours	Regular walkovers on site boundaries to assess odours. Odour suppression or masking may be required.
Noise and vibration	Recommendations as detailed in BS5228. Use of appropriate construction techniques.

There is a watercourse to the south known as Cotterill Clough and as such is considered to be of a sensitive nature.

Working areas where contamination is being excavated or treated will be segregated from designated ‘clean’ areas to limit cross-contamination of remediated areas.

Any soils identified as failing the Remediation Criteria shall be stockpiled only on bunded areas of hardstanding or areas specifically prepared by the laying of heavy-duty plastic sheeting. Run off from these areas shall be collected and disposed of to the Contractor’s water treatment plant prior to disposal to sewer or disposed of from site by tanker. The bunds surrounding the stockpiles shall be of sufficient height and the stockpiling shall allow for sufficient space to remain such that contaminated run off does not escape the bunded areas even during periods of heavy or prolonged rainfall.

In order to manage risk to the public and workers the remediation site works will be carried out under an appropriately detailed health and safety plan pursuant to the CDM Regulations. Suitable PPE and RPE as required by site conditions will be identified in risk assessments and will be worn by site workers and visitors where appropriate. Visitors to site will be accompanied by a trained and competent person at all times.

During earthworks modified 'Frisbee' directional dust deposit gauges shall be installed around the site boundaries. Samples shall be collected by a UKAS accredited laboratory on a weekly basis and measured for volume (results reported as mg/m²/day). Acceptability levels should be agreed with the Local Authority prior to work commencing.

7.1.2 Transport of Soils

Any traffic entering or leaving the site to a landfill or reprocessing site or with imported material shall have records of vehicle registration, estimated net weight and destination.

Loading of vehicles will be performed in an organised manner so as to prevent the spread of contaminants. All loads leaving the site will be sheeted and vehicles cleaned if required prior to leaving site. The sheeting of these loads will be checked and recorded by the Contractor to check for appropriate and complete coverage of the load.

The sheeting will be of durable construction, undamaged, continuous and of sufficient size to completely cover the enclosed load. The sheeting will be tied down in an appropriate manner and with sufficient tension such that there will be no loss of material during transport.

7.1.3 Dewatering of Excavations During the Enabling Works

The Contractor will be responsible for the control of all surface water within the working area during the Works. Pumping / dewatering operations will be used as required in the works areas, stockpile areas and soil treatment areas.

The Contractor will ensure that potentially contaminated waters and leachate from the excavations, compacted areas or stockpiles do not reach watercourses, drains, rivers, etc and specifically the drainage ditch to the southeast. The Contractor will manage such contaminated waters so that they do not discharge onto ground external to the site.

Direct discharge of groundwater is not permitted into the public or private foul or surface water sewers or any other standing body of water without specific consent or approval. The Contractor will check that all necessary consents are in place.

Where practicable dewatering to enable excavation through standing water shall be undertaken as necessary in order to complete the contamination remediation and validation as detailed in Sections 4.0 and 5.0.

8.0 REFERENCES

BRE 2001, Protective measures for housing on gas-contaminated land.

CIRIA 2007, Assessing risks posed by hazardous ground gases to buildings, C665.

HSG66, Protection of workers and the general public during the development of contaminated land.

CIRIA 2015, Environmental good practice on site guide (fourth edition), C741.

CL:AIRE 2016, CAR-SOIL, Control of Asbestos Regulations 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, ISBN 978-1-905046-30-0

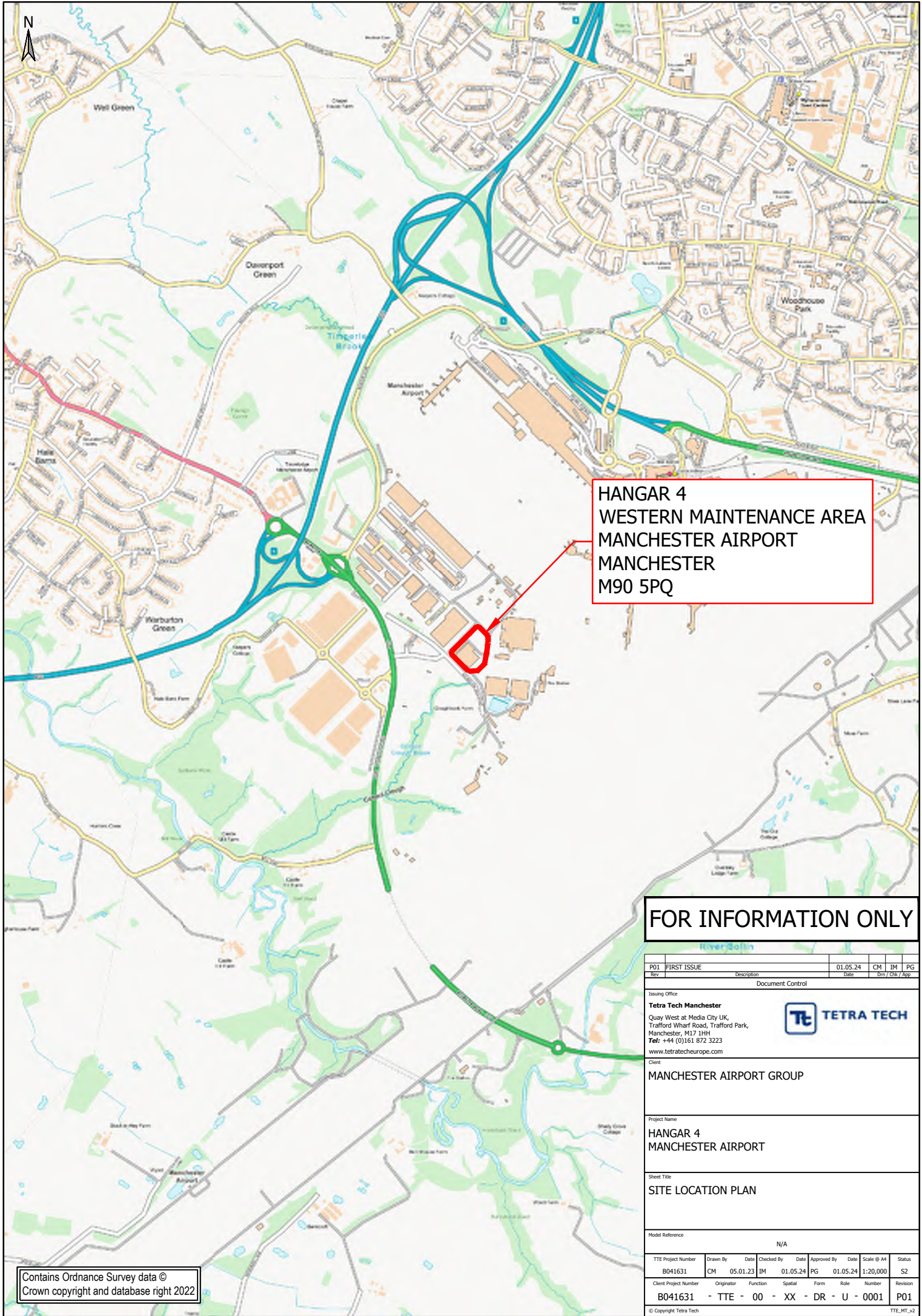
J100593 Refurbishment Survey Airborne Environmental Consultants Ltd. dated December 2017

B041631.DS.1 - Hangar 4, Manchester Airport Desk Study dated February 2023.

B041631.FR.1 - Hangar 4, Manchester Airport Factual Report dated May 2023

B041631.GIR.2 - Hangar 4, Manchester Airport Ground Investigation Report dated July 2023.

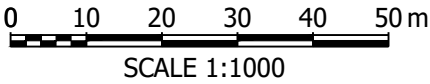
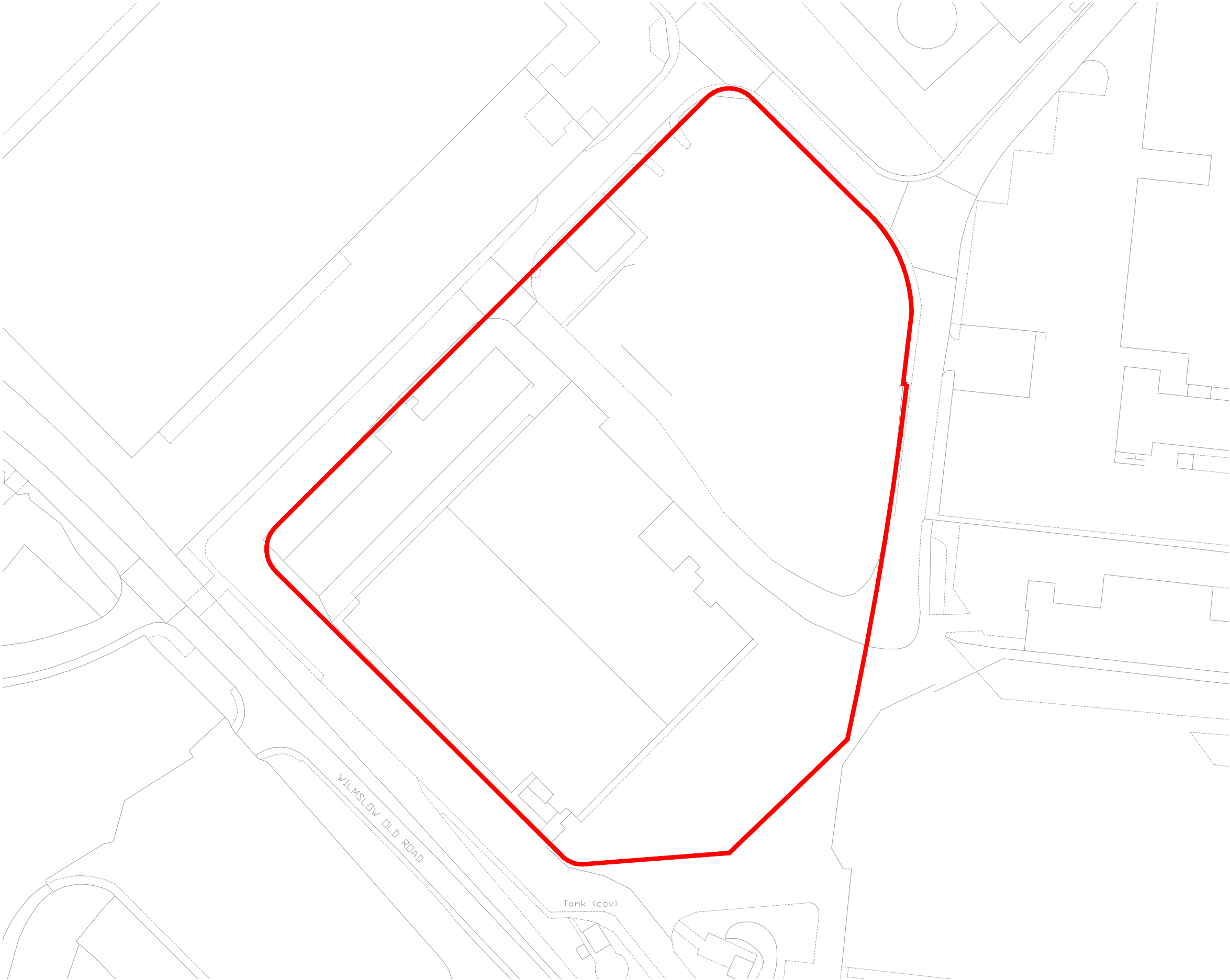
DRAWINGS



HANGAR 4
WESTERN MAINTENANCE AREA
MANCHESTER AIRPORT
MANCHESTER
M90 5PQ

FOR INFORMATION ONLY

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Project Name						
HANGAR 4 MANCHESTER AIRPORT						
Sheet Title						
SITE LOCATION PLAN						
Model Reference						
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B041631	- TTE	- 00	- XX	- DR	- U	- 0001
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KEY



SITE BOUNDARY

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P01	FIRST ISSUE	01.05.24	CM	IM	PG
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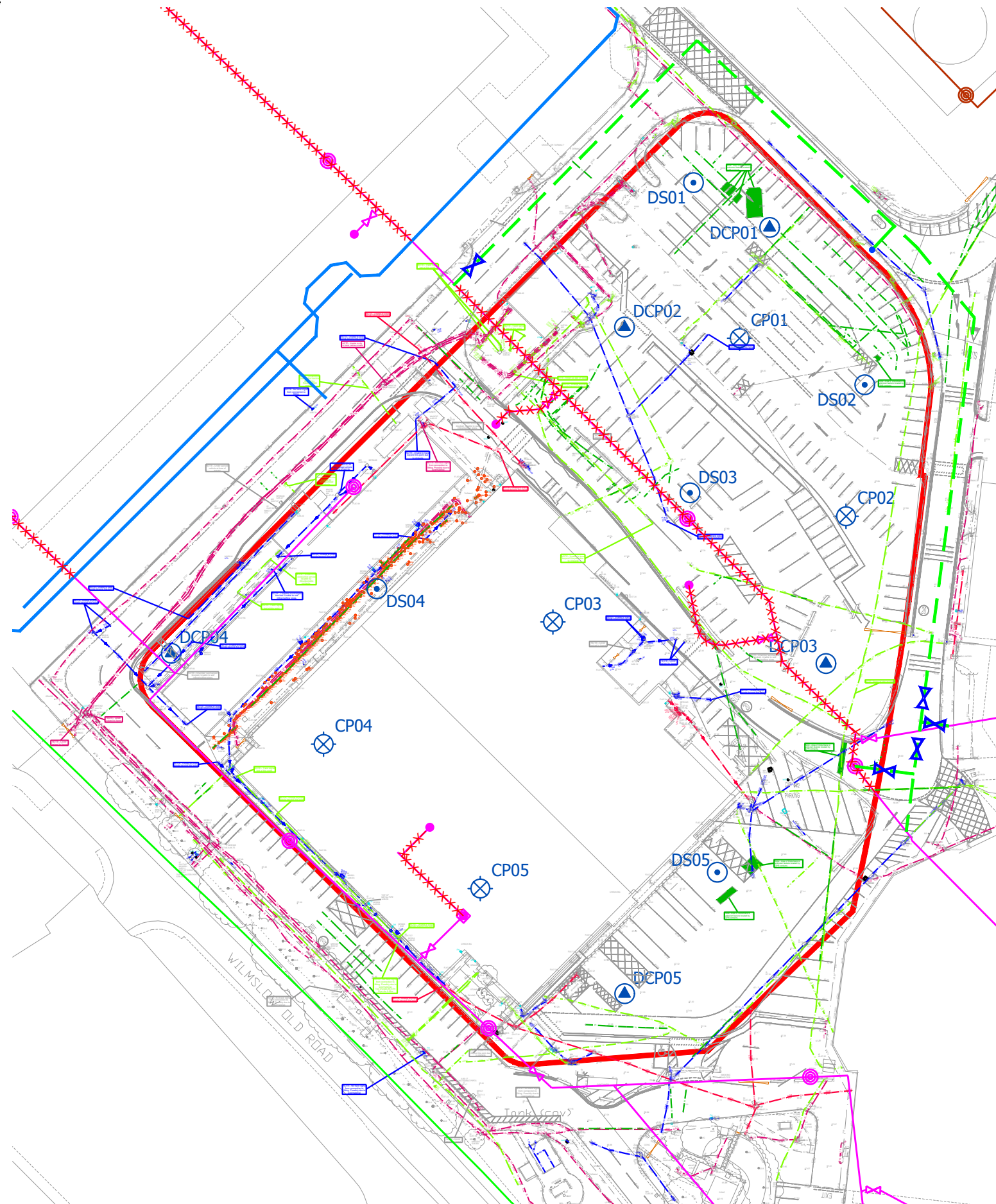
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MANCHESTER AIRPORT**

Sheet Title:
SITE BOUNDARY PLAN

Model Reference:
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Client Project Number	Originator	Function	Spatial	Form	Role	Number	Revision	
B041631	- TTE -	00	- XX -	DR	- U -	0002	P01	



SERVICES

- SW STORM WATER SEWERS
- FW FOUL WATER SEWERS
- WM WATER MAIN
- GM GAS MAIN
- EL ELECTRIC CABLES
- DUCT CABLE DUCTING
- BT (UNDERGROUND) CABLE TV
- CCTV CLOSED CIRCUIT TV
- UI UNIDENTIFIED FEATURE
- UP UNIDENTIFIED PIPE
- UC UNIDENTIFIED CABLE
- UNPR UNPROVEN FEATURE
- SW END OF TRACE
- FW LATERAL CONNECTIONS
- FW CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
- SW CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
- COVER POSITION FROM CCTV REPORT - NOT SURVEYED ON TOPOGRAPHICAL SURVEY.
- BURIED FEATURE FOUND USING RADAR

WATER MAINS

- ROUTE TO BE ABANDONED
- EXISTING WATER MAIN 1
- EXISTING WATER MAIN 2
- EXISTING WATER MAIN 3
- PROPOSED WATER MAIN DIVERSION
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE

NOTE:
SERVICES TAKEN FROM SURVEY OPERATIONS
DRAWINGS 22L135/001, 002 & 003 DATED FEB 23.

WATER MAIN LOCATIONS TAKEN FROM TETRA TECH
DRAWING B071631-TTE-00-XX-DR-C-412305-P03
DATED NOV 22.

KEY

- SITE BOUNDARY
- CABLE PERCUSSION BOREHOLE
- WINDOW SAMPLE BOREHOLE
- DYNAMIC CONE PENETRATION TEST

TETRA TECH GI 2023

Proposed Ground Investigation			
Point	ID	Easting	Northing
1	DS01	381155.34	384742.63
2	DS02	381190.63	384700.98
3	DS03	381154.64	384678.67
4	DS04	381090.08	384658.91
5	DS05	381160.26	384600.51
6	CP01	381164.85	384710.56
7	CP02	381186.81	384673.89
8	CP03	381126.38	384652.11
9	CP04	381079.11	384626.90
10	CP05	381111.40	384597.16
11	DCP01	381171.05	384733.40
12	DCP02	381141.13	384712.86
13	DCP03	381182.65	384643.52
14	DCP04	381047.69	384645.65
15	DCP05	381141.15	384575.47

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Sheet Title: EXPLORATORY HOLE LOCATION PLAN					
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Revision 0003					P02
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GENERAL NOTES

1. ALL DIMENSIONS IN METERS UNLESS SPECIFIED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER TETRA-TECH DRAWINGS AND RELEVANT 3rd PARTY INFORMATION
3. TOPOGRAPHICAL LEVELS OBTAINED FROM SURVEY OPERATIONS DRAWING REF. 22135_3D. ALL LEVELS ARE TO BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.
4. MASTERPLAN INFORMATION OBTAINED FROM DRAWING REF. (20993)_OS_MASTERMAP TOPOGRAPHY_LAYER_828204_1061155_05_MASTERMAP.DWG

KEY

-  PROPOSED CONTOURS (MINOR 0.02m/MAJOR 0.10m)
 x 10.000m PROPOSED SPOT LEVEL
 1:10.00 PROPOSED GRADIENT
 x 10.000m EXISTING SPOT LEVEL
 PROPOSED VARYING HEIGHT RETAINING STRUCTURE
 PROPOSED CHANGING LINE

TENDER ISSUE

T02	BOX 4 - CAT A TENDER ISSUE	20.12.2023	MP	DH	NM
T01	CAT A TENDER ISSUE	18.07.2023	MP	DH	NM
Rev	Description	Date	Drn	Chk	App

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Client



Project Name

BOX 4

Sheet Title

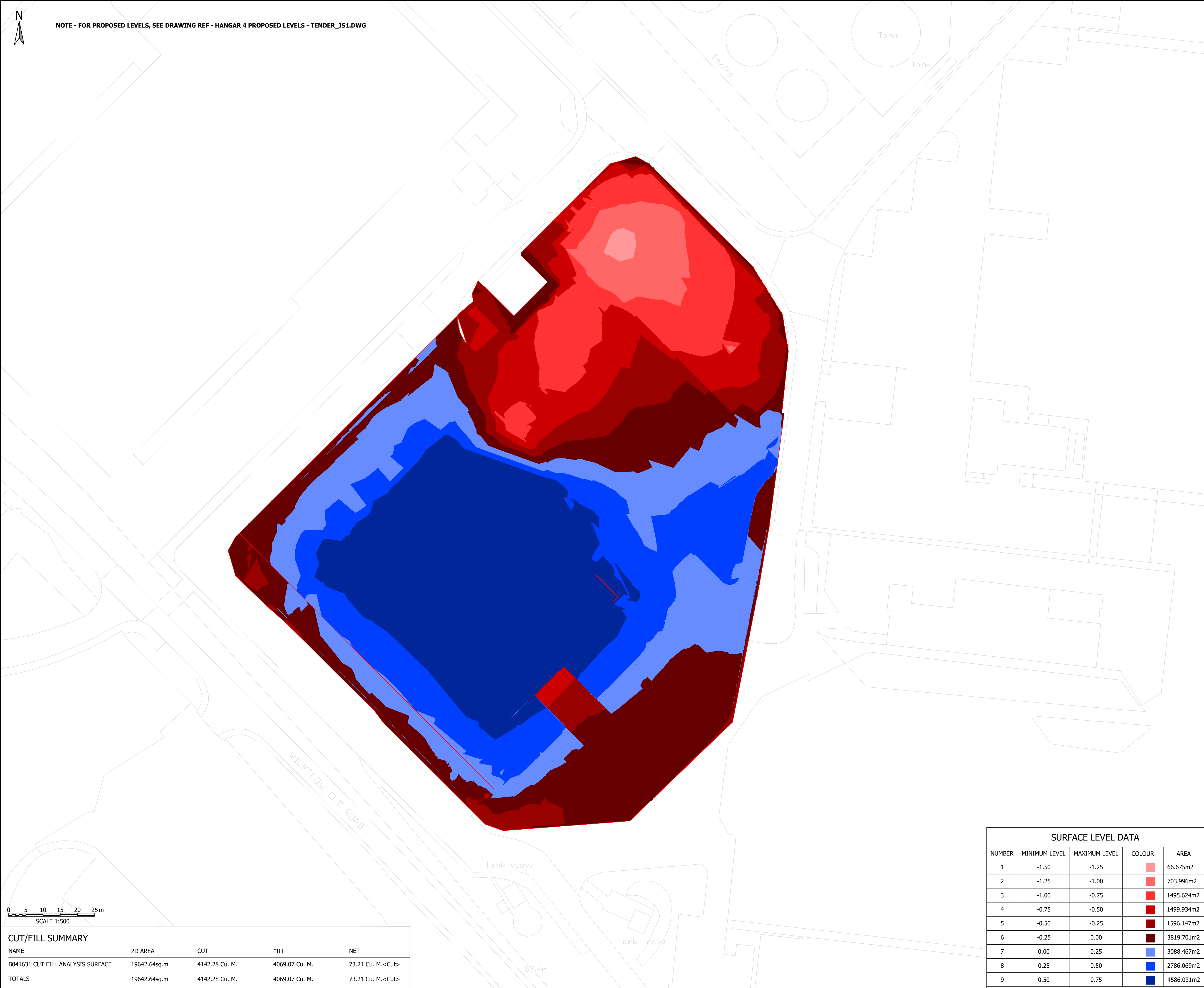
PROPOSED LEVELS & CONTOURS

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
B041631	MA	MAR 23	JS	MAR 23	NM	MAR 23	1:500	S2

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B041631	- TTE	- XX	- XX	- DR	- C	- 0600	T02

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DRAWING REF. XREF - (20993)
OS_MASTERMAP_TOPOGRAPHY_LAYER_828204_1061155_OS_MASTERMAP. ALL LEVELS ARE TO BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.
4. MASTERPLAN INFORMATION OBTAINED FROM DRAWING REF. 020993-RPS-SI-00-M3-A- 5000 - SITE LAYOUT.DWG

DESIGN METHODOLOGY

5. PROPOSED FINAL LEVELS ARE SUBJECT TO FULL COORDINATION WITH ARCHITECT PLANS AND ANY OTHER RELEVANT 3RD PARTIES.
6. SITE STRIP VALUES HAVE BEEN CALCULATED UNDER THE ASSUMPTION THAT 100mm OF ASPHALT WILL BE REMOVED IN PARKING/PAVING AREAS. 100mm OF CONCRETE WILL BE REMOVED WHERE AN EXISTING FLOOR SLAB IS PRESENT AND GRAVEL CONSTRUCTION DEPTH TBC ON SITE BY CONTRACTOR AND REPORTED TO ENGINEER. THESE VALUES ARE ESTIMATED FROM EXISTING GEOTECHNICAL INFORMATION AND ARE SUBJECT TO FURTHER INVESTIGATION.
7. THIS CUT/FILL EXERCISE ALLOWS FOR EARTHWORKS ACTIVITIES TO **FORMATION LEVEL ONLY**. THE FORMATIONS DEPTHS FROM THE FINISHED LEVELS APPLIED ARE:
535mm - CAR PARK AREA
350mm - INTERNAL AND EXTERNAL SLABS
265mm - FOOTWAYS AND LANDSCAPING; SUBJECT TO CHANGE AT THE DETAILED DESIGN PHASE.
8. NO ALLOWANCE HAS BEEN MADE FOR ARISING'S RESULTING FROM DRAINAGE, UTILITIES ETC.

CONSTRUCTION NOTES

9. ANY PROPOSED FILL MATERIAL WOULD NEED TO BE IN ACCORDANCE WITH AN APPROVED EARTHWORKS SPECIFICATION DOCUMENT IN LINE WITH THE SPECIFICATION FOR HIGHWAY WORKS.
10. THE NET CUT/FILLVALUES ASSUMES ALL SITE-WON MATERIAL BELOW PROPOSED CLEARANCE LEVELS WILL BE SUITABLE FOR A RE-USE AS ENGINEERED FILL.

TENDER ISSUE

T02	BOX 4 - TENDER ISSUE	20.10.2023	MA	DH	NM
T01	FOR TENDER REVISED FORMATION THICKNESS	14.09.2023	MA	DH	NM
P02	UPDATED WITH NEW PROPOSED LEVELS	11.08.2023	MA	DH	NM
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Project Name

BOX 4

Sheet Title

CUT FILL ANALYSIS

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
B041631	MA	MAR 23	JS	MAR 23	NM	MAR 23	As Shown	S0

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B041631	- TTE	- XX	- XX	- DR	- C	- 0601	T02
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THIRD PARTY DRAWINGS



Site Layout
1 : 200

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Notes

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- If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.
- This drawing should be read in conjunction with all other relevant drawings and specifications.

Key Plan

Landscaping

Type Mark	Description
LAN 01	Soft Landscaping - Details to be provided by Landscape Architect.
LAN 02	Asphalt Parking Area & Vehicle Entrances all to Engineers Details.
LAN 03	Air-Entrained Concrete Service Yard all to Engineers Details.
LAN 04	Asphalt Pedestrian Footpath to Engineers Details.

Kerb Types Legend

- BS HB2 Kerb - 125mm Upstand
- BS BN Kerb - 0-6mm Upstand
- BS EF Kerb - 0mm Upstand
- Transition Kerb
- Channel Block
- Kerb Drain
- Trief Kerb
- Retaining Wall - Flag on Edge
- 320mm wide gravel strip with pin kerb to paving side

Fence Types Legend

- 2.4m High steel post & V mesh Security fence
- Controlled Landside Security Fencing
- Palisade Fencing for Transformer to ENWL Specification
- Horizontal Louvered Fencing and matching gates
CLD Fencing Screenogril or similar approved
Finish: Hot dipped and polyester powder coated
Colour: Anthracite RAL 7016 to form refuse & External Plant Area

External Protection Legend

- Armco Barrier
- Bollards - Bollards to be bolted down. The bollards are to be painted yellow (BS 10E53). Height to be 1500mm and 168mm in diameter.

White Lining

To be demarcated with 100mm thick hot thermoplastic paint

Bay demarcation to be detailed by specialist sub contractor. To be designed in accordance with Approved Document Part M and BS 8300.

Dimensions shown to centre point of line.

Note: Kerb type, Set Out and Fence Layout as Civil Engineers strategy and coordinated with Tetra Tech Civil Engineers Drawings
B041631-TTE-XX-XX-DR-C-0300 T04
B041631-TTE-XX-XX-DR-C-0700 T06

PI07	Kerb Types and Set Out altered to co-ordinate with Civil Engineers strategy	SC	ET	08/04/24
PI06	Switch Room size increased following comments	SC	ET	14/03/24
PI05	Transformer and Refuse position amended: Switch Room added due to CAT A Supply arrangement comments	SC	ET	08/03/24
PI04	Pedestrian Footpath altered to Asphalt	SC	AM	23/02/24
PI03	Revised Tender submission as per CTI request received 05/10/23	AM	ET	08/12/23
PI02	Scheme updated to incorporate MCC recommendations. External Plant location and kerb layout updated.	SC	AM	10/10/23
PI01	CAT A Stage 3 Issue	AM	SC	14/07/23
Rev	Description	By	Apr	Date

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A TETRA TECH COMPANY

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Client

COLUMBIA THREADNEEDLE
INVESTMENTS

Project

Box 4

Title

Site Layout

RPS Project Number
NK020993

Scale @AO
As indicated

Date Created
18/05/23

Task Team Manager
JM

Information Author
VO

Task Information Manager
AM

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Revision
P07

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APPENDICES

APPENDIX A – REPORT CONDITIONS

APPENDIX A - REPORT CONDITIONS

GEO-ENVIRONMENTAL REMEDIATION STRATEGY

This report is produced solely for the benefit of Threadneedle Curtains and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Tetra Tech. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of Tetra Tech using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to Tetra Tech by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

APPENDIX B – CHEMICAL CRITERIA

Remediation Criteria

Remediation Criteria to be used to assess any material identified during the works as visually impacted by hydrocarbons or asbestos and for verification of any hotspot excavations for those contaminants. All soils on site must have chemical concentrations / visual observations below the Remediation Criteria

Determinand	Remediation Criteria
Asbestos	No visible fragments Asbestos Content testing
TPH (total)	Maximum 4,000mg/kg
Hydrocarbons	No visual or olfactory evidence

Imported Soils

Recorded concentrations to be less than the concentrations in the table in order to be considered to have 'passed' the criteria.

Any imported material for use on site will be required to have chemical concentrations below the Landscape / Import Criteria unless it is natural quarried material which does not require testing.

Determinand	Landscape / Import Criteria (mg/kg). All criteria listed are the maximum allowable values	Source of Criteria
Asbestos	No visible asbestos containing material. Gravimetric Asbestos Quantification 0.001 %	Professional judgement
General	No visual or olfactory evidence of contamination	Professional judgement
Arsenic	640	C4SL
Cadmium	410	C4SL
Chromium (VI)	49	C4SL
Lead	2,300	C4SL
Mercury	58	S4UL
Nickel	980	S4UL
Selenium	12,000	S4UL
Beryllium	12	S4UL
Free cyanide	40	Tetra Tech derived
Acenaphthene	83,000	Professional judgement
Acenaphthylene	84,000	Professional judgement
Anthracene	520,000	Professional judgement
Benzo(a)anthracene	170	S4UL
Benzo(a)pyrene	77	C4SL
Benzo(b)fluoranthene	44	S4UL
Benzo(k)fluoranthene	1,200	S4UL
Benzo(ghi)preylene	3,900	S4UL
Chrysene	350	S4UL

Determinand	Landscape / Import Criteria (mg/kg). All criteria listed are the maximum allowable values	Source of Criteria
Di-benzo(ah)anthracene	3.50	S4UL
Indeno(123cd)pyrene	500	S4UL
Fluoranthene	23,000	Professional judgement
Fluorene	63,000	Professional judgement
Naphthalene	190	Professional judgement
Phenanthrene	22,000	Professional judgement
Pyrene	54,000	Professional judgement
TPH Aliphatic >C5-6	3,200	Professional judgement
TPH Aliphatic >C6-8	4,000	Professional judgement
TPH Aliphatic >C8-10	2,000	Professional judgement
TPH Aliphatic >C10-12	4,000	Professional judgement
TPH Aliphatic >C12-16	4,000	Professional judgement
TPH Aliphatic >C16-35	4,000	Professional judgement
TPH Aromatic >EC5-7	27	C4SL
TPH Aromatic >EC7-8	4,000	Professional judgement
TPH Aromatic >EC8-10	3,500	Professional judgement
TPH Aromatic >EC10-12	4,000	Professional judgement
TPH Aromatic >EC12-16	4,000	Professional judgement
TPH Aromatic >EC16-21	4,000	Professional judgement
TPH Aromatic >EC21-35	4,000	Professional judgement