Environmental Statement Volume 3: Appendices

Proposed Residential-Led Development

Land bound by Rochdale Road, Shellard Road, Harrowby Drive, Johnny King Close, Thornton Street North, Stretton Close and Marston Street, Collyhurst, Manchester

January 2021

Avison Young

Environmental Statement Volume 3 - Appendices

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File Note

Project:	Collyhurst Village
Date:	December 2020
Subject:	Details of Competent Experts

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 571) require that an Environmental Statement (ES) be prepared by 'competent experts'.

Section 18, paragraph 5 of the 2017 EIA Regulations states that *'In order to ensure the completeness and quality of the environmental statement-*

a) The developer must ensure that the environmental statement is prepared by competent experts; and

b) The environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.'

Table 1 set out below includes details and competencies of the technical personnel contributing to the EIA.

Table 1: Competency Details of EIA Personnel

Discipline	Company	Person Profile
Townscape and Visual	Exterior Architecture	**Jonathan Miley (Director), BA, MLA, CMLI** Jonathan Miley is the Director of Exterior Architecture and heads up the Manchester studio. Jonathan has extensive experience in landscape design as well as townscape and visual impact assessment. Jonathan has overseen LVIA and TVIA in a wide range of sectors in both rural and urban situations. **Shaun Lyons (Senior Landscape Architect), BSc, MLA, CMLI** Shaun works as a Senior Landscape Architect in the Manchester studio of Exterior Architecture. Shaun has experience of LVIA and TVIA across a range of sectors and has inputted into environmental statements for projects throughout the UK.
Drainage and Flood Risk	Civic Engineers	**Paul Morris (Director) BEng MA FICE FIHE** Paul Morris is a Director of Civic Engineers and is the civil engineering lead for the Manchester and Leeds Studios. He has 17 years' experience in the assessment, design and delivery of civil engineering and infrastructure and is a Fellow of both the Institute of Highway Engineers and the Institution of Civil Engineers. **Andrea McGee (Civil Design Engineer) BEng** Andrea is a civil design engineer with 3 years of postgraduate experience undertaking Flood Risk Assessments and the production of surface water management and drainage strategies.
Transport and Access	Civic Engineers	**Emily Ingham (Senior Transport Engineer) MEng MCIHT** Emily is a Senior Transport Engineer specialising in sustainable transport and travel planning and is particularly focusing on ensuring developments can be accessed by everyone. This includes considering working patterns and other commitments people have, as well as the need to manage environmental impact by increasing walking, cycling, public transport, car club use and car sharing. Emily has acted as the Travel Plan Coordinator at a number of large developments, ensuring that Travel Plans obligated by planning conditions and Section 106 Agreements are fully implemented, and that residents and employees at the development are able to make sustainable transport choices that suit their lifestyles
Air Quality and Dust	Redmore Environmental	**Jethro Redmore BEng (Hons), MSc, MIAQM, MIEnvSc, PIEMA, CEnv** Jethro Redmore is Director of Redmore Environmental and has worked as a professional environmental scientist for approximately 15 years. He has been responsible for conducting environmental studies for major road improvement and construction schemes, power stations, oil refineries and other major industrial complexes. In addition, he has undertaken air quality assessments for a wide variety of residential schemes, from individual properties to large scale 'eco-towns'. These studies have been carried out for Environmental Statements,

Discipline	Company	Person Profile
		planning applications and to investigate potential nuisance issues, and have often made reference to relevant industry guidance produced by the Department for Environment, Food and Rural Affairs (DEFRA) and the Institute of Air Quality Management (IAQM), amongst others. **Amelia Leatherbarrow-Hurst BSc (Hons), AMIEnvSc, AMIIAQM** Amelia Leatherbarrow-Hurst is a Senior Air Quality Consultant at Redmore Environmental and Associate Member of the Institute of Environmental Sciences and IAQM. She has been responsible for conducting air quality studies for a range of projects, including residential, commercial, employment and industrial schemes with a particular emphasis on dispersion modelling of road vehicle exhaust emissions. In addition, she has produced, or project managed, over 150 assessments in support of planning applications for developments throughout the UK.
Noise and Vibration	Sandy Brown	**Matthew Robinson (Associate), PhD, BSc, MIOA** Matthew has over 10 years of experience in a range of architectural, building services and environmental acoustics projects. His research focused on the prediction of sound and vibration in buildings from transient structure-borne sources, as well as speech privacy and speech security. While at Sandy Brown Associates, Matthew has advised on the design and planning submissions for a variety of residential, commercial, healthcare and performing arts projects, and is responsible for development of in-house calculation tools. **Kane Mitchell (Engineer), BEng, AMIOA** Kane started working at Sandy Brown in 2017 when he was a university student and has since joined the Manchester team as an Engineer in 2019. During his time at Sandy Brown, Kane has worked on a variety of projects. They include healthcare and education buildings, residential schemes and commercial developments. His work completed on projects range from environmental noise and vibration assessments to detailed building acoustic design.
Socioeconomics	Avison Young	**Kyle Welburn (Associate Director), BA, MA, PIEMA** Kyle Welburn is an Associate Director at Avison Young. Kyle has over 9 years' experience of undertaking socio-economic assessments. He has experience of working within a range of sectors including residential, commercial, infrastructure (highways and rail) and energy.
Human Health	Enfusion	**Barbara Carroll (Director) BSc, MSc, CEnv, FIEMA**

Discipline	Company	Person Profile
		Barbara has extensive practical experience of screening, scoping, and assessing plans and projects for their significance with regard to environmental effects – and in accordance with statutory requirements and best practice. She is a specialist in Sustainability Appraisal, Environmental Assessment, and Integrated Assessment, including health, equalities, habitats, cumulative and social impact assessments, and wide practical experience gained over 25 years in all sectors. She has developed methods, for example, cumulative effects assessment; methods for health and equalities effects (spatial and development plans and projects); and Sustainability Threshold Assessment for potential development site options/allocations. She has developed good practice guidance, including contributing to the Department of Health draft guidance on Health in SEA. She has written and presented widely, for example, to RTPI, IEMA, ICE and CIWEM, and is the co-author of The EIA Handbook: A Practical Guide for Planners, Developers and Communities (Telfords, 3rd Edition 2019).
Climate Change	Watt Energy & Consulting Engineers	**Daniel Watt (Director), MEng, MIChemE, LCC, LCEA** Since graduating from Imperial College London Daniel has over 25 years' experience in the MEP Design sector. Forming Watt Energy and Consulting Engineers in 2012 Daniel has established a leading national multi-disciplinary Building Services and Environmental Solution Consultancy. Daniel has developed an excellent reputation for delivering innovative and cost-effective Low Carbon mechanical and electrical design packages across a broad range of public and private sectors. Daniel's expertise in the delivery of high-rise development MEP Low Carbon, sustainable designs has established Watt Energy and Consulting Engineers as a leading national MEP Design Consultancy. **Bernard Stricker, BSc (Hons) Physics, ACIBSE** Bernard Stricker is a Mechanical and Sustainability Engineer at Watt Energy & Consulting Engineers. Bernard has a broad knowledge of mechanical building services alongside a strong skill set in sustainable design including BREEAM, building energy modelling and designing to passive house principles. Bernard has seven years' experience as project engineer, working in the residential, healthcare, office and hospitality sectors. By using modelling software (IES, SAP) Bernard can skilfully tailor the MEP design to be energy efficient and meet key sustainability criteria, whilst also maintaining cost value.
EIA Coordination	Avison Young	**Richard Kevan (Director), BSc, MA (EIA), Mplan, MRTPI, PIEMA** Richard Kevan is a Director at Avison Young where he heads up the Environmental Impact Assessment team. Richard has 15 years' experience of EIA project management and is also a Chartered Town Planner. He provides commercial environmental assessment and planning advice to a wide range of public and private sector clients.

Discipline	Company	Person Profile
		Richard has a wealth of experience in the preparation, co-ordination and management of EIA and is fully conversant with the latest Regulations and best practice guidance. He has experience of working within a range of sectors including residential, commercial, infrastructure, minerals and waste. **Jonny Wilks (Environmental Planner), BSc (Hons), MSc, AIEMA** Jonny Wilks is an Environmental Planner at Avison Young where he provides commercially focussed environmental and sustainability advice, delivering Environmental Statements and EIA advice to clients. This includes day-to-day project management and co-ordination of technical consultants providing input into the EIA process. Jonny has worked on a wide range of projects across a variety of sectors including residential, commercial and infrastructure.

EIA Scoping Report

Proposed Residential Development

Collyhurst, Manchester

March 2020

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Appendix I Collyhurst Village Site Location Plan
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Prepared By: Jonathan Wilks
Approved By: Richard Kevan
Status: Final Draft
Draft Date: March 2020

For and on behalf of Avison Young

1. Introduction

1.1 Far East Consortium International Limited (FEC) and Manchester City Council (MCC) (hereafter referred to as the 'Applicants') is seeking to obtain full planning permission for a residential development on two application sites in Collyhurst, Manchester. The site is located within the administrative authority of MCC.

1.2 The application sites which are being brought forward for development comprise the following:

1. Collyhurst Village; and
2. South Collyhurst.

1.3 A single 'global' Environmental Impact Assessment (EIA) will be undertaken, and a single Environmental Statement (ES) produced which shall assess the potential impacts of both of the applications together.

1.4 The Applicants are in the process of undertaking a range of environmental surveys and technical assessments across the site to inform the design evolution of the proposed development. The information obtained to date has been used to inform the scope of the EIA as set out in this Scoping Report.

Requirement for Environmental Impact Assessment

1.5 The Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017 (hereafter referred to as the 'EIA Regulations') require that for certain planning applications, an Environmental Impact Assessment (EIA) must be undertaken. Schedule 1 of the EIA Regulations lists developments that always require EIA and Schedule 2 of the EIA Regulations list developments that may require EIA if it is considered that they could give rise to significant environmental impacts.

1.6 Regulation 6 of the EIA Regulations makes provision for a developer to request a 'Screening Opinion' from the Local Planning Authority (LPA) to ascertain whether an EIA is required if a development is classed as a Schedule 2 development. This decision is based on the likelihood of significant environmental effects arising in relation to the development proposals. It has been assumed for the purposes of the application that a statutory EIA will be required and therefore the Applicants will be undertaking an EIA in respect of the proposals. It is accepted that the development falls within Schedule 2 (10b) 'Urban Development Projects' for the purposes of the EIA Regulations.

EIA Scoping

1.7 Under Regulation 15 of the 2017 EIA Regulations, a person who is minded to make an EIA application may ask the relevant planning authority to state in writing their opinion as to the information to be provided and subsequently reported in an Environmental Statement (ES) (a 'Scoping Report'). The scoping process is an integral part of undertaking an EIA and its purpose is to provide relevant background information about the sites, the proposed development, key environmental issues and the approach for the assessment of potential effects.

1.8 This Scoping Report outlines the proposed development and identifies issues that will be assessed by the EIA and reported in the ES that will accompany the planning application. The objectives of the scoping process are to:

- Provide a detailed description of the development, including its physical characteristics and land use requirements;
- Identify key environmental topics that the EIA will consider;
- Define the extent to which environmental topics will be investigated;
- Allow consultation with the LPA, and Statutory and Non-Statutory consultees; and
- Provide a mechanism for agreeing the content and methodology of the EIA with stakeholders at an early stage in the process.

Structure of Report

1.9 The report is divided into the following sections:

- **Section 2: Site Context:** This section describes our understanding of the current conditions of the site and the surrounding area.
- **Section 3: Description of Development:** This section provides a description of the proposed development.
- **Section 4: EIA Approach:** This section provides the proposed approach to undertaking the EIA.
- **Section 5: Alternatives:** This section sets out the approach to the alternatives assessment.
- **Section 6: Planning Policy Context:** This section provides details of the planning policies which are relevant to the proposed development.
- **Section 7 – 11: Environmental Assessment Topics:** These sections outline the proposed methodology for the ES and for each technical assessment expressed as chapters and/or appendices of the ES.
- **Section 12: Non-Significant Issues:** This section sets out those environmental issues deemed to be non-significant for the purposes of EIA and would not be included as a chapter in the ES.
- **Section 13: Structure of the Environmental Statement:** This section defines the proposed structure of the ES, chapters and document formats.
- **Section 14: Summary and Conclusions**

1.10 It should be noted that the Scoping Report has been produced using currently available information in relation to the site and the proposed development. However, the design of the proposed development is still evolving and will continue to do so throughout the EIA process. This is important as it allows an iterative design process to be followed which takes account of environmental issues and allows for the incorporation of mitigation measures into the proposals. Therefore, changes to the proposals between the scoping of the EIA and the submission of the application should not necessarily require the EIA to be fully re-scoped. The assessment scopes presented here relate to the general principles of the proposals rather than the specifics; hence the scope can accommodate minor amendments to the site and the proposals. If the scheme changes materially or if the site expands significantly in area, further scoping may be required.

The Environmental Impact Assessment Team

1.11 The ES will be compiled using a wide range of sources and with inputs from competent experts. The organisations and their roles in the project team are listed in Table 1.1 below.

Table 1.1: The EIA Project Team

Discipline	Company
Townscape and Visual	Exterior Architecture
Transport and Access	Civic Engineers
Air Quality and Dust	Redmore Environmental
Noise and Vibration	Sandy Brown
Socio-economic	Avison Young

2. Site Context

2.1 This section sets out the geographical context of the sites and summarises potential environmental constraints and sensitive receptors in their vicinity.

Background

2.2 The proposed developments form part of the Northern Gateway, a joint venture between the Applicants to contribute to the regeneration of a significant area in the north of Manchester, providing approximately 15,000 new homes to the city.

2.3 The application sites lie within two of the neighbourhoods proposed as part of the Northern Gateway Strategic Regeneration Framework (SRF) known as Collyhurst Village and South Collyhurst.

Site Location and Description

Collyhurst Village

2.4 The site is irregular in shape and occupies approximately 4.2ha of land to the east of Rochdale Road, Manchester, within the ward of Harpurhey. The Site Location Plan for the Collyhurst Village site is presented at **Appendix 1**.

2.5 The site comprises 28 residential dwellings, a shop, areas of hardstanding, amenity grassland and trees. The site is bound to the west by Rochdale Road (A664), to the north by an unnamed footpath, woodland and a car dealership, to the east by Anslow Close, Chrunet Street and Thornton Street North and to the south by Shellard Road. Paget Street bisects the centre of the site in an east / west orientation.

2.6 The area surrounding the proposed development site is residential in nature.

2.7 Manchester Victoria Station is the nearest railway station and is located approximately 1.7km southwest of the site. The station predominantly provides local and regional mainline services to the north of England.

2.8 Metrolink services are also available in the area, the closest of which is located at Monsall, approximately 470m northeast of the site.

2.9 There are no designated heritage assets (Scheduled Monuments, Grade I, II* and II Listed Buildings, Conservation Areas, Registered Parks and Gardens or Registered Battlefields) within the site boundary. There is one listed building located within 500m of the proposed development, the Grade II Listed Brierley Statue in Queens Park to west of Park Entrance, located approximately 460m north of the site. The Grade II listed Queens Park Registered Park and Garden is located approximately 290m north of the site.

2.10 A war memorial is located adjacent to the site's southwestern border.

2.11 There are no statutory or non-statutory ecologically designated sites within 2km of the site. The nearest statutory designated site is the Rochdale Canal Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC), located approximately 3.4km northwest of the site boundary. The site lies within the Impact Risk Zone of

the Rochdale Canal SSSI. However, the proposed development does not exceed any threshold that would require MCC to consult with Natural England regarding the potential impacts on the SSSI.

2.12 Moston Brook is culverted beneath Thornton Street to the east as well as beneath the northern extent of the site. Moston Brook is a tributary of the River Irk (located approximately 240m west of the site). Both Moston Brook and the River Irk are designated as a Main River by the Environment Agency.

2.13 The site is located entirely within Flood Zone 1, indicating a less than 1 in 1,000 annual probability of flooding. The majority of the site is at Very Low risk with regards to pluvial flooding. Some isolated Low to High risk areas are located on areas of hardstanding and existing roads on site. The site is not at risk of flooding from reservoirs.

2.14 The western extent of the site is located within the Greater Manchester Air Quality Management Area (AQMA). This AQMA covers the city centre and major roads in and out of the city.

2.15 The site is not located in an Area of Outstanding Natural Beauty (AONB) or any other area designated for its landscape value.

2.16 According to British Geological Survey (BGS) maps the superficial deposits on site comprise Devensian Glacial Till, and the underlying bedrock is that of the Pennine Middle Coal Measures Formation; Pennine Upper Coal Measures Formation; and Worsley Delf Rock - Sandstone.

2.17 A review of the Coal Authority Mining Risk GIS System indicates the site is located within a coal mining reporting area. The south eastern border of the site encroaches into a Development High Risk zone.

2.18 The existing noise climate is dominated by road traffic noise emanating from Rochdale Road.

South Collyhurst

2.19 The site is irregular in shape and occupies approximately 0.5ha of land to the south of Whitley Road, Manchester, within the ward of Miles Platting and Newton Heath. The Site Location Plan for the South Collyhurst site is presented at **Appendix 2**.

2.20 The site is currently vacant and comprises areas of amenity grassland, unmanaged grassland, scrub vegetation, trees, a road and hardstanding. The site is bound to the northwest by Whitley Road, to the west by hardstanding and amenity grassland, to the south by a railway and to the east by grassland and warehouse buildings. Winscombe Drive bisects the centre of the site in a southwest / northeast orientation.

2.21 The areas surrounding the site are predominantly residential with some industrial and commercial uses to the southeast beyond the railway.

2.22 Manchester Victoria Station is the nearest railway station and is located approximately 1.4km southwest of the site. As noted above, this provides local and regional mainline services to the north of England.

2.23 Metrolink services are also available in the area, the closest of which is located at Queens Road, approximately 920m northwest of the site.

2.24 There are no designated heritage assets (Scheduled Monuments, Grade I, II* and II Listed Buildings, Conservation Areas, Registered Parks and Gardens or Registered Battlefields) within the site boundary. There

is one listed building located within 500m of the proposed development, the Grade II Listed Corpus Christi Basilica, located approximately 410m southeast of the site. The Grade II listed Queens Park Registered Park and Garden is located approximately 950m north of the site.

2.25 There are no statutory or non-statutory ecologically designated sites within 2km of the site. The nearest statutory designated site is the Rochdale Canal SSSI and SAC, located approximately 3.7km northwest of the site boundary. The site lies within the Impact Risk Zone of the Rochdale Canal SSSI. However, the proposed development does not exceed any threshold that would require MCC to consult with Natural England regarding the potential impacts on the SSSI.

2.26 There are no watercourses on site or in the immediate vicinity. The nearest watercourse is the River Irk, located approximately 560m west of the site.

2.27 The site is located entirely within Flood Zone 1, indicating a less than 1 in 1,000 annual probability of flooding. The majority of the site is at Very Low risk with regards to pluvial flooding. The existing roads and areas of hardstanding on site show Low to Medium risk. The site is not at risk of flooding from reservoirs.

2.28 The site is not located within an AQMA. The Greater Manchester AQMA is located along Rochdale Road and Oldham Road, approximately 170m northwest and 120m southeast respectively.

2.29 The site is not located in an Area of Outstanding Natural Beauty (AONB) or any other area designated for its landscape value.

2.30 According to British Geological Survey (BGS) maps the superficial deposits on site comprise Devensian Glacial Till, and the underlying bedrock is that of the Pennine Upper Coal Measures Formation.

2.31 A review of the Coal Authority Mining Risk GIS System indicates the site is located within a coal mining reporting area and is within a Development High Risk zone. Former mine entries are located adjacent to the north eastern boundary

2.32 The existing noise climate is dominated by road traffic noise and passing trains.

Environmental Constraints and Potentially Sensitive Receptors

2.33 Features of the sites and surrounding area may form a constraint to development or be identified as a sensitive receptor that may be affected by the site. Identifying such constraints and receptors early in the design process ensures that mitigation measures are designed into the proposals progressively from the outset and are fully integrated into the design where appropriate. Details on specific environmental constraints and opportunities found at and around the site are presented within the technical sections of this document (see sections 7 to 11).

3. Description of Development

3.1 The planning application will be submitted to MCC in detail and will propose a residential development.

3.2 The proposals for the Collyhurst Village site include for residential development of approximately 300 dwellings including a mix of townhouses and mid-rise (up to 6-storey) apartment buildings and will include a percentage of affordable housing. The proposals will also include a

3.3 Demolition of the 28 existing residential dwellings and shop on the Collyhurst Village site will also be applied for. It should be noted that the residential dwellings will be demolished after new social housing on site has been constructed.

3.4 The proposals for the South Collyhurst site include approximately 30 dwellings comprising townhouse style dwellings which will be 100% affordable housing.

3.5 The ES will include a detailed description of the proposed development at the site and the construction activities required for its delivery. This section of the ES will also include a summary of the general principles required to avoid or reduce impacts during the construction stage.

3.6 The description of the proposed development section will also include information on those mitigation measures that have been designed-in to the proposals, having been identified as necessary through the EIA process. These features of the proposals will be considered to be part of the development that is subject to the final assessment of impacts presented in the ES. Where mitigation measures are not of a nature that they can be designed into the scheme, they will be specified separately. Further detail relating to the approach to mitigation is presented in Section 4 of this Scoping Report.

3.7 The elements set out above are currently anticipated to form part of the proposals, the details will be informed and refined through the EIA process and the continuous process of consultation with the LPA and key stakeholders.

4. EIA Approach

4.1 This section details the proposed technical areas for assessment within the ES. It sets out the legislative framework, an outline of the intended approach to assessment and the potential effects that have been identified at this stage. Where appropriate and where sufficient information is known, it outlines potential mitigation measures.

Potentially Significant Issues

4.2 The scoping exercise has identified several study areas which have the potential to generate significant environmental effects. Accordingly, the following environmental issues have been 'scoped in' to the EIA for the proposed development:

- Townscape and Visual;
- Transport and Access;
- Air Quality and Dust;
- Noise and Vibration; and
- Socio-economic.

4.3 Each of these technical assessment areas is discussed in greater detail in sections 7–11 of this report.

EIA Approach and Methodology

4.4 The ES will be prepared to fully comply with Schedule 4 (Part I and II) of the 2017 EIA Regulations: 'Information for Inclusion in Environmental Statements'; and in accordance with National Planning Practice Guidance ('NPPG').

4.5 The 2017 EIA Regulations state that:

> *"4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions), impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.*
>
> *5. A description of the likely significant effects of the development on the environment resulting from, inter alia:*
>
> *a) the construction and existence of the development, including, where relevant, demolition works;*
>
> *b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
>
> *c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*

d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(a) and Directive 2009/147/EC(b)."

4.6 As such a consistent approach will be adopted throughout the EIA to ensure that likely significant effects are identified and evaluated in a transparent manner. Each environmental assessment topic will adopt the following approach:

- Baseline Assessment and Identification of the Study Area;
- Identification of Sensitive Receptors;
- Identification of Potential Impacts during Construction and Operation of the Proposed Development (including indirect, direct, adverse and beneficial);
- Assessment of Impact Significance;
- Identification of Potential Impacts Mitigation Measures;
- Assessment of Residual Impacts; and
- Assessment of Cumulative Impacts.

Assessment Parameters

4.7 The assessment of effects will be undertaken on the basis of set parameters including the quantum of development and the detailed planning application drawings and elevations. These drawings will include detailed layout, heights, elevations, widths and access arrangements to the site.

4.8 A Design and Access Statement will accompany each of the planning applications and will present further indicative information about the proposed developments, as will the description of developments presented in the ES.

Significance Criteria

4.9 The assessment of significance will be undertaken for all potential effects to determine their relative importance. The following criteria will be considered when assessing their significance:

- Magnitude (size of effect);
- Spatial extent (size of the area affected);
- Duration (short, medium or long term);
- Nature of the effect (direct or indirect, reversible or irreversible);
- Sensitivity of the surrounding environment and receptors;
- Inter-relationship between effects;
- International, national or local standards; and
- Relevant planning policy.

4.10 Where appropriate and not restricted by the requirements of specific guidance, the significance criteria below will be used to categorise predicted effects. Where alternative classifications have been used in order to comply with specific guidance, they will be explained in the methodology sections within each technical assessment. The significance levels identified can be either adverse or beneficial.

Table 4.2: Significance Criteria

Significance	Criteria
Major	These impacts are likely to be important considerations at a regional or district scale but, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process. Mitigation measures and detailed design work are unlikely to remove all of the impact upon the receptor.
Moderate	These impacts, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or a particular resource. They represent issues where impacts will be experienced but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon affected communities or interest. Some residual impact may still arise.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project and consideration of mitigation measures.
Negligible	Potential impact is beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.
No Impact	No Impact is predicted.

Mitigation

4.11 As set out within paragraph 7 of Schedule 4 of the 2017 EIA Regulations, the EIA will include:

"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description

should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases".

4.12 Mitigation is defined as those measures that are required to avoid, remedy or offset the identified environmental impacts of a project. As described in Section 3, those mitigation measures that are identified through the EIA process and which have been designed into the proposals such that they appear on the application plans and are integral to the development will be considered to be part of the development for the final assessment as presented in the ES. Embedded mitigation will be described in full in Chapter 5: The Proposed Development under 'Embedded Mitigation' section. This 'embedded' mitigation will be described in each technical chapter prior to the assessment of potential impacts. It is placed in this order to enable an assessment of the impacts to be made which takes into account the mitigation measures which have been designed in to the proposed development, i.e. embedded into the design.

4.13 Mitigation that is not embedded into the proposals and which requires a commitment from the applicants to carry out further actions will be specified in the Mitigation section of each technical chapter and summarised in Chapter 13: Summary of Mitigation and Residual Effects of the ES. These measures would then be secured through the application of conditions attached to the planning permission or through an appropriate legal framework, such as the Section 106 agreement.

Residual Effects

4.14 Each ES chapter will conclude with a summary of the residual effects of the developments once all related mitigation measures have been taken into account.

Cumulative Effects

4.15 The EIA Regulations also require the assessment of cumulative effects. Cumulative effects may be divided into two categories as follows:

1. Additional impacts arising from interrelationships within the same scheme; and
2. Those arising from the scheme in combination with other proposed developments.

4.16 Most cumulative effects result when construction phases of more than one development overlap. However, the assessment will also assess operational effects of more than one development, where appropriate.

4.17 Cumulative effects will be discussed as a separate chapter, assessing the potential for cumulative effects for each technical assessment, thus ensuring that the LPA can evaluate the impacts of the development in isolation and in conjunction with other developments in the area.

4.18 Avison Young have undertaken a cumulative site search for planning applications submitted to MCC planning portal which have the potential for cumulative effects. The search area extended to a 1km radius from the site boundaries. This search area is considered robust given the nature of the development and its location.

4.19 Table 4.3 shows the potential cumulative sites that have been identified in the vicinity of the proposed development. The ES shall consider the potential cumulative effects in combination with the proposed development.

Table 4.3: Cumulative Sites

Planning Reference	Status	Application Summary	Approx. Distance/ Direction
125596/FO/2019	Awaiting decision – validated on 29th November 2019	Planning Application for housing-led mixed use redevelopment comprising: a maximum of 410 new dwellings (Class C3); and comprising Class A1 (retail), Class A3 (restaurant/cafe) Class B1 (business/office use) (maximum floorspace 744 sq.m GIA in total); recreation open space and landscaping; and associated access off Hulme Hall Lane, Varley Street and Iron Street, infrastructure provision and car parking	640m southeast of South Collyhurst site and 970m southeast of Collyhurst Village site
114860/FO/2016	Approved 19th October 2017 – under construction	Erection of a part 6, part 10, part 15, part 24 storey building to form 415 residential apartments (Use Class C3a) together with commercial floor space (268 sqm) (Use Classes A1, A2, A3, A4, B1 and/or D2) with associated car parking, public realm, hard and soft landscaping, access from Dantzic Street and other associated works following demolition of existing buildings	820m southwest of South Collyhurst site and 1km southwest of Collyhurst Village site

4.20 We invite MCC to confirm whether there are any other existing, approved or committed developments in the area that should be included within the assessment of cumulative effects. The assessment of the cumulative sites will be based on the description of development, red line plans and any available masterplans/parameter plans for any identified sites.

4.21 Consideration will be given to the potential synergistic cumulative effects, arising from the interaction of two or more environmental effects associated with the proposed development on a given receptor or resource.

5. Alternatives

5.1 The 2017 EIA Regulations require that the ES provide:

> *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

5.2 Therefore, the ES will define the following types of alternatives considered by the applicants:

- The 'do nothing' alternative: Consideration of the impacts in the absence of the development; and
- Alternative layout and designs: A description of the design evolution based on environmental constraints, potential effects and other considerations, with a description and account of the main reasons why alternative layouts were dismissed and why the preferred design option was selected.

5.3 No alternative sites will be considered for the development. The site is within the Applicants' control and is located within the boundary of the Northern Gateway SRF.

6. Planning Policy Context

6.1 A planning policy context chapter will be included within the ES to assess the proposals against relevant planning policy. The details of policies relating to specific topics addressed within the ES will be contained within the relevant technical chapters.

Context

National Planning Policy

6.2 The Planning Policy will comprise a series of national planning documents including the National Planning Policy Framework ('NPPF') and Planning Practice Guidance ('PPG') alongside any relevant policies and guidance. Local planning policy documents will inform the approach to the EIA and the requirement for the proposed development.

6.3 The NPPF states the key role of planning is to contribute to the achievement of sustainable development. The NPPF sets out a series of planning policies to achieve sustainable development. Those policies of relevance will be considered and reviewed in light of the proposed development.

Local Planning Policy

6.4 Currently the future use and development of land and buildings in Manchester is guided by the Manchester Core Strategy (Adopted March 2012) and the saved policies of the Unitary Development Plan for the City of Manchester (1995).

6.5 The site is identified as an 'Inner Area' in the Core Strategy. Development proposals therefore should be in accordance with Spatial Principle 1 (SP1), which places emphasis on the creation of neighbourhoods of choice, providing high quality and diverse housing around district centres, which meet local needs, all in a distinct environment.

6.6 The development area also lies within the 'North Manchester' designation of the Core Strategy and as such policy H3 is relevant. This policy states that 11,840 new dwellings are to be provided in North Manchester. The site also falls within the defined regional centre in Core Strategy Policy EC3.

6.7 The site is located within the Northern Gateway SRF which aims to deliver "*a series of vibrant, sustainable and integrated residential neighbourhoods within the extended city centre of Manchester*".

Approach

6.8 The merits of the proposed development will be examined against the relevant planning policies and guidance adopted at national and local levels.

6.9 In particular, the following issues will be considered in the ES to set the planning context:

- General planning principles;
- The compatibility and appropriateness of the proposed uses;

- The Environment;
- Employment;
- Transport;
- Sustainability and Energy; and
- Design (policy and guidance).

7. Townscape and Visual

7.1 Townscape and visual effects are independent but related issues. Townscape effects are changes in the townscape as a resource, including its constituent elements, the aesthetic and perceptual aspects of the townscape, and its distinctive character; visual effects relate to the effects of change upon the views available to people and their visual amenity. The Townscape and Visual Impact Assessment (TVIA) is to be carried out by Exterior Architecture.

Site Context

7.2 The sites are located within 300m of each other with South Collyhurst located directly south of Collyhurst Village. For developments of this scale, and considering the urban location of the site, a study area with a radius of 2km is required. The study area will be calculated by creating two separate 2km study areas centred on each site which will then be combined for the purposes of the field work and assessment.

7.3 Townscape designations of importance that lie either completely or partially within the proposed study area comprise:

7.4 *Conservation Areas:* There are seven Conversation Areas that sit wholly or partially within the study area, Newton Heath, Crab Lane, Crumpsall Lane, Hermitage Road, Ancoats, Sudehill, Cathedral. The closest conservation area to the sites is the Ancoats Conservation Area located approximately 770m southwest of South Collyhurst and 1.2km southwest of Collyhurst Village.

7.5 *Listed Building and Structures*: There are a number of listed buildings and structures within the study area on account of the historic urban nature of the site and surrounding area. The closest listed structure to the Collyhurst Village site is the Grade II listed Brierley Statue in Queens Park located approximately 460m north of the site. The closest structure to the South Collyhurst site is the Grade II Listed Corpus Christi Basilica, located approximately 410m southeast of the site. Other listed building generally sit within the various Conversation Areas listed above.

7.6 *Recreation Routes:* There are a number of Recreation Routes within the study area which include National Cycle Routes and Long-Distance Footpaths. With reference to NCA's, this include NCA 60 which runs along Queens Road approximately 100m to the east of the Collyhurst Village site and NCA 66 which runs along the Ashton Canal to approximately 1km southeast of the South Collyhurst site. There are four Long-Distance Footpath including the Medlock Valley Way and Cheshire Ring Canal Walk to the south, the Irwell Sculpture Trail to the west and the Oldham Way to the east.

7.7 *Registered Parks:* There are two Registered Parks within the study area, Queens Park is located approximately 200m to the north of Collyhurst Village site and Philips Park Cemetery is located approximately 1.3km to the southeast of the South Collyhurst site.

7.8 *National and Local Character Areas:* The sites sit with National Character Area 55 Manchester Conurbation. This character area is characterised by dense urban and industrial development, commercial, financial, retail and administrative centres, commuter suburbs and housing, interspersed with a network of green

infrastructure. With regards to the Manchester Urban Historic Landscape Characterisation study, the sites sit within the Residential historic character type.

Planning Policy Context

National Planning Policy

7.9 Paragraph 7 of the NPPF states that: "*The purpose of the planning system is to contribute to the achievement of sustainable development.*"

7.10 The NPPF sets out a series of 17 core land-use planning principles. At paragraph 124, states that "*The creation of high quality buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable in communities*."

National Planning Practice Guidance

7.11 The National Planning Practice Guidance (NPPG) (DCLG, 2014) (Ref. 15-3) provides a web-based resource in support of the NPPF.

7.12 NPPG: Design – Section 1: The Importance of Good Design, states that: "*As a core planning principle, planmakers and decision takers should always seek to secure high quality design*". Section 3 focuses on the qualities that define well designed places and spaces, stating that: "*A well designed space has a distinctive character*". It lists the physical aspects that contribute to distinctiveness, including the local pattern of street blocks and blocks, building forms, details, materials, style and vernacular. It further adds that: "*Distinctiveness is not solely about the built environment*" – it also reflects an area's function, history, culture and its potential need for change.

Local Planning Policy

7.13 There are a number of relevant local planning polices that will be referenced in the assessment, these include.

7.14 CC9 – Design and Heritage, the policy states '*Design of new buildings will need to be of the highest standards in terms of appearance and functions.*'

7.15 EA 15 - Biodiversity and Geological Conservation, the policy states '*The Council will seek to maintain or enhance sites of biological and geological value throughout the city.*'

Local Development Frameworks

7.16 The Northern Gateway Strategic Regeneration Framework (SRF) (February 2019) was approved by MCC's executive on 13th February 2019. The proposed development is located within the Collyhurst Village and South Collyhurst neighbourhoods of the SRF. The document provides relevant information on the existing character of the area as well as setting a framework for the scale, type and quality of development that is likely to be appropriate there.

Recognised Guidance

7.17 The assessment will be undertaken in line with best practice guidance documents to inform the approach and impact assessment. This guidance is considered to be the most thorough and current in relation to the assessment of landscape character and visual effects. Those documents which will be used to inform the assessment are listed below:

- 'Guidelines for Landscape and Visual Impact Assessment Third Edition' (2013) (GLVIA 3) – produced by the Landscape Institute (LI) and the Institute of Environmental Management and Assessment (IEMA);
- 'Landscape Character Assessment' (2002) guidance produced by The Countryside Agency and Scottish Natural Heritage; and
- 'Visual Representation of Development Proposals' Technical Guidance Notes 06/19 (2019).

7.18 The scope of the Guidelines for Landscape and Visual Impact Assessment include townscape. The guidelines are not prescriptive and the approach taken to any assessment must be tailored to the nature of the proposed development, its location and likely effects. This especially applies in the context of a townscape assessment within an urban context.

7.19 The assessment of townscape and visual effects will also draw on relevant aspects of the 'Guidance on Tall Buildings' published by CABE and English Heritage in 2007 and subject to a draft update by the Design Council and English Heritage in 2014.

Approach

7.20 Baseline information-gathering has included a review of the existing townscape planning policy context and townscape and land use designations, published sources of townscape character, consideration of topography and site and visual appraisal of the site and vicinity based on a site visit in winter conditions.

7.21 The methodology, scope of townscape and visual receptors together with a list of viewpoints representative of the visual receptors will be agreed with a suitably experienced officer at MCC.

7.22 Visual receptor groups within the study area and visual envelope will be agreed with MCC but would include, those in residential areas, road users and users of Public Rights of Way (PROW).

7.23 The assessment would be undertaken using a methodology based on principles of good practice set out in accordance with Landscape Institute IEMA, "Guidelines for Landscape and Visual Impact Assessment" (Third Edition, 2013) GLVIA 3[1]. The assessment would include the potential townscape and visual effects of the development, both at the construction and operational phases.

7.24 Assessments will be made at the baseline year 2020, during construction; on completion; in the winter without the benefit of effective new planting; and 15 years thereafter, on completion in summer, with the benefit of effective planting.

[1] Landscape Institute and IEMA, 2013, GLVIA 3.

7.25 In accordance with current good practice, this assessment will address townscape and visual effects as separate issues. Townscape effects relate to both the effect on the physical features of the site, and on the townscape character of the site and surrounding area. Visual effects relate to typical views of the development from the surrounding area.

7.26 The methodology, scope of townscape and visual receptors together with a list of viewpoints representative of the visual receptors will be agreed with the townscape officer.

7.27 In summary the assessment will:

- Define the study area for the site, identifying key townscape receptors and separately, key visual receptors and their typical/representative views to be used for the visual impact assessment;
- Assess the sensitivity of the townscape and visual receptors (the receiving environment);
- Assess the magnitude of change experienced by townscape and visual receptors;
- Combine these assessments to draw conclusions on the significance of townscape and visual effects; and
- Identity ways in which adverse effects on townscape and/or visual amenity could be avoided, reduced and consider requirements for any mitigation measures.

Cumulative Effects

7.28 Within the Townscape and Visual ES chapter, an assessment of the proposed development is also supplemented by a brief cumulative assessment of approved adjacent developments where relevant, in order to understand if any further potential significant environmental effects are likely to arise.

7.29 A separate cumulative effects chapter will also be presented at Chapter 12 of the ES. This will assess the cumulative impacts of the proposed development in conjunction with any committed developments within the vicinity of the sites identified through the scoping process.

8. Transport and Access

8.1 This section of the ES will assess the potential impacts of the development on the strategic road network in the surrounding area to the site. The assessment of transport and access will be undertaken by Civic Engineers.

8.2 The transport and access ES chapter will refer to the detailed Transport Assessment (TA), which will form an Appendix to the ES.

Site Context

8.1 The Collyhurst Village site is bounded by Rochdale Road to the west, Shellard Road to the south, Anslow Close, Churnet Street and Thornton Road North to the east and an unnamed footpath to the north, which runs between Stretton Close and Rochdale Road. Collyhurst village is around 2.4km northeast of Manchester City Centre.

8.2 The South Collyhurst site is bounded by Wilmcote Road to the north, Whitley Road to the west and the railway line to the east. It is 2km northeast of Manchester City Centre.

8.3 A detailed assessment of the accessibility of both sites will be included in the TAs but for the purposes of this scoping document a brief summary of accessibility by different modes of transport is included below.

8.4 There are employment sites, schools and shops within walking distance of the sites. Pedestrian crossing points are located on Rochdale Road and Queens Road. Dropped kerbs and tactile paving are provided at many of the junctions around the site to aid the movement of people with mobility problems and visual impairments, as well as people with young children in pushchairs. The site is well located for access on foot.

8.5 Rochdale Road has on-road cycle lanes travelling northbound past the site but intermittent facilities southbound. There are also on-road cycle lanes on Queens Road and Oldham Road. Most of Manchester city centre can be accessed within a 15-minute cycle ride from the sites. The site is well located for access by bicycle.

8.6 Monsall Metrolink tram stop is a 10-minute walk or 3-minute cycle from Collyhurst Village and a 16-minute walk or 5-minute cycle from South Collyhurst. Monsall is on the Pink line, which runs between East Didsbury and Rochdale town centre. There are trams every 12 minutes in both directions.

8.7 There are over 30 buses per hour running along Rochdale Road from early in the morning until after 2300. Destinations include Piccadilly Gardens, Shudehill Interchange, Manchester Royal Infirmary, Bury, Rochdale, Middleton and Higher Blackley. The sites are very well connected by bus.

8.8 The sites have both been assessed by TfGM as having a Greater Manchester Accessibility Levels (GMAL) rating of 8 out of a possible 8, where level 8 represents a high level of accessibility and level 1 a low level of accessibility. GMAL are a detailed and accurate measure of the accessibility of a point to both the conventional public transport network (i.e. bus, Metrolink and rail) and Greater Manchester Local Link (flexible transport service), taking into account walk access time and service availability. The method is essentially a

way of measuring the density of the public transport provision at any location within the Greater Manchester region. The sites are therefore very well located for access by public transport.

8.9 Rochdale Road and Oldham Road are both part of Manchester's strategic highway network and can be easily accessed from the site. Queens Road (A6010) is Manchester's 'intermediate' ring road and again can be accessed through a permeable network of streets around the site. The sites are well located for access by motor vehicle.

8.10 The TA will include analysis of reported road accident data. According to crashmap.co.uk, most incidents have occurred on Rochdale Road and Collyhurst Street. No accidents have been recorded on Thornton Street North.

Planning Policy Context

National Planning Policy

8.11 National planning policy in relation to transport matters is set out in the revised NPPF (February 2019).

8.12 With regard to transport, the policies are contained within paragraphs 102 to 111 at Section 9 and all relate to the promotion of sustainable transport. In considering development proposals, paragraph 108 states that:

> *"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:*
>
> *a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
>
> *b) safe and suitable access to the site can be achieved for all users; and*
>
> *c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree"*

8.13 Paragraph 109 then goes on to state that:

> *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe"*

Local Planning Policy

Manchester Core Strategy (2012-2027)

8.14 **Policy CC5 – Transport –** states that the Transport Strategy for Manchester City Centre will be delivered to ensure that transport is managed in a way which supports the projected growth of the City Centre.

Developers should work with public transport providers to ensure that all users are able to access development by sustainable means, especially taking account of times when developments are likely to be busiest.

Proposals will be supported that improve pedestrian safety, improve air quality and increase the scope for accessible public realm improvements. The council will seek to ensure that development includes adequate

parking provision for cars and bicycles. This should be based on the parking standards described in Appendix B of the Core Strategy.

8.15 **Policy T1 – Sustainable Transport** - To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:

- Improve choice by developing alternatives to the car.
- Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car.
- Improve access to transport services and facilities in order to enable disabled people and people with mobility impairments to participate fully in public life.
- Improve pedestrian routes and the pedestrian environment.
- Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail).
- Contribute to improvements to the extent and reliability of the public transport network through safe and attractive waiting and interchange facilities, better priority, improved services and information provision.
- Improve and develop appropriate road, rail and water freight transport routes and associated intermodal freight transport facilities in order to assist in the sustainable and efficient movement of goods.
- Facilitate modes of transport that reduce carbon emissions e.g by incorporating charging points for electric vehicles, subject to their appropriate design and location.
- Would reduce the negative impacts of road traffic, for example, congestion, air pollution and road accident casualties.
- Take account of the needs of road users according to a broad hierarchy consisting of, in order of priority:
    - Pedestrians and disabled people;
    - Cyclists, public transport;
    - Commercial access;
    - General off-peak traffic; and
    - General peak time traffic.

8.16 **Policy T2 – Accessible Areas of Opportunity and Need** – The Council will actively manage the pattern of development to ensure that new development:

- Is located to ensure good access to the City's main economic drivers, including the Regional Centre, the Oxford Road Universities and Hospitals and the Airport and to ensure good national and international connections
- Is easily accessible by walking, cycling and public transport; connecting residents to jobs, centres, health, leisure, open space and educational opportunities. Particular priority will be given to providing all residents access to strategic employment sites including:

- Links between North Manchester residents and key employment locations, including the City Centre, Central Park, Salford Quays and Chadderton Industrial Estate and Trafford Park.
- Links within East Manchester to employment locations, Central Park and Eastlands in particular.
- Links within Central Area between residents and employment, the Corridor in particular and east/west connectivity for residents in Central Area to employment areas in Trafford and East Manchester
- Maintaining strong links between residential areas in the South and the Regional Centre and improving connectivity with the Airport.
- Ensuring good links between Wythenshawe residents and the Airport and further employment opportunities in Stockport, Trafford and the Regional Centre.

- Within the City Centre, provides a level of car parking which reflects the highly accessible nature of the location, as well as the realistic requirements of the users of the development. Elsewhere, all new development should provide appropriate car parking facilities, taking account of the guidance in appendix B, which reflects policy in the Regional Strategy (RS). In all parts of the City proposals should have regard to the need for disabled and cycle parking, in line with appendix B. If the RS is revoked the Council will continue to use these standards when applying this policy. Standards are set for two different area types:
  - District Centres
  - Areas not within the City Centre or District Centres

(The car parking standards are maximums and the cycle and disabled car parking standards are minimums. However, the Council will take the circumstances of each proposal into account to establish what level of parking is appropriate.)

- Includes proportionate Traffic Impact Assessments and Travel Plans for all major applications and for any proposals where there are likely to be access or transport issues.

8.17 **Policy T3 – Strategic Integration –** The council will support proposals that contribute to an economically and environmentally sustainable transport network including the following strategic transport initiatives:

- Metrolink extensions to Rochdale, Oldham, Ashton, South Manchester and the Airport. The Council also supports future aspirations to extend the network to Trafford Park and Stockport.
- A second Metrolink crossing in the City Centre.
- A Metrolink extension to Marple on the current heavy rail network.
- Improvements to the heavy rail infrastructure.
- The Cross City Bus Package comprising new connections through the City Centre to Parrs Wood, Middleton and Salford.

8.18 Any proposals which would prejudice the implementation of the strategic integration of projects will be refused.

Greater Manchester Transport Strategy 2040

8.19 The Greater Manchester Transport Strategy 2040 outlines the growth strategies for the Greater Manchester region to 2040, including multi-modal transport options and the growth of non-motorised transport, particularly for commuting to the City Centre.

8.20 The strategy identifies a vision of "world class connections that support long-term, sustainable economic growth and access to opportunity to all" and aims to focus on creating an "*integrated, sustainable, and well co-ordinated transport system which supports a wide range of travel needs*", allowing the transport system to be more customer focused and responsive to changing travel needs.

8.21 The strategy makes note of an increased investment toward public transport, with medium and long term heavy and light rail strategies to connect both areas of Greater Manchester and cities across the north, increased frequency and development of the Metrolink network, and integration across transport modes of ticketing and door-to-door transport.

8.22 Walking and cycling links are also stated to be vital to the strategy, with investment in walking route networks to local and regional centres, segregated from the road network to allow direct entry to public transport interchanges, as well as improved cycle parking and cycling facilities at key destinations with greater on-street wayfinding.

8.23 The accessible location of the site would encourage travel by sustainable modes, supported by measures in the TP.

Other Relevant Policy, Standards and Guidance

Northern Gateway – Strategic Regeneration Framework

> *"The Vision for the Northern Gateway is to deliver a series of vibrant, sustainable and integrated residential neighbourhoods within the extended city centre of Manchester. These neighbourhoods will provide a range of housing options in a high-quality, well managed environment, with high levels of connectivity that link the growth of the city centre with surrounding Manchester communities. This will include the delivery of a range of affordable housing products to meet the needs of residents on a range of incomes. The Northern Gateway SRF will support long-term growth and promote economic, social and cultural uses to support the creation of high performing and sustainable new communities where people choose to live, work, and play."*

8.24 Core objectives presented to support the regeneration framework are listed as follows:

- A unique and high-quality residential-led regeneration scheme;
- A varied network of high-quality green streets and public open spaces;
- Manchester's unique city river park;
- Build on the best of what is there;
- Improve connectivity across the northern gateway and beyond;
- Create new gateways to and from the city centre;
- Promote truly sustainable places; and

- Foster the emergence of local retail and service hubs.

Approach

Assessment Methodology

8.25 The aim of the assessment is to identify, as far as reasonably possible, the nature of the transport changes within the area of the proposed development, to assess the significance and to make appropriate recommendations.

8.26 The Transport Assessment (TA) will consider the traffic impacts during construction as well as impacts during the operation of the proposed development.

8.27 The content of the TA, including trip rates and junctions that require assessment, will be agreed with MCC and Transport for Greater Manchester (TfGM). Any comments from the highway authorities will be given due consideration as part of the TA.

Desk-based Data

8.28 Various online resources will be used to gather data for the report, the specific details of which can be found below.

Local Highway Network

8.29 A site visit will assess the Local Highway Network surrounding the site. Any information gathered about Traffic Regulation Orders (TROs) in the area will be combined with online map data to provide an analysis of the network.

Highway Safety

8.30 Details of collisions in the area surrounding the site will be taken from crashmap.co.uk for the five years up to 2019. Data on this site is collected from the official data published by the Department for Transport which is based on records submitted to them by police forces across the UK. It only provides information about collisions that happen on public roads, are reported to the police, and that are subsequently recorded. While fatal accidents are almost always known to the police, there are a considerable proportion of non-fatal collisions that are not reported. Collisions are categorised by incident severity, all of which are analysed in the initial assessment. Results can also be filtered by casualty type to help identify any trends in the data, collisions involving pedestrians, cyclists and motorcycles are each looked at individually.

Walking Links

8.31 A site visit and walk around the area will be undertaken to assess the walking network. Details including street lighting, footway conditions and widths, locations of pedestrian crossings, and the types of crossings that are present will be recorded. Hazards in the area (e.g. cars parked on the footway) will also be noted along with any obstacles or route severance that is present.

Cycle Links

8.32 TfGM publish a map of all the cycle routes around the city. This is used to inform the assessment about cycle routes in the area. The maps provide up to date details of traffic free routes, on-road routes (segregated / signposted / advisory etc.), streets that have 20mph limits, and the locations of cycle parking.

Public Transport Links

8.33 Information on transport links in the area was gathered using information from TfGM and National Rail. TfGM provide details of bus and tram services operating in the city while National Rail provide information on the rail services in and out of the city.

Cumulative Effects

8.34 A separate cumulative effects chapter will be presented at Chapter 12 of the ES. This will assess the cumulative impacts of the proposed development in conjunction with any committed developments within the vicinity of the site identified through the scoping process.

9. Air Quality and Dust

9.1 The planning process is a key means of managing and improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality consideration that relates to land use and its development can be a material planning consideration in the determination of planning applications, dependent upon the details of the proposed development. The Air Quality and Dust assessment will be undertaken by Redmore Environmental.

Site Context

Collyhurst Village

9.2 The proposed development is partially located within a designated Air Quality Management Area (AQMA). This has been declared by Manchester City Council due to exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2).

9.3 There are a number of residential properties within the vicinity of the site which may be affected by any fugitive dust emissions during construction of the development. Additionally, there are a number of residential properties within the vicinity of roads which may be affected by changes in traffic flow and associated increases in vehicle exhaust emissions as a result of the operation of the development.

South Collyhurst

9.4 The proposed development is not located within an AQMA. The Greater Manchester AQMA is located along Rochdale Road and Oldham Road, approximately 170m northwest and 120m southeast respectively.

9.5 There are a number of residential properties within the vicinity of the site which may be affected by any fugitive dust emissions during construction of the development. Additionally, there are a number of residential properties within the vicinity of roads which may be affected by changes in traffic flow and associated increases in vehicle exhaust emissions as a result of the operation of the development.

Planning Policy Context

National Planning Policy and Legislation

9.6 NPPF states at paragraph 181 that "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement*".

9.7 Other guidance particularly relevant to air quality assessment is set out in:

- Department for Environment, Food and Rural Affairs (DEFRA) (2007) 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland';
- Department for Environment, Food and Rural Affairs (DEFRA) (Feb 2009) 'Part IV The Environment Act 1995';

- Department for Environment, Food and Rural Affairs (DEFRA) (2018) Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(16);
- Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) (January 2017) 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality'; and
- Institute for Air Quality Management (IAQM) (2014) 'Guidance on the Assessment of Dust from Demolition and Construction'.

Local Planning Policy

9.8 The Manchester Local Development Framework consists of a series of planning documents of which the Core Strategy (July 2012) is central. This was adopted by Manchester City Council (MCC) on 11th July 2012 and provides policies which guide the determination of planning applications within the city.

9.9 Core Strategy, MCC, 2012.

9.10 A review of the Core Strategy indicated the following policies of relevance to the assessment:

"Policy EN16

Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local effect of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the effects on air quality, alongside other plan objectives. This includes cumulative effects, particularly in Air Quality Management Areas."

"Policy DM 1

Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-

[…]

Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

Approach

Construction Phase Assessment

9.11 During the construction of the proposed development there is the potential for air quality effects as a result of fugitive dust emissions from earthworks, construction and trackout activities. It is proposed to assess these in accordance with the IAQM guidance 'Assessment of Dust from Demolition and Construction V1.1'.

Operational Phase Assessment

9.12 During the operation of the development there is the potential for air quality effects as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site, as well as the exposure of future residents to elevated pollution levels. It is proposed to assess these issues through detailed dispersion modelling using ADMS-Roads in order to fully quantify NO_2, particulate matter with an aerodynamic diameter of less than 10µm (PM_{10}) and particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$) concentrations at sensitive locations both with and without the development in place.

9.13 The assessment will be undertaken using relevant traffic data, local land use characteristics and 1-year of hourly meteorological records taken from the Manchester Airport observation station. The modelling outputs will be verified against local monitoring data in accordance with the DEFRA methodology. Impacts will be predicted at sensitive receptor locations and also displayed graphically throughout the assessment extents using contour plots.

9.14 The significance of potential effects at sensitive receptors will be determined based on the predicted magnitude of change in pollutant concentrations as a result of development related road vehicle exhaust emissions and the criteria provided within the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'. Predicted concentrations across the proposed site will be compared with the relevant AQOs to identify any potential areas of exceedence and inform the ventilation strategy for the development.

9.15 If required following assessment of potential impacts, suitable mitigation measures will be identified in order to reduce air quality effects to an appropriate level with reference to the recommendations included within the IAQM guidance.

Cumulative Effects

9.16 A separate cumulative effects chapter will be presented at Chapter 12 of the ES. This will assess the cumulative impacts of the proposed development in conjunction with any committed developments within the vicinity of the sites as identified throughout the scoping process.

10. Noise and Vibration

10.1 The noise and vibration assessment will assess the impacts of the proposed development on existing local noise and vibration sensitive receptors only. The assessment will consider the potential impacts during both the construction and operational phases of the proposed development and where necessary, mitigation measures will be recommended to meet appropriate noise requirements for the scheme. The Noise and Vibration assessment will be undertaken by Sandy Brown.

Site Context

Collyhurst Village

10.2 The surrounding area to the north site is predominantly a residential area. The approximate site area is highlighted in red in **Figure 10.1**.

Figure 10.1: Aerial view of Collyhurst Village site (Source: Google Earth Pro)

10.3 The nearest residential receptors to the site are:

- NSP 1 - Residential properties along Thornton Street North, highlighted in orange in **Figure 10.1**, located within the south eastern extent of the site;
- NSP 2 - Residential properties along Stretton Close, highlighted in yellow in **Figure 10.1**, located approximately 30m from the site boundary; and
- NSP 3 - Residential properties along Rochdale Road, highlighted in blue in **Figure 10.1**, located approximately 70m from the site boundary

10.4 Other noise sensitive receptors include the Church of the Saviour church and school (NSP 4), highlighted in green in **Figure 10.1** approximately 150m from the site boundary. The residential receptors NSP 1 along Thornton

Street are to be demolished following the construction of the affordable housing dwellings within the Collyhurst Village site. As such, these receptors will only be considered during the construction phase assessment.

South Collyhurst

10.5 The surrounding area to the south site is predominantly a residential area. The approximate site area is highlighted in red in **Figure 10.2**.

Figure 10.2: Aerial view of South Collyhurst site (Source: Google Earth Pro)

10.6 The nearest residential receivers to the site are:

- NSP 1 - Residential properties along Wilmcote Road highlighted in orange as per **Figure 10.2**, located approximately 60m from the site boundary; and,
- NSP 2 - Residential properties along Kingsfold Avenue, highlighted in yellow in **Figure 10.2**, located approximately 150m from the site boundary

10.7 Other noise sensitive premises include the Collyhurst Youth Centre, (NSP 3) as well as the Collyhurst nursey school and children's centre (NSP4). These are highlighted in green and blue in **Figure 10.2** respectively, located 75m and 200m from the site boundary.

Planning Policy Context

National Planning Policy

10.8 Paragraph 170 of the NPPF (February 2019) states that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *[…]*

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."

10.9 It also makes the following references to noise at paragraph 180:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason […]"

Recognised Guidance

10.10 The assessment will be undertaken in line with best practice guidance documents to inform the approach and impact assessment. Those documents which will be used to inform the assessment are listed below:

- Professional Practice Guidance on Planning and Noise (2017);
- National Planning Practice Guidance for Noise (2014);
- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings;
- British Standard 4142: 2014 Method for rating and assessing industrial and commercial sound;
- British Standard 7445-1: 2003 Description and measurement of environmental noise. Guide to quantities and procedures;
- British Standard 5228: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2;
- The Highways Agency (2011) Design Manual for Roads and Bridges (DMRB) Volume 11, Part 3, Section 7; and
- Calculation of Road Traffic Noise (1988)

Local Planning Policy

10.11 Manchester City Council (MCC) planning and noise technical guidance December 2015 references the following standards:

- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings;
- British Standard 4142: 2014 Method for rating and assessing industrial and commercial sound;
- National Planning Practice Guidance for Noise (2014)a;
- World Health Organisation: Guidelines for community noise 1999;

- British Standard 5228: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2; and,
- British Standard 6472:2008 Guide to the evaluation of human exposure to vibration in buildings.

Approach

Noise measurements

10.12 Attended noise sample measurements have been undertaken at 7 locations around the sites.

10.13 For the Collyhurst Village site, these are indicated in **Figure 10.3** as location 'L1' to 'L6'.

Figure 10.3: Aerial view of north site (Source: Google Earth Pro)

10.14 For the South Collyhurst site, the measurement position is noted as location 'L7' within **Figure 10.4**.

Figure 10.4: Aerial view of south site (courtesy of Google Earth Pro)

10.15 The attended measurements were carried out on 18 December 2019 during the daytime and on 9 January 2020 during the night-time. All measurements were carried out over 5-minute periods.

Vibration measurements

10.16 Vibration measurements were undertaken at location 'L4' at the north site and at 'L8' at the south site.

10.17 These measurements were carried out on 18 December 2019 and on 20 January 2020.

10.18 The results of the noise and vibration monitoring are located in the Environmental Noise and Vibration Survey Report which is presented at **Appendix 3**.

Outline scope of assessment

10.19 The noise and vibration assessment will include the elements described below:

General

10.20 The noise and vibration impact assessment will be presented in the form of an ES chapter and will be supported by relevant technical information (survey data and calculations).

10.21 Identification of potentially sensitive noise and vibration receptors on and surrounding the site and categorisation of the 'sensitivity' in accordance with EIA terminology, as illustrated in Table 10.1.

Table 10.1: Receptor sensitivity

Sensitivity of receptor	Description
High	Residential properties (Class C3 use) and hotels (Class C1 use)
Medium	Offices (Class A2), Health care (Class C2) and educational and religious buildings buildings (Class D1 use)
Low	Commercial (Class B1(C)) and retail buildings (Class A1)

10.22 The magnitude of Impact shall be defined in accordance with recognised noise and vibration guidance and corresponding EIA terminology – High, Medium, Low, Very Low.

10.23 The relationship between the magnitude of impact and the receptor sensitivities is determined by the significance evaluation matrix shown in Table10.2.

Table10.2: Significance of effects

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

10.24 In terms of nature and scale of effects, effects will be defined as either adverse, beneficial or neutral in nature.

10.25 The scale of effects will refer to guidance within the Noise Policy Statement for England (NPSE), the decision making includes identifying whether the overall effect of the noise exposure generated by a development is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level. The definitions for the different effect levels are outlined below:

- Significant Observed Adverse Effect Level (SOAEL): The level of noise exposure above which significant adverse effects on health and quality of life occur;
- Lowest Observed Adverse Effect Level (LOAEL): The level of noise exposure above which adverse effects on health and quality of life can be detected; and
- No Observed Effect Level (NOEL): The level of noise exposure below which no effect at all on health or quality of life can be detected.

10.26 Typically, effects (either before or after mitigation) that are major or moderate in scale shall be considered as 'significant effects' i.e. exceeds the LOAEL. The exception to this will be temporary non-permanent sources where a moderate effect would be considered acceptable as it does not exceed the SOAEL.

Demolition, enabling and construction

10.27 The assessment of demolition, enabling and construction noise and vibration effects are described below:

10.28 Estimation of noise generated (impact magnitude) during each principal phase of the demolition, enabling and construction works and an assessment of the likely effects on surrounding sensitive receptors pre-mitigation. The assessment will be based on the "ABC" methodology set out in British Standard BS 5228:2009.

10.29 The corresponding noise levels for each magnitude of impact for the various receptors at the north site as per **Figure 10.1** are set out below.

10.30 The noise levels for NSP 1 are presented in Table 10.3.

Table 10.3: Description of the magnitude of impact rating for assessing the likely and residual effects of demolition and construction noise and vibration for NSP 1

Magnitude of Impact	Daytime noise levels (07:00-19:00)	Vibration Levels
Very low	Less than L_{Aeq} 55 dB[1]	Peak particle velocity (PPV) less than 0.3 mm/s
Low	Higher than ambient L_{Aeq} less than L_{Aeq} 60 dB	PPV regularly exceeding 0.3 mm/s, but less than 1.0 mm/s.
Medium	Higher than ambient and between L_{Aeq} 61-65 dB	PPV regularly exceeding 1.0 mm/s, but less than 10.0 mm/s.
High	Higher than ambient and greater than L_{Aeq} 65 dB	PPV regularly exceeding 10.0 mm/s.

10.31 [1]Based on ambient noise level threshold equal to $L_{Aeq,5min}$ 56 dB at the receptors and rounded as per the ABC methodology

10.32 The noise levels for NSP 2 are presented in Table 10.2.

Table 10.2: Description of the magnitude of impact rating for assessing the likely and residual effects of demolition and construction noise and vibration for NSP 2

Magnitude of Impact	Daytime noise levels (07:00-19:00)	Vibration Levels
Very low	Less than L_{Aeq} 75 dB[1]	Peak particle velocity (PPV) less than 0.3 mm/s
Low	Higher than ambient L_{Aeq} less than L_{Aeq} 80 dB	PPV regularly exceeding 0.3 mm/s, but less than 1.0 mm/s.
Medium	Higher than ambient and between L_{Aeq} 81-85 dB	PPV regularly exceeding 1.0 mm/s, but less than 10.0 mm/s.
High	Higher than ambient and greater than L_{Aeq} 85 dB	PPV regularly exceeding 10.0 mm/s.

10.33 [1]Based on ambient noise level threshold equal to $L_{Aeq,5min}$ 74 dB at the receptors and rounded as per the ABC methodology

10.34 The noise levels for NSP 3 and NSP 4 are presented in Table 10.3.

Table 10.3: Description of the magnitude of impact rating for assessing the likely and residual effects of demolition and construction noise and vibration for NSP 3 and NSP 4

Magnitude of Impact	Daytime noise levels (07:00-19:00)	Vibration Levels
Very low	Less than L_{Aeq} 70 dB[1]	Peak particle velocity (PPV) less than 0.3 mm/s
Low	Higher than ambient L_{Aeq} less than L_{Aeq} 75 dB	PPV regularly exceeding 0.3 mm/s, but less than 1.0 mm/s.
Medium	Higher than ambient and between L_{Aeq} 76-80 dB	PPV regularly exceeding 1.0 mm/s, but less than 10.0 mm/s.
High	Higher than ambient and greater than L_{Aeq} 80 dB	PPV regularly exceeding 10.0 mm/s.

10.35 [1]Based on ambient noise level threshold equal to $L_{Aeq,5min}$ 72 dB at the receptors and rounded as per the ABC methodology

The corresponding noise levels for each magnitude of impact for the various receptors at the south site as per **Figure 10.2** are set out below in

10.36 Table 10.4.

Table 10.4: Description of the magnitude of impact rating for assessing the likely and residual effects of demolition and construction noise and vibration for NSPs at the south site

Magnitude of Impact	Daytime noise levels (07:00-19:00)	Vibration Levels
Very low	Less than L_{Aeq} 60 dB[1]	Peak particle velocity (PPV) less than 0.3 mm/s
Low	Higher than ambient L_{Aeq} less than L_{Aeq} 65 dB	PPV regularly exceeding 0.3 mm/s, but less than 1.0 mm/s.
Medium	Higher than ambient and between L_{Aeq} 66-70 dB	PPV regularly exceeding 1.0 mm/s, but less than 10.0 mm/s.
High	Higher than ambient and greater than L_{Aeq} 70 dB	PPV regularly exceeding 10.0 mm/s.

10.37 [1]Based on ambient noise level threshold equal to $L_{Aeq,5min}$ 58 dB at the receptors and rounded as per the ABC methodology

- Road traffic associated with the demolition, enabling and construction works will be assessed using the same approach as for general increases in road traffic.
- Classification of the pre-mitigated nature, scale and significance of noise and vibration effects. Identification of appropriate Best Practicable Means mitigation / any other required mitigation and re classification of the residual effects (post mitigation) nature, scale and significance.
- Details of plant and equipment to be used throughout the enabling and construction works including percentage on times and sound power levels shall be presented within the ES.

Operational

10.38 The operational noise effects will be assessed with respect to the baseline measurements.

10.39 For the assessment of noise associated with road traffic, reference will be made to the Calculation of Road Traffic Noise (CRTN). Further advice is also given in the Design Manual for Roads and Bridges (DMRB) for road traffic noise assessment. Significance criteria for assessing the traffic noise are presented in Table 10.5, which is based on the IOA / IEMA 'Guidelines for Noise Impact Assessment.'

10.40 For the assessment of building services noise, reference will be made to the use of BS 4142:2014. Criteria for the assessment are set in accordance with BS 4142 and the Institute of Acoustics (IOA) / Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Noise Impact Assessment, as identified in Table 4.

10.41 For the assessment of commercial noise, reference will be made to DEFRA Noise from pubs and clubs report dated 2005. Criteria for the assessment are set in accordance with the Institute of Acoustics (IOA) / Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Noise Impact Assessment, as identified in Table 10.7.

Table 10.5: Description of the magnitude of impact rating for assessing the effect of increases due to operational noise

Magnitude of Impact	Increase in noise level (dBA)	Description
Very low	<1.0	Noise increase is unlikely to be discernible.
Low	1.0 - 2.9	A slight increase in noise levels may be perceived in affected buildings and outdoor recreational areas.
Medium	3.0 - 4.9	Increase in noise levels is likely to be noticeable in affected buildings and outdoor recreational areas.
High	>5.0	Increase in noise levels is likely to be clearly perceptible and could have a significant effect on the continued use of a building.

Cumulative Effects

10.42 A separate cumulative effects chapter will be presented at Chapter 12 of the ES. This will assess the cumulative impacts of the proposed development in conjunction with any committed developments within the vicinity of the sites as identified through the scoping process.

11. Socioeconomic

11.1 This section of the ES will present an assessment of the potential effects of the proposals on the existing socioeconomic conditions which will be identified through desk-based research. The approach proposed in this Scoping Report has been informed by published best practice guidance. The ES chapter and assessment will be prepared by Avison Young.

Site Context

11.2 As noted in Section 2, the Collyhurst Village site is located adjacent to Rochdale Road (A664), with distinct road boundaries on all sides, within the Harpurhey Ward. The South Collyhurst site is situated south of Whitley Road within the Miles Platting and Newton Heath Ward. Both of the sites are located within the administrative area of MCC.

11.3 The resident population of MCC was estimated to be 547,600 in 2018, of which 70.4% were aged 16-64.

11.4 The Indices of Multiple Deprivation use a combination of information relating to income, employment, education, health, skills and training, barriers to housing and services and crime to create an overall score of deprivation for local authorities, with 1 being the lowest rank and 319 being the highest rank. Manchester was ranked 2 out of 319 district local authorities in the Indices of Multiple Deprivation 2019.

11.5 The proportion of individuals classified as 'economically active' in Manchester between October 2018 and September 2019 was 71.7%, which was lower than the average across the North West (77.4%) and Great Britain (78.9%). The jobs density (i.e. the number of jobs divided by the individuals aged 16-64) within Manchester was 1.17 in 2018, which indicates a greater availability of employment opportunities compared with the regional (0.84) and national (0.86) averages. However, this is likely to mask disparities in employment opportunities across the administrative area of MCC, with the majority of jobs focussed in the City Centre. In Manchester, Services is the largest employment sector, with Wholesale and Retail Trade, Repair and Vehicles and Motorcycle the largest sub-sector of employment.

11.6 The Collyhurst Village site includes 28 residential units and a shop (the Collyhurst Village Store). There are currently no social infrastructure or community facilities within the sites. However, within 1 mile of the Collyhurst Village site there are 10 General Practitioner (GP) surgeries, 12 primary schools and three secondary schools. Within 1 mile of the South Collyhurst site there are nine GP surgeries, 12 primary schools and three secondary schools.

11.7 There are no formal amenity / open spaces within the sites. In the vicinity of the sites, there are open green spaces including Queen's Park to the north, Collyhurst Village Park and Rochdale Canal to the east and the River Irk valley to the west. The MCC's 'City Wide Open Spaces, Sport & Recreation Study' (2009) identifies that the facilities in the areas of the sites are of poorer quality than in other areas of Manchester and accessibility to these green spaces is an issue for local communities.

Planning Policy Context

National Planning Policy and Legislation

11.8 The NPPF sets out the Government's planning policies and how these are expected to be applied. Central to this framework is the presumption in favour of sustainable development; it is identified as "the golden thread running through both plan-making and decision-taking" (para 14). Three dimensions of sustainable development are defined by the NPPF in setting out the role of the planning system:

- Economic – the planning system is able to perform an economic role through supporting growth and innovation.
- Social – the planning system can perform a social role by supporting strong, vibrant and healthy communities. This includes providing the supply of housing required to meet the needs of present and future generations and through accessible local services that reflect the communities needs and support its health social and cultural well-being.
- Environmental – the planning system is able to perform an environmental role by protecting and enhancing the natural, built and historic environment.

11.9 NPPF notes that these roles are mutually dependent and so should not be undertaken in isolation: "to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system" (para 8).

11.10 Of particular relevance to the assessment of socio-economic benefits of the proposed development are the 'positive improvements' identified by the NPPF which the planning system should seek to achieve (para. 9): Making it easier for jobs to be created in cities, towns and villages; and Improving the conditions in which people live, work, travel and take leisure.

11.11 Economic sustainability is particularly relevant to the proposed development, this would support: Building a strong, competitive economy – the planning system is expected to encourage rather than impede sustainable growth and significant weight should be given to supporting economic growth. Planning policies should address barriers to investment including housing (para 21).

Local Planning Policy

MCC Core Strategy (2012)

11.12 MCC's Core Strategy is the key document in Manchester's Local Plan. The Strategy outlines the long-term strategic priorities for the unitary authority's future development and serves as the framework against which planning applications are assessed.

11.13 The relevant elements of the Strategy are identified below.

- Objective S03: Housing – The Strategy aims to provide a significant increase in high-quality housing provision at sustainable locations through the City. The objective's emphasis on high-quality housing includes creating sustainable lifetime neighbourhoods with high-quality environments, good local facilities and with easy access to employment opportunities.

- Policy CC3 – This policy states that the City Centre will see the most intensive development of housing in the City, at an expected minimum of 16,500 new units between 2012 and 2027. It cites key locations for residential location as Castlefield, Piccadilly, the Southern Gateway and the Northern Quarter.
- Policy H1: Overall Housing Provision – This policy states that between 2009 and 2027, approximately 60,000 homes will be delivered in the City. It adds that new housing will predominantly in the Region Centre and Inner Areas of Manchester, such as the City Centre.
- Policy H8: Affordable Housing – This policy states that all residential development on sites of 0.3 hectares and above or where the units proposed numbers 15 or higher will be subject to the requirement for affordable housing or an equivalent financial contribution. This policy states that new development will contribute to a 20% new housing provision to be affordable. The proportion of affordable housing units will reflect the type and size of the overall development. It adds that where appropriate, provision will be made within Section 106 agreements to amend the proportion of affordable housing considering economic conditions and subject to a financial viability assessment.

MCC's Northern Gateway Strategic Regeneration Framework (SRF) (2019)

11.14 The Northern Gateway SRF was published in 2019 and was developed with full regard to national planning policy, Manchester's statutory Development Plan and the suite of strategic and regeneration policies that are driving renaissance in the city.

11.15 The sites lie in the 'Collyhurst Village' and 'South Collyhurst' sub-areas of the Northern Gateway where the key opportunities relate to:

- The potential for low to mid-rise intensification with a mix of housing types and tenures appealing to various lifestyles and incomes;
- Provide a mix of high-quality family accommodation;
- Create outstanding public spaces and social infrastructure for existing and new residents;
- Enhance links to bus and Metrolink nodes;
- Prime Rochdale Road frontage creates an opportunity to support a higher density of residential development and strengthen the street edge; and
- Develop a strong Gateway at Queen's Road and rationalise the junction.

Greater Manchester Spatial Framework (GMSF)

11.16 The GMSF (Revised Draft 2019) focuses on identifying future housing and employment land requirement in the ten local authorities which form Greater Manchester up to 2035. Currently a draft, once endorsed it will act as the overarching development plan for Greater Manchester. The GMSF provides strategic context as well as detail around housing and employment land the associated infrastructure required.

11.17 The elements of the GMSF relevant to the socio-economic assessment are identified below.

- Strategic Objective 1 – seeks to increase the number of dwellings, including affordable homes and provide a diverse mix of housing;

- Strategic Objective 2 – seeks to create neighbourhoods of choice by prioritising the use of brownfield land and focussing new homes in the Core Growth Area and the town centres.
- Policy GM-H 1 – which sets out the aspiration to deliver 201,000 net additional dwellings in Greater Manchester over the period 2018-37 or an annual average of around 10,580.

11.18 Policy GM-H 3 – which seeks to incorporate a range of dwelling types and sizes to meet local needs and deliver more inclusive neighbourhoods.

Approach

11.19 Given the nature of the proposed development, the assessment will focus on:

- Economic effects, related to direct, indirect and induced job creation, increase in spending from the new community in the economy and displacement of existing businesses;
- Housing effects, related to the demolition of existing residential units and provision of housing stock; and
- Social infrastructure effects, including changes in demand for educational, healthcare and community facilities and open space.

11.20 The first stage of the assessment is to establish the baseline conditions for the sites through interrogation of published data or other sources for Manchester. This will include a review of local and national policies and strategies related to economic development and regeneration, which will be used to identify priorities at the local and national level. The existing economic and social conditions relevant to both of the sites will be established through reference to a number of published data sources such as Census data, the Office of National Statistics website, NOMIS, the Indices of Deprivation, Department of Education website, NHS website and MCC planning documents.

11.21 The baseline analysis will consider the following broad topics:

- Population;
- Deprivation;
- Employment;
- Economy;
- Housing;
- Education;
- Health;
- Community facilities; and
- Open / recreational space.

11.22 The second stage is to assess the socio-economic effects during both the construction and operational phases of the proposed developments. The impact assessment will utilise a range of different data sources including CLG guidance on labour ratios in the construction sector, HCA Employment Density Guide, and the HCA Additionality Guide.

11.23 During the construction stage, the key issues relate to the generation of construction-related employment at a local and regional level. This will consider both the direct employment effect and the indirect / induced effects associated with the supply chain and the impact of construction worker spend on local goods and services. In terms of operational stage effects, the key issues for assessment comprise the generation of direct, indirect and induced employment opportunities, increase in housing stock, changes in the demand for social infrastructure and additional spending from the new community.

Significance Criteria

11.24 There are no industry standard significance criteria for the assessment of socio-economic effects. The assessment will seek to quantify effects where possible. In circumstance where this is not possible, qualitative statements based on professional judgement will be made and justified.

11.25 The assessment will identify the sensitivity of each identified receptor. In a socio-economic assessment, receptors are not sensitive to changing environmental conditions in the same way as many environmental receptors are. To address this, the assessment will draw on a combination of measurable indicators and a consideration of the importance of the receptor in policy terms to gauge the receptor's sensitivity. For example, the number of jobs in an area may increase as new developments are completed and occupied by businesses. This is considered alongside the weight attached to these issues in local policy. For example, the Local Plan may have identified that growth in the stock of housing stock is a particular priority.

11.26 Table 11.1 below sets out the sensitivity criteria that will be used in the assessment.

Table 11.1: Criteria for Sensitivity

Sensitivity	Anticipated criteria
High	Evidence of direct and significant socio-economic challenges e.g. areas with levels of considerable unemployment / levels of economic inactivity. Accorded a high priority in local, regional, or national economic regeneration policy.
Medium	Some evidence of socio-economic challenges e.g. areas with levels of unemployment or levels of economic inactivity just above the national / regional averages. Change relating to the receptor has medium priority in local, regional, and national economic and regeneration policy.
Low	Little evidence of socio-economic challenges e.g. area with levels of unemployment or levels of economic inactivity in line with national / regional averages. The receptor is accorded a low priority in local, regional, and national economic and regeneration policy.
Negligible	No socio-economic issues relating to the receptor e.g. area of very limited unemployment or levels of economic inactivity (well below the national / regional averages).

Sensitivity	Anticipated criteria
	The receptor is not considered a priority in local, regional, and national economic development and regeneration policy.

11.27 The magnitude of impact upon each receptor will be determined by considering the predicted deviation from baseline conditions, both before and—if required—after mitigation. The criteria that will be used for the assessment of the magnitude of impact, which can be either positive (beneficial) or negative (adverse) is shown below in Table 11.2.

Table 11.2: Criteria for Magnitude of Impact

Magnitude of Impact	Description/Criteria
Substantial	Proposed Development would cause a large change to existing socio-economic conditions in terms of absolute and/or percentage change.
Moderate	Proposed Development would cause a moderate change to existing socio-economic conditions in terms of absolute and/or percentage change.
Minor	Proposed Development would cause a minor change to existing socio-economic conditions in terms of absolute and/or percentage change.
Negligible	No discernible change in baseline socio-economic conditions.

11.28 The significance of effect will be identified by combining the sensitivity of the receptor against the magnitude of impact, see the matrix shown in Table 11.3. Any effect that is moderate or above will be considered to be 'significant' (including for both adverse and beneficial impacts).

Table 11.3: Significance of Effect Assessment Matrix

Magnitude of Impact		Sensitivity of Receptor			
		High	**Medium**	**Low**	**Negligible**
	Substantial	Major	Major	Moderate	Negligible
	Moderate	Major	Moderate	Minor	Negligible
	Minor	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Cumulative Effects

11.29 A separate cumulative effects chapter will be presented at Chapter 12 of the ES. This will assess the cumulative impacts of the proposed development in conjunction with any committed developments within the vicinity of the sites as identified through the scoping process.

12. Non – Significant Issues

12.1 This section sets out those environmental issues deemed to be insignificant for the purposes of EIA, and as such have been 'scoped out' of the EIA process.

Ecology and Nature Conservation

12.2 There are a number of trees located on the Collyhurst Village site which will be removed as part of the proposed development. However, an Arboricultural Impact Assessment (AIA)will be undertaken which will recommend mitigation measures to ensure there are no significant adverse impacts.

12.3 A Phase 1 Habitat Survey will be submitted as a standalone report with each planning application. Significant effects on ecology are not anticipated and it is considered that ecology and nature conservation can be scoped out of the EIA.

Heritage and Archaeology

12.4 There are no designated heritage assets (Scheduled Monuments, Grade I, II* and II Listed Buildings, Conservation Areas, Registered Parks and Gardens or Registered Battlefields) within either of the site boundaries and limited heritage assets in the surrounding areas. As such it is not envisaged that there will be any significant impacts on heritage assets in the surrounding area.

12.5 Both sites have been previously developed. As such, any archaeological remains beneath the site will have been either removed, truncated or destroyed. As such the proposed development is not anticipated to have any additional impacts on unknown archaeological assets beneath the site.

12.6 Therefore, Heritage and Archaeology has been scoped out of the EIA.

Ground Conditions

12.7 The ground conditions on site shall be assessed and a Phase I Geo-Environmental Assessment shall be submitted as a standalone report with each planning application which shall identify any mitigation required. As parts of both sites are located within a Development High Risk zone, a Coal mining Risk Assessment will be undertaken at each site which will identify any mitigation which may be required. With regard to the former mine shafts adjacent to the South Collyhurst site, a remediation strategy will be prepared to ensure any risks are appropriately dealt with. It is not anticipated that there will be significant effects as a result of ground conditions on either site. As such, ground conditions has been scoped out of the EIA.

Flood Risk and Drainage

12.8 Both sites are located entirely within Flood Zone 1, indicating less than a 1 in 1,000 annual probability of flooding. The sites show isolated areas of Low to High risk however it is envisaged that this can be suitably managed through the implementation of a Drainage Strategy. A standalone Flood Risk Assessment (FRA) will be prepared for the Collyhurst Village site which will be submitted with the applications. As the South Collyhurst

site it less than 1ha in area and is not anticipated to impact flood risk elsewhere, in accordance with the NPPF, an FRA is not required to be submitted.

12.9 No significant impacts are anticipated and as such, Flood Risk and Drainage has been scoped out of the EIA.

Lighting

12.10 Artificial lighting is provided to encourage a safe environment for a range of activities including driving, cycling and walking. It is also used to enhance the environment by means of decorative and flood lighting of areas, features and buildings. Any new lighting proposed as part of the development at the sites will be in accordance with British Standards, The Institution of Lighting Professionals ('ILP') and The Chartered Institution of Building Services Engineers ('CIBSE') which prescribes required lighting levels. This would be referenced in Chapter 5: Description of the Development, within the ES. The proposed lighting will be selected with reference to the following design standards and codes of practice:

- BS EN 5489-1: 2003 +A2 (2008) Code of Practice for the design of road lighting: Part 1 Lighting of roads and public amenity areas;
- BS EN 13201-2: 2003 Road lighting – Part 2: Performance requirements;
- ILE GN01: Guidance notes for the reduction of obtrusive light;
- ILE TR12: Lighting of pedestrian crossings (2007); and
- ILE TR25: Lighting for traffic calming features.

12.11 Lighting will be designed in conjunction with the design team and landscape consultant to ensure that lighting is appropriate in terms of the potential effects on public realm and surroundings of the site. As this mitigation can be 'designed-in' to the proposals and secured through appropriate planning controls, it is considered that a detailed assessment of lighting is not required as part of the EIA.

Waste

12.12 Given the nature of the proposed development, materials required for the construction of the proposed development are unlikely to be particularly scarce or environmentally sensitive, nor is the proposed development likely to result in materials becoming scarce. Consideration will be given throughout the design process to the specification of suitable materials, including their sustainability and environmental implications, to support an environmentally sensitive and high-quality development. As a result, the proposed development is not likely to have any significant effects in relation to materials.

12.13 Waste will be generated during the construction phase, as a result of the construction of the new buildings. Waste management will be considered carefully throughout the design and construction of the proposed development, to ensure compliance with legislation, and to minimise costs associated with waste disposal. The volume of construction waste likely to be generated by the development would be in line with what would be expected from a development of this size and will not significantly affect the capacity of local waste infrastructure.

12.14 During the operation of the development, waste (including recyclables) generated by dwellings will be managed by the local waste authority, while waste from the commercial uses will be managed by commercial operators. None of the proposed users are anticipated to be major generators of waste and the wastes generated by the proposed development should not significantly affect the capacity of local waste infrastructure.

12.15 Following the implementation of standard mitigation measures including the adoption of a Site Waste Management Plan ('SWMP'), construction waste arisings can be reduced to a minimum such that it is not significant.

Climate Change

12.16 The climate change impacts associated with the proposals, and the subsequent requirement for adaptation and mitigation measures to increase the resilience to climate change events will be covered within the technical assessments scoped into the ES. Impacts associated with vehicle movements, emissions, dust and air quality associated with the site is anticipated to be low. Nevertheless, impacts will be covered within the transport and access and air quality chapters. Furthermore, the design of the scheme will ensure that climate change is taken into account and suitable drainage discharge rates will be proposed. Overall, any significant climate change impacts will be sufficiently considered and assessed within the technical chapters in the ES, setting out a series of mitigation measures to minimise climate change impacts. As such, climate change need not be assessed separately as part of this EIA.

Human Health

12.17 The EIA Regulations require that an ES considers the impact on human health of a proposed development. The nature of this proposed development is not considered to result in potential for direct health impacts to any nearby sensitive receptors (residents). Any potential impacts on highways, and subsequently on noise and air quality, as a result of the proposed developments that could give rise to indirect impacts on human health are expected to be mitigated appropriately to result in no significant residual effects and therefore no significant residual effect on human health. As such, assessment of impact on human health is not proposed to be included as part of this EIA.

Accidents and Disasters

12.18 The EIA Regulations 2017 require that an ES needs to include a description of the expected effects of the proposed developments on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters that are relevant to the projects concerned. In this case, the nature of the proposed developments are not considered to pose risk of major accidents and/or disasters. As such, accidents and disasters are not proposed to be included as part of this EIA.

13. Proposed Structure of the Environmental Statement

Volume 1: The Non-Technical Summary

13.1 A Non-Technical Summary is required under the 2017 EIA Regulations and presents the findings of the ES in a manner suitable for use by non-experts.

Volume 2: Environmental Statement

13.2 This Volume will contain the main text of the ES. The proposed topics for consideration and their respective chapter headings are set out below:

(1) Introduction

(2) Approach

(3) Site Description

(4) Alternatives

(5) The Proposed Development

(6) Planning Policy Context

(7) Townscape and Visual

(8) Transport and Access

(9) Air Quality

(10) Noise and Vibration

(11) Socioeconomics

(12) Cumulative Impacts

(13) Summary of Mitigation and Residual Effects

Volume 3: Appendices

13.3 This volume will contain supporting information and a collection of technical reports upon which the conclusions of the ES are based.

14. Summary and Conclusions

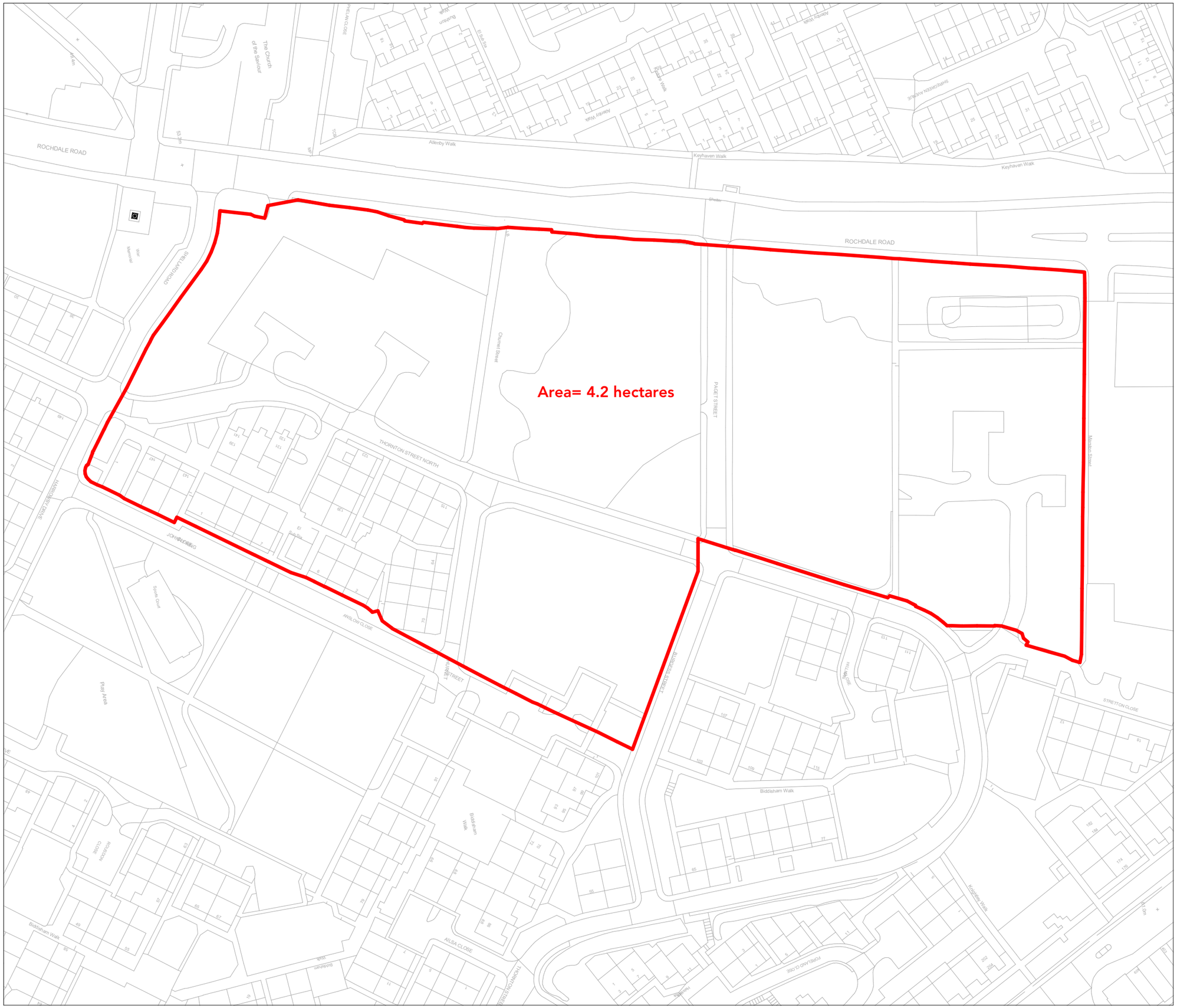
14.1 The Scoping Report has been prepared to support a formal request to MCC for a Scoping Opinion under the 2017 EIA Regulations regarding the scope of the EIA and the likely content of the ES which will accompany the Planning Application.

14.2 The Scoping Report provides:

- An overview of the baseline environmental conditions;
- Details of the proposed development;
- An overview of the likely environmental issues associated with the development; and
- Methodologies proposed to undertake the specialist assessments.

14.3 We would welcome feedback on the proposed approach to the EIA and would be grateful if MCC would respond by way of a formal Scoping Opinion within the requisite 5 weeks in accordance with Regulation 15(4) of the 2017 EIA Regulations. If the Local Planning Authority require any additional information in order to make a decision, please do not hesitate to contact Avison Young.

Appendix I
Collyhurst Village Site Location Plan



Note:
Do not scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

Site Boundary

Collyhurst Village	2.9 hectares
New Collyhurst Park	1.3 hectares
	4.2 hectares

N

Rev	Date	Intls	Details
P1	11/03/20		General Amendments

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Project Title	Collyhurst Housing
Client	FEC
Location	Manchester
Drawing Title	Existing Site Location Plan - Collyhurst Village

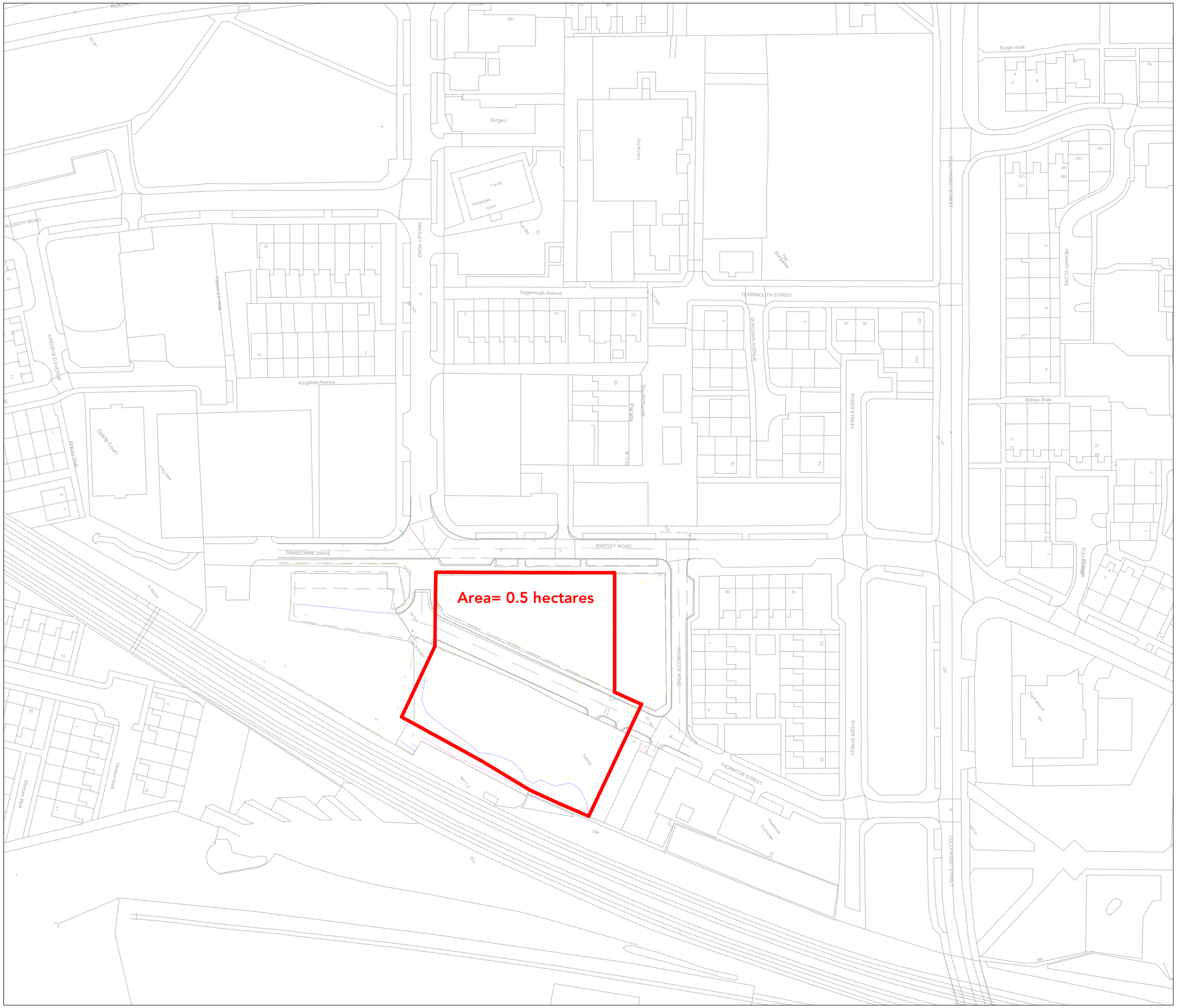
Date	11/03/2020 10:55:44	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project:	Origin:	Zone:	Level:	Type:	Disc:	Number:	Rev:

8871-BA-S1-XX-DR-A- (01)100- P1

Appendix II

South Collyhurst Site Location Plan



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Project Title	Collyhurst Housing
Client	FEC
Location	Manchester
Drawing Title	Existing Site Location Plan - South Collyhurst

Date	11/03/2020 10:55:56	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8871-BA-S2-XX-DR-A- (01)101- P1

Appendix III

Noise and Vibration Survey Report

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

19514-R01-A

10 January 2020

Collyhurst Redevelopment, Manchester Northern Gateway

Environmental noise and vibration survey report

London, Manchester, Edinburgh, Birmingham, Belfast, Stevenage

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Registered Office: 55 Charterhouse Street, London EC1M 6HA

Version	Date	Comments	Author	Reviewer
A	10 Jan 20		Kane Mitchell	Mark Howarth

Summary

Sandy Brown has been commissioned by Far East Consortium International Ltd to provide acoustic advice in relation to the proposed development at Collyhurst, Manchester.

An environmental noise survey has been carried out to determine the existing sound levels in the area. The daytime noise survey was carried out on 18 December 2019 and the night-time survey was carried out on 9 January 2020.

A vibration survey has been carried out to determine the existing vibration levels in the area. The vibration survey was carried out on 18 December 2019. Additional vibration measurements at the south site are proposed to assess vibration levels from freight trains.

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2 Site description 5
3 Noise survey method 8
4 Vibration survey method 10
5 Noise and vibration survey results 12
6 Conclusion 20
Appendix A 21
Survey details 21

1 Introduction

Sandy Brown has been commissioned by Far East Consortium International Ltd to provide acoustic advice in relation to the proposed development at Collyhurst, Manchester.

The proposed development comprises of two sites, one to the north adjacent to Rochdale Road and one to the south adjacent to Thornton Street.

The northern site will comprise of residential dwellings as well as commercial and community premises. The southern site will comprise solely of residential dwellings.

An environmental noise and vibration survey has been carried out, the purpose of which is to establish:

- Background noise levels around the sites
- Ambient noise levels around the sites
- Vibration levels in the area of the sites

This report presents the survey method and results for the above.

2 Site description

2.1 The site and its surrounding

The north site location in relation to its surroundings is shown in Figure 2. An excerpt of the proposed development plan is presented in Figure 1 for context.

The south site location in relation to its surroundings is shown in Figure 4. An excerpt of the proposed development plan is presented in Figure 3 for context.

Figure 1 Excerpt of the proposed northern development plan

Figure 2 Aerial view of north site (courtesy of Google Earth Pro)

Figure 3 Excerpt of the proposed southern development plan

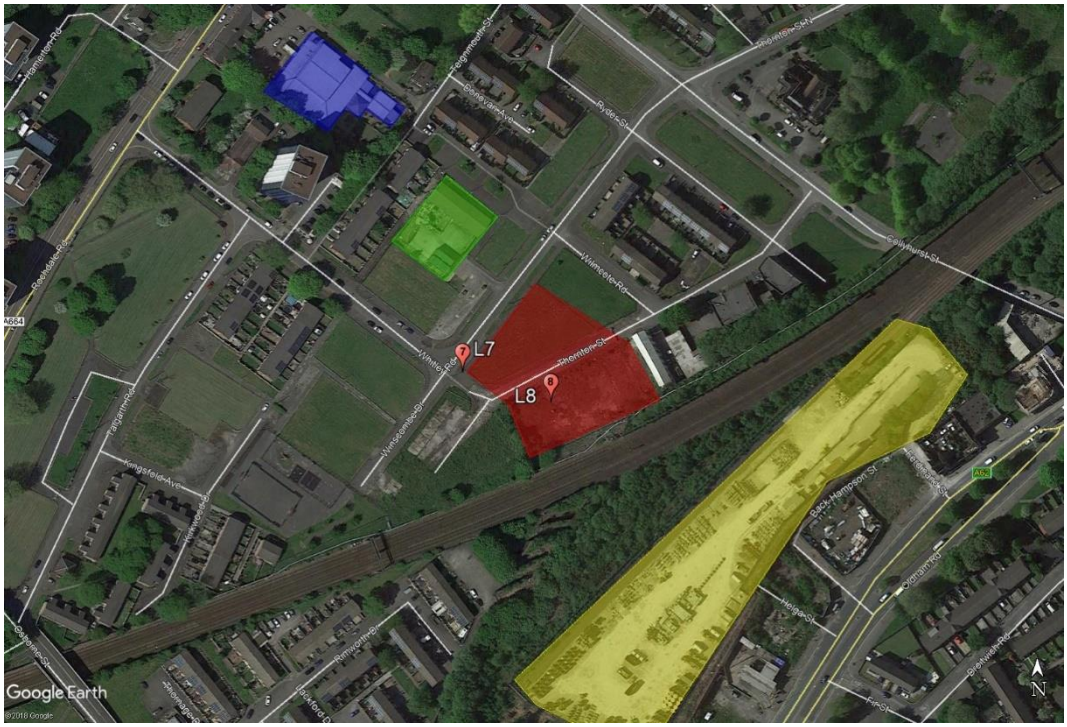

Figure 4 Aerial view of south site (courtesy of Google Earth Pro)

2.2 Adjacent premises

2.2.1 North site

The site is predominantly bounded by residential premises. To the east of the site is Queens Road and to the west is Rochdale Road.

Approximately 90 m to the north of the site is the tram line between Manchester city centre and Rochdale town centre.

Approximately 200 m to the north west of the site is North Manchester radio broadcasting centre.

Approximately 80 m to the south west of the site is the Church of the Saviour church and school. These are highlighted in green in Figure 2.

2.2.2 South site

Directly to the south of the south site is the main train line between Manchester Victoria and Leeds.

Further to the south is the Collyhurst Network Rail compound. This is highlighted in yellow within Figure 4. During the survey, no noise was observed coming from the compound. It is possible that this compound produces high noise levels when in use. Usage and operational hours of the yard should be checked.

Approximately 100 m to the north west of the site is Collyhurst Youth Centre. This is highlighted in green within Figure 4. Further to the north west is Collyhurst Nursey school and is highlighted in blue.

3 Noise survey method

The survey included unattended and attended noise measurements.

3.1 Attended measurements

Attended sample measurements were taken by Kane Mitchell and Thomas Dent at 7 locations around the sites. These are indicated in Figure 2 as location ‘L1’ to ‘L6’ for the north site and as location ‘L7’ within Figure 4 for the south site.

The attended measurements were carried out on 18 December 2019 during the daytime and on 9 January 2020 during the night-time. All measurements were carried out over 5-minute periods.

Daytime noise measurements were carried out at the north site at location ‘L2’ for a 3 hour duration. The purpose of these measurements was to assess noise levels from traffic along Rochdale Road.

For all attended noise measurements, the microphone was mounted on a tripod approximately 1.5 m above the ground level and at least 1 m from any other reflective surface. Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

Attended measurement positions 'L1 – L6' for the north site are shown within Figure 5.

Figure 5 Attended measurement locations 'L1' - 'L6'

A photograph of the south site attended measurement location ‘L7’ is provided within Figure 6.

Figure 6 Attended measurement locations 'L7'

3.2 Weather conditions

Weather conditions during the surveys are described in Appendix A.

4 Vibration survey method

Vibration measurements were taken at location ‘L4’ at the north site as per Figure 2 and at ‘L8’ at the south site as per Figure 4.

The measurements were taken on 18 December 2019 by Kane Mitchell and Thomas Dent. Measurement periods containing multiple events were obtained during the survey.

Vibration time histories were recorded using a tri-axial accelerometer and data recorder. The accelerometers were arranged on a mounting block that was connected to a solid ground surface. A metal washer was fixed to the slab using a thin layer of epoxy adhesive with the mounting block attached to the washer.

The north site vibration measurements were conducted in three axes as follows at ‘L4’:

- X-axis – Horizontal vibration perpendicular to Rochdale Road
- Y-axis – Horizontal vibration parallel to Rochdale road
- Z-axis – Vertical vibration

A photograph showing this measurement position is presented within Figure 7.

Figure 7 North site vibration measurements location 'L4'

The south site vibration measurements were conducted in three axes as follows at ‘L8’:

- X-axis – Horizontal vibration perpendicular to the train line
- Y-axis – Horizontal vibration parallel to the train line
- Z-axis – Vertical vibration

A photograph showing this measurement position is presented within Figure 8.

Figure 8 South site vibration measurements location 'L8'

Details of the equipment used and the noise indices measured are provided in Appendix A.

The vibration measurements taken are considered to be reasonably representative of the vibration levels to be experienced by the proposed developments.

At location 'L8' additional measurements will need to be taken in order to assess vibration resulting from freight trains, as our current measurements only measure vibration from commuter trains.

5 Noise and vibration survey results

5.1 Observations

5.1.1 North site

The dominant noise source occurring during the measurements at locations 'L1', 'L2' and 'L3' was traffic noise from Rochdale Road.

At locations 'L4' and 'L5' the dominant noise source was traffic noise from Queens Road.

Less significant noise sources were passing pedestrians and bird song.

5.1.2 South site

The dominant noise source occurring during the measurements at location 'L7' was traffic noise from Whitley Road and noise from passing trains.

Less significant noise sources were dogs barking and passing pedestrians.

5.2 Noise measurement results

This section provides a summary of the daytime and night-time noise levels measured during the attended measurements at both the north and south sites.

All measurements undertaken are considered to be free field.

5.2.1 Attended measurement results at north site - Location 'L2'

Noise levels recorded during the continuous attended measurements at location 'L2' are summarised in Table 1.

The dominant noise source during these measurements was constant traffic passing along Rochdale Road. Max noise levels were the result of car horns and passing HGVs/buses. Train horns were also clearly audible however these were infrequent, occurring approximately every 15 minutes.

Table 1 Noise levels and key noise sources from attended measurements at the north site (L2)

Location	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
2	11:00	71	77	60
2	11:05	73	93	61
2	11:10	71	78	60
2	11:15	72	88	61
2	11:20	71	82	58
2	11:25	72	91	61
2	11:30	71	77	63
2	11:35	71	80	62
2	11:40	71	78	62
2	11:45	71	78	61
2	11:50	71	78	63
2	11:55	72	91	61
2	12:00	71	79	62
2	12:05	70	77	58
2	12:10	71	80	61
2	12:15	71	80	63
2	12:20	72	79	62
2	12:25	70	78	60
2	12:30	71	78	62
2	12:35	71	77	63
2	12:40	70	78	58
2	12:45	71	78	62
2	12:50	71	79	61
2	12:55	72	77	63

Location	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
2	13:00	71	81	63
2	13:05	71	82	61
2	13:10	71	79	61
2	13:15	70	77	57
2	13:20	72	77	66
2	13:25	71	79	62
2	13:30	72	80	65
2	13:35	72	79	67
2	13:40	70	77	58
2	13:45	71	77	64
2	13:50	71	78	63
2	13:55	71	78	61

5.2.2 Attended measurement results at north site elsewhere

Daytime noise levels and key sources recorded during the attended measurements at the north site at locations 'L1' and 'L3-L6' are summarised in Table 2.

Table 2 Daytime noise levels and key noise sources from attended measurements at the north site

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	11:55	74	89	63	Traffic noise from Rochdale Road. Maxes resulting from passing HVGs and buses.
1	12:00	73	83	61	
1	12:05	71	84	59	
1	13:15	72	81	58	
1	13:20	71	80	62	
1	13:25	72	82	61	

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
3	11:00	59	78	53	Traffic noise from Rochdale Road.
3	11:05	58	75	52	Maxes resulting from passing vehicles and train horns
3	11:10	55	67	51	
3	12:20	54	68	52	
3	12:25	53	58	51	
3	12:30	54	64	52	
4	11:20	56	75	53	Traffic noise from Rochdale Road.
4	11:25	56	76	53	Maxes resulting from passing vehicles and train horns
4	11:30	59	79	54	
4	12:40	57	74	54	Traffic noise from Rochdale Road.
4	12:45	56	71	54	Maxes resulting from passing vehicles
4	12:50	55	69	54	
5	11:35	72	81	59	Traffic noise from Queens Road.
5	11:40	75	86	66	Maxes resulting from sirens of passing emergency vehicles
5	11:45	78	103	66	
5	12:55	72	89	63	Traffic noise from Queens Road.
5	13:00	71	79	63	Maxes resulting from sirens of passing emergency vehicles and HGVs
5	13:05	73	88	61	
6	14:05	57	74	50	Traffic noise from Collyhurst Road,
6	14:10	56	71	50	Maxes resulting from tram passes.

Night-time noise levels and key sources recorded during the attended measurements at the north site at locations 'L1' and 'L3-L6' are summarised in Table 3

Table 3 Daytime noise levels and key noise sources from attended measurements at the north site

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	23:25	66	82	50	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing buses. Occasional faint car horns from Queens Road.
1	23:30	67	81	47	
1	23:35	66	81	49	
1	00:25	63	77	47	
1	00:30	65	80	50	
1	00:35	64	77	51	
2	23:45	65	76	46	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing buses. Occasional passing cars with music playing loudly.
2	23:50	64	76	47	
2	23:55	64	77	45	
2	00:05	65	78	47	
2	00:10	66	79	48	
2	00:15	65	78	46	
3	00:05	50	61	45	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing vehicles along Thornton Street. Max noise level at 23:55 resulting from a passing vehicle playing loud music.
3	00:10	49	58	43	
3	00:15	48	60	41	
3	23:45	49	57	44	
3	23:50	48	56	42	
3	23:55	54	78	42	

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
4	00:25	47	70	42	Intermittent traffic noise predominantly from Rochdale Road.
4	00:30	46	60	42	
4	00:35	46	59	40	Maxes resulting from vehicles passing along both Rochdale Road and Queens Road.
4	23:05	49	52	47	
4	23:10	48	55	46	Max noise level at 00:25 resulting from a vehicle passing along Stretton Close.
4	23:15	49	65	45	
5	00:40	66	84	42	Intermittent traffic noise along Queens Road.
5	00:45	68	86	44	Maxes resulting from passing buses and HGVs.
5	00:50	68	83	43	
5	23:25	69	81	51	Tram passes also audible, occurring once approximately every 10 minutes.
5	23:30	69	80	45	
5	23:35	67	80	46	
6	23:05	48	61	45	Intermittent traffic noise along Collyhurst Road.
6	23:10	56	84	45	Maxes resulting from tram passes which occurred approximately once every 10 minutes.
6	23:15	47	62	44	
6	00:45	48	63	40	
6	00:50	47	56	44	
6	00:55	47	65	39	

5.2.3 Attended measurement results at south site

The daytime noise levels and key sources recorded during the attended measurements at the south site are summarised in Table 4.

Table 4 Daytime noise levels and key noise sources from attended measurements at the south site

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
7	16:20	58	68	51	Traffic noise from Whitley Road and intermittent passing trains.
7	16:25	59	74	52	
7	16:30	57	70	53	

The night-time noise levels and key sources recorded during the attended measurements at the south site are summarised in Table 5. During all the measurements, there was intermitted traffic noise from Whitley Road. Specific noise events have therefore been noted.

Table 5 Night-time noise levels and key noise sources from attended measurements at the south site

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
7	01:15	48	63	40	1 x train pass
7	01:20	44	55	38	0 x train passes Helicopter flying overhead
7	01:25	43	60	38	1 x train pass
7	01:30	44	58	38	1 x train pass
7	01:35	41	55	36	0 x train passes
7	01:40	53	68	34	1 x train pass

5.3 Vibration measurement results

5.3.1 North site

VDVs were also measured at location '1' as per Figure 2 and are presented in Table 6. The maximum VDVs measured for each of the directions are highlighted in red.

Table 6 VDVs measured at north site at location 'L4'

Start time	Duration (min)	Number of events	VDV ($m/s^{1.75}$)		
			X	Y	Z
14:55	15	N/A	0.033406	0.008295	0.003998
15:10	15	N/A	0.038807	0.008402	0.004031
15:25	15	N/A	0.041115	0.010918	0.004515
15:40	15	N/A	0.045757	0.011448	0.004429

5.3.2 South site

VDVs were also measured at location 'L1' as per Figure 2 and are presented in Table 6. The maximum VDVs measured for each of the directions are highlighted in red.

Table 7 VDVs measured at south site at location 'L8'

Start time	Duration (min)	Number of events	VDV ($m/s^{1.75}$)		
			X	Y	Z
16:10	5	5	0.021484	0.005111	0.003173
16:15	5	3	0.023036	0.005099	0.004405
16:30	5	0	0.028414	0.006299	0.002517
16:35	5	1	0.029715	0.006307	0.002991
16:40	5	2	0.027391	0.005772	0.004556
16:45	5	2	0.030744	0.007556	0.002961
16:50	5	0	0.033881	0.007235	0.003264
16:55	5	5	0.033646	0.006169	0.004449
17:00	5	2	0.031356	0.006639	0.002854

6 Conclusion

An environmental noise and vibration survey has been carried out at both the north and south sites.

A detailed acoustic planning report providing necessary recommendations according to the guidelines set out by the Manchester City Council will be provided in due course.

This report will include details on the following:

- External noise levels around the proposed development
- Facade sound insulation requirements
- Recommendations on facade construction and ventilation strategy
- An assessment of tactile vibration and re-radiated noise from ground-borne noise.

Appendix A

Survey details

Equipment

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Calibration information

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Data Recorder	DA-20/10870889	Rion	11 Sep 21	TCRT19/1712
Accelerometer	PV-87/33827	Rion	10 Sep 21	TCRT19/1708
Accelerometer	PV-87/74274	Rion	9 Dec 21	TCRT19/1707
Accelerometer	PV-87/33829	Rion	9 Sep 21	TCRT19/1706
Vibration Calibrator	AT01/3015	AP Technology	10 Sep 21	TCRT19/1709
Sound level meter	2250/3011964	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Microphone	4189/3100176	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Pre-amp	ZC0032/26376	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Calibrator	4231/3019123	Brüel & Kjær	3 Sep 21	UCRT19/1969
Sound level meter	NL-52/00932326	Rion	13 Mar 21	TCRT19/1179
Microphone	UC-59/05549	Rion	13 Mar 21	TCRT19/1179
Pre-amp	NH-25/32354	Rion	13 Mar 21	TCRT19/1179
Calibrator	NC-74/34125432	Rion	13 Mar 21	TCRT19/1178

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred.

These weather conditions are considered suitable for obtaining representative measurements.

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20 April 2020

Our reference: JA/DMN

Dear Mr Wilks

TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 ("THE EIA REGULATIONS")

SCOPING REQUEST UNDER PART 4 REGULATION 15(1)

'COLLYHURST VILLAGE' MANCHESTER ("THE PROPOSED DEVELOPMENT")

SCOPING OPINION OF MANCHESTER CITY COUNCIL PURSUANT TO REGULATION 15

Thank you for your request dated 13 March 2020 for a scoping opinion at the above site and your agreement to an extension of time until 20 April 2020.

In coming to a formal opinion on the scope of the Environmental Statement ("ES") , Manchester City Council, as Local Planning Authority, has considered the supporting information contained within your '*EIA Scoping Report – Proposed Residential Development Collyhurst Manchester March 2020'* prepared by yourselves, on behalf of the Applicant Far East Consortium Limited (FEC), and the comments from statutory consultees.

I have now had a chance to consider your scoping request and I outline my response below.

The Proposed Development is considered an EIA development as it falls within the description and thresholds in Schedule 2 10(b) of the EIA Regulations as an 'Infrastructure Project - Urban Development Project' which has the potential to have significant effects on the environment. In accordance with Schedule 2, Categories 10(b) (urban development projects) of the EIA Regulations and owing to the location, scale and nature and of the Proposed Development, I note that you recognise the need for an EIA and have therefore submitted the scoping report for consideration to the City Council, as Local Planning Authority.

Before adopting a Scoping Opinion the City Council, as Local Planning Authority, must take into account the information specified in Regulation 15(6) of the EIA Regulations.

(a) any information provided by the applicant about the proposed development;

(b) the specific characteristics of the particular development;

(c) the specific characteristics of development of the type concerned; and

(d) the environmental features likely to be significantly affected by the development.

This Scoping Opinion sets out the information that the City Council, as Local Planning Authority, considers should be included in the ES that will be submitted with the subsequent planning application made in respect of the Proposed Development.

In formulating this Scoping Opinion the City Council, as Local Planning Authority, has taken account of, the requirements of the EIA Regulations, the nature and scale of the Proposed Development, the nature of the receiving environment, current best practice in the preparation of environmental statements, and the views expressed by the organisations and bodies that responded to the consultation.

This Scoping Opinion should not be construed as implying that the City Council, as Local Planning Authority, agrees with the conclusions set out in the Scoping Request regrading impacts of the proposal. This Scoping Opinion is without prejudice to any decisions subsequently taken in respect of any planning application submitted in respect of the Proposed Development.

Your report of the 13 March 2020 sets out the proposed chapters that the ES will cover, and the disciplines which you believe should be scoped in and out of the EIA.

These are as follows:

Scoped In

- Townscape and visual;
- Transport and access;
- Air Quality and dust;
- Noise and Vibration; and
- Socio-economic.

Scoped out

- Ecology and nature conservation;
- Heritage and archaeology;
- Ground conditions'
- Flood risk and drainage;
- Lighting;
- Waste;
- Climate change;

- Human Health; and
- Accidents and disasters.

Below is a consideration of the scoping report for the Proposed Development and comments on the approach which you have outlined.

CONSULTATIONS

Regulation 15 (4) of the EIA Regulations require the City Council, as Local Planning Authority, to consult consultation bodies prior to adopting a Scoping Opinion.

Having regard to Regulation 2 of the EIA Regulations, the following consultees were consulted who have specific environmental responsibilities and which the City Council, as Local Planning Authority, considers are likely to have an interest in the development proposal.

- Natural England;
- Environment Agency;
- Greater Manchester Ecology Unit (GMEU);
- Greater Manchester Archaeology Advisory Service (GMAAS);
- Transport for Greater Manchester (TfGM);
- United Utilities;
- City Council Highway Services;
- City Council Environmental Health;
- City Council Flood Risk Management;
- City Council Arborist;
- City Council works and skills;
- Coal Authority;
- Design for Security at Greater Manchester Police.

All responses of the consultees contacted by the City Council, as Local Planning Authority, during the EIA scoping process are appended to this letter.

You are strongly recommended to consult further with consultees as appropriate throughout the EIA process as the development proposal evolves. It is thereby recommended all consultee responses are reviewed by you and the applicant in full.

Any subsequent ES submitted with a planning application should reflect the points raised by the consultation bodies where this reflects the requirements of the Regulations. It is recommended that the ES summarises the scoping responses from the consultation bodies and how they are, or are not, addressed in this regard. Any consultation responses received after the date of this letter, that have not been taken into account within this Scoping Opinion, will be forwarded to you and should be given due consideration in the planning application and EIA process.

CONTEXT

The development site consist of two neighbourhood areas within the Northern Gateway Strategic Regeneration Framework (SRF):

- Collyhurst Village; and
- South Collyhurst.

Collyhurst Village

Collyhurst Village is approximately 4.2 hectares and is bounded by Rochdale Road to the west, a footpath, woodland and a car dealership to the north, Anslow Close, Chrunet Street and Thornton Street North to the east and Shellard Road to the south. Paget Street bisects the centre of the site in an east/west orientation. The development site is located within the Harpurhey ward.

The site is irregular in shape and currently comprises 28 residential dwellings, a shop, and areas of hardstanding, amenity grassland and trees.

The surrounding area is predominately residential in nature comprising of two storey terrace and semi-detached properties. A war memorial lies adjacent to the development site on its southwestern border.

In terms of accessibility, Rochdale Road provide a key walking, cycle road link into the city centre and towards north Manchester. Monsall Metrolink stop is located approximately 470 metres northeast of the site whilst Manchester Victoria Railway Station is approximately 1.7 km south of the development site.

Collyhurst South

Collyhurst South is approximately 0.5 hectares and is bounded by Whitley Road to the northwest, hardstanding and amenity grassland to the west, the railways to the south and grassland and a warehouse building to the east. Winscombe Drive Bisects the centre of the site in a southwest/northeast orientation. The development site is located within the Miles Platting Newton Health ward.

The site is irregular in shape and currently comprises amenity grassland, unmanaged grassland, scrub vegetation, trees, a road and hardstanding.

Whilst the surrounding area is predominately residential in nature, there are a number of future development sites which are currently laid out as amenity grassland. There is also a small children's play area.

In terms of accessibility, Queens Road Metrolink stop is located approximately 920 metres northwest of the site whilst Manchester Victoria Railway Station is approximately 1.7 km south of the development site.

Both areas are a long term regeneration priorities for the City Council where it seeks introduce new homes and other amenities in order to create a thriving neighbourhood.

SENSITIVE RECEPTORS

Collyhurst Village

The western extent of the development site is located within the Greater Manchester Combined Air Quality Management Area (AQMA) due to its proximity to Rochdale Road which is a major road connecting to the City Centre.

The site is not within, nor does it contain, any ecological designations including sites of specific interest (SSSI), sites of biological importance (SB1) or special protection areas (SPA). The Rochdale Canal which lies approximately 3.4 km North West of the development site and is a site of Special Scientific Interest (SSSI) and special area of conservation.

Moston Brook is culverted beneath Thornton Street to the east as well as beneath the northern extent of the site. Moston Brook is a tributary of the River Irk (located approximately 240 metres west of the site). Both Moston Brook and the River Irk are designated as a main river.

The site is located within Flood Zone 1 'a low probability of flooding' and is situated within the Manchester, Salford and Trafford Critical Drainage Area (CDA).

There is historical coal mining activity recorded in the area with the southern border of the development site encroaching into a development high risk zone.

The development site is not located within a conservation area and there are no listed buildings on the site. There is one listed building within 500m of the development site, Grade II Listed Brierley Statue in Queens Park to the west of the park entrance. The Grade II Listed Queens Road Park is located approximately 290 metres north of the site.

Residential properties dominate the immediate context to the development site consisting of low rise residential homes.

South Collyhurst

The development site is not located within the Greater Manchester Combined Air Quality Management Area (AQMA). Rochdale Road and Oldham Road which are 170 metres northwest and 120 southeast respectively are due to them being major roads connecting to the city centre.

The site is not within, nor does it contain, any ecological designations including sites of specific interest (SSSI), sites of biological importance (SB1) or special protection areas (SPA). The Rochdale Canal which lies approximately 3.7 km north west of the development site and is a site of Special Scientific Interest (SSSI) and special area of conservation.

There are no watercourse on or near to the development site. The nearest watercourse is the River Irk, located approximately 560 m west of the site.

The site is located within Flood Zone 1 'a low probability of flooding' and is situated within the Manchester, Salford and Trafford Critical Drainage Area (CDA).

There is historical coal mining activity recorded in the area within the development high risk zone. Former mine entries are located adjacent to the north eastern boundary.

The development site is not located within a conservation area and there are no listed buildings on the site. There is one listed building within 500m of the development site,

Grade II Listed Brierley Statue in Queens Park to the west of the park entrance. The Grade II Listed Queens Road Park is located approximately 290 metres north of the site.

Residential properties dominate the immediate context to the development site consisting of low rise residential homes.

PROPOSED DEVELOPMENT

I note from your scoping report that the Proposed Development is still at the feasibility stage of development and the final design, mix of uses and number of new homes has not yet been finalised. The scoping report is therefore submitted based on a number of parameters. Should these parameters change, then a further scoping assessment should be undertaken if the scope of the ES needs to reflect this.

The Proposed Development for Collyhurst Village will consists of the construction of approximately 300 new homes including a mix of townhouses and mid-rise (up to 6 storey) apartment buildings. A percentage of the new homes will be affordable.

The Proposed Development for Collyhurst South with consist of approximately 30 new homes comprising townhouses with the intention of them being affordable homes.

I also note it is envisaged that the Proposed Development within each neighbourhood area would accommodate car parking, amenity space, landscaping public realm and boundary treatment.

ASSESSMENT OF THE SCOPING REPORT

I can confirm that the approach outlined within the Scoping Report is considered to be generally acceptable, appropriate and proportionate. This is also reflected in the nature of the consultation responses.

You should note the specific points I have made below within the specific discipline areas which reflect the comments of the consultees and those of the City Council, as Local Planning Authority. These matters should also be included and addressed within the relevant chapters of ES.

Discussion of alternatives

Paragraph (3)(d) of Regulation 18, and paragraph 2 of Schedule 4 of the EIA Regulations, require that environmental statements include discussion description of the reasonable alternatives to the Proposed Development and an indication of the main reasons for the option chosen, that have been considered by the applicant.

I note within section 5 of your Scoping Request that you intend to provide a discussion on alternatives within the ES. This will focus on alternative layout and design arrangements at the development sites, why these were dismissed and the preferred design option selected. It is noted that there will be no discussion alternative sites. However, it must be made clear with regards to the locational requirements for this scheme in this area as part of the wider regeneration aspirations for the Northern Gateway.

Presentation and content of the Environmental Statement

The purpose of an ES is to enable significant environmental impacts of a proposed development to be fully considered before an application for planning consent is determined.

The ES provides environmental information to aid the decision making process. The ES should be laid out clearly, with minimum use of technical terms (where appropriate) and should provide an objective and realistic description of the likely significant impacts of the proposed development.

The information should be presented so as to be comprehensible to the specialist and non-specialist alike. The ES should be concise with supporting technical information placed in appendices

Mitigation

Paragraph 7 of Schedule 4 of the EIA Regulations states that mitigation measures may fall into a range of categories namely:

- avoidance of impacts;
- reduction in the magnitude of impacts; or
- compensation for losses incurred through unavoidable impacts;

These should identified as such in the technical chapters of the ES.

Mitigation measures should not be developed in isolation, as they may relate to more than one aspect of the environment (e.g. mitigation to address issues of landscaping, surface water management, air quality and biodiversity).

The ES should set out the mitigation measures required to prevent, reduce and where possible offset any significant adverse effects. The ES should also identify any residual effects that could be expected to persist even with mitigation in place.

The anticipated effectiveness of any mitigation measures proposed should be addressed within the ES. Only mitigation measures that can be shown to be deliverable (i.e. technically and financially viable), and for which the applicant can deliver and implement as part of any planning permission granted, should be taken into account as part of the assessment.

It is further recommended that a section is included in the ES in which the mitigation measures proposed across all the technical chapters are collated, and presented as an integrated package.

It is considered best practice to outline in the ES, the structure of the environmental management and monitoring plan.

Cumulative effects

The following additional sites should be considered as part of the cumulative impacts:

Miles Platting:

121401/FO/2018: Erection of 57 properties with a mix of two and three storey semi-detached / terraced properties and six apartments in one block with associated road access, parking and landscaping at Land Adjacent To Bourdon Street Holland Street Manchester M40 7DB **Approved**

123735/FO/2019: Erection of 13 residential properties with a mix of two and three storey semi-detached / terraced properties with associated road access, parking, landscaping and boundary treatment at Land Bound By Bradford Road And Butler Street Manchester M40 7FB **Approved**

123887/FO/2019: Erection of 37 dwellinghouses with a mix of two and three storey semi-detached / terraced properties with associated road access, parking and landscaping at Land Off Woodward Street Manchester M4 7JW **Approved**

124738/FO/2019: Erection of 10 dwellinghouses (Class C3) comprising a mix of two and three storey semi-detached / terraced properties with associated access, parking and landscaping at Land Bound By Eastleigh Drive And Naylor Street Manchester M40 7HS **Approved**

125927/FO/2020: Erection of 22, two and three storey residential dwellinghouses (C3a) with associated landscaping, car parking, boundary treatment and other associated works at Land At Bothwell Road Bothwell Road Manchester **Approved**

126467/FO/2020: Erection of 22 two and three storey dwellinghouses (Use Class C3a) with associated access, car parking, boundary treatment and landscaping at Land Bounded By New Allen Street, Oldham Road And William Chadwick Close Manchester **Pending Consideration**

Cross references and summarising of the findings

All specialist chapters should be cross-referenced to other relevant disciplines (for example traffic impacts on air quality). Consideration of the potential for interactions between the different aspects of the environment is essential to the production of a robust assessment.

The ES should not be a collection of separate specialist chapters, but a comprehensive assessment of the environmental impacts of the proposed components of the wider scheme, and should account for how the identified impacts could be mitigated or avoided, or how suitable compensation could be provided to offset those effects.

In accordance with the requirements of paragraph 6 of Schedule 4 of the EIA Regulations, each technical chapter should include a description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of any difficulties (e.g. technical deficiencies, lack of know-how, etc.) encountered by the applicant during the preparation of the ES and the main uncertainties involved.

ENVIRONMENTAL MATTERS TO BE SCOPED OUT OF THE ES

The City Council comments as follows, based on the information provided, on the matters proposed to be scoped out of the ES.

Ecology and nature conservation

The impact on ecology is considered to be of no more than local significance. The protected species interest in the development site is low with the main impacts being the loss of trees and habitats. I accept that an ecological assessment is capable of being scoped out of the ES and can instead form part of the supporting documents to the planning application.

In particular, the following reports should be prepared:

- Surveys for habitats (extended Phase 1 habitat surveys or UK habitat classification surveys)
- Bat activity surveys and assessment of trees for bat roost potential
- A requirement to aim for a net gain in biodiversity to result from the development

- A survey for invasive plant species and a method statement providing details about how invasive plants are to be controlled during the course of any approved development

The above should also be set within the context of the wider Northern Gateway Proposals.

Heritage and archaeology

The scoping report concludes any archaeological remains beneath the site will have been either removed, truncated or destroyed. As a result, there will be no significant effects which would require consideration by an EIA. I confirm that archaeology can be scoped out of the ES provided the planning application is supported by an appropriate report which supports these conclusions.

With regards to Heritage assets, it is noted that there are no heritage assets within the development site and that there are limited assets in the surrounding area. As such, it is not anticipated to be any significant impacts which will require consideration by an EIA. I accept that heritage can be scoped out of the ES, however, the planning application should be supported by an appropriate heritage assessment which includes mitigation should this be required.

The war memorial should be given due regard and consideration within the heritage assessment.

Ground conditions

The scoping report concludes that, with the exception of the previous coal mining activity, there is nothing unusual or complex about the ground conditions at the Proposed Development sites. As a result, there will be no significant effects which would require consideration by an EIA. I confirm that ground conditions can be scoped out of the ES provided the planning application is supported by an appropriate report which supports these conclusions. It should be noted that the City Council is not in receipt of any comments from the Coal Authority and therefore reserves the right to comment on this matter further.

Flood risk and drainage

I consider flood risk and drainage cannot be scoped out of the ES for the reasons set out below.

Lighting

Due to the scale of the Proposed Development, the preliminary review of the likely effects relating to lighting has revealed that there will be a negligible impact on adjacent properties. I accept that a lighting assessment is capable of being scoped out of the ES provided an appropriate report, including mitigation should this be required, accompanies any future planning application.

Waste

The scoping report concludes there is nothing unusual or complex with regards to the production of waste or future waste management as a result of the construction activities and operational aspects of this development. As a result, there will be no significant effects which would require consideration by an EIA. I confirm that waste conditions can be scoped out of the ES provided the planning application is supported by an appropriate report which supports these conclusions.

Climate change

I consider climate change cannot be scoped out of the ES for the reasons set out below.

Human Health

I consider human health cannot be scoped out of the ES for the reasons set out below.

Accidents and disasters

I noted that the proposed development does not pose a risk of major accident and/or disaster. As such, I can confirm that accidents and disasters can be scoped out the ES.

Summary

I agree that some of the matters you have identified to be scoped out of the ES are appropriate. I am of the opinion, however, that Flood Risk and Drainage, Climate Change and Human Health (further details provided below) should be part of the ES.

The planning application must be supported by appropriate documentation, including any mitigation, to minimise any effects as a result of the Proposed Development from the matters capable of being scoped out. The City Council reserves the right to re-consider this position following a more detailed consideration of the reports which will accompany the planning application.

ENVIRONMENTAL STATEMENT CHAPTERS - SPECIFIC COMMENTS ON THE TECHNICAL CONTENTS

The ES should be proportionate in its consideration of the aspects of the environment listed under Paragraph 2 of Regulation 4 of the EIA Regulations. Those aspects of the environment that are subject to the most significant impacts from the Proposed Development should be the primary focus of the ES.

Your scoping report advises that the ES will cover the following topic areas.

- Townscape and visual;
- Transport and access;
- Air Quality and dust;
- Noise and Vibration; and
- Socio-economic

As highlighted above, you should also include Floor Risk and Drainage, Climate Change and Human Health within relevant chapters within the ES.

General Comments

For planning purposes, the development site is located in a Strategic Housing Location (policy H2) of the Manchester Core Strategy (2012) together with forming a key component of the North Gateway Strategic Development Framework (SRF).

The significance of the site should be reflected throughout the ES. The Environmental Chapters must therefore consider the impacts of the Proposed Development on this context in order to determine any wider significant environmental impacts.

Air Quality and dust

The comments within your scoping report are noted and are broadly acceptable in terms of their consideration in the ES.

The City Council, as Local Planning Authority, recommends that the ES must take account of the following additional matters with reference to impacts on air quality.

Potential construction effects should consider any impacts on air quality from the use of plant and equipment together with the impact from emissions from construction vehicles and construction workers vehicles in and around the development site.

The likely impacts of air quality on climate change require consideration within this chapter of the ES. This should include consideration of the extent that the Proposed Development will contribute to greenhouse gas emissions, either through vehicles accessing the development during construction and the operation of the development, through to the wider operations of the development and running of the new homes (boiler systems etc).

Socio-Economic Impacts

The comments within your scoping report are noted and are acceptable in terms of their consideration in the ES.

Noise and Vibration

The comments within your scoping report are noted and are acceptable in terms of their consideration in the ES.

Townscape and visual impact

The comments within your scoping report are noted and are acceptable in terms of their consideration in the ES. It is noted that the viewpoints have yet to be identified and agreed with the City Council, as Local Planning Authority, and therefore I reserve the right to comment on this further.

Traffic and Transport

The comments within your scoping report are noted and are broadly acceptable in terms of their consideration in the ES.

The City Council, as Local Planning Authority, recommends that the ES covers the following additional information in respect of traffic and transport within this chapter of the ES.

The assessment should provide a description of the current base traffic conditions in the area. In terms of highway safety, there will need to be an analysis of injury accidents during a recent five year period together with commentary on any underlying patters of injury accidents which may affect this development or exacerbated.

There will also need to be traffic and queue surveys (weekdays) and the scope agreed with the City Council, as Local Planning Authority. A clear estimate of the level of new traffic likely to be associated with the development, based on an inspection of similar (and similarly-located) developments across the UK (excluding London) via the TRICS (or similar) database should be undertaken.

The assessment work should be undertaken using a person-trip approach and applying the appropriate modal share percentages from local Census data. Other

methodologies to determine trip rates may acceptable but these should be fully explained within the Transport Assessment (TA).

There should also be a clearly defined methodology for determining the distribution / assignment of development trips onto the network i.e. understanding of where such new traffic is likely to distribute to/from, based on data sources such a Census Journey-to-Work statistics and/or vehicle turning proportions at nearby junctions.

There should also be an assessment of traffic levels and impacts at the specified year of opening of the development, and at a future year at least five years later, with due regard for traffic growth (if any) together with an understanding of the likely impacts of the proposed development considered alongside any other nearby committed developments.

The TA should include clear diagrams should be provided illustrating the following elements, each individually:

- Base Flows
- Committed Development Flows
- Proposed Flows
- Proposed Distribution
- Base plus Committed plus proposed development
- Future plus Committed plus proposed development

An increase of about 30vehs/hr at a junction is an appropriate threshold for considering the necessity of a traffic impact assessment; this is in preference to a percentage-increase threshold, which tends to favour development in already heavily -trafficked areas.

The scope of the junctions to be assessed by detailed modelling should be agreed with the City Council, as Local Planning Authority/Local Highway Authority, in advance and will depend upon the outcome of the trip assessment and distribution exercise. It is advised that a trip generation and distribution exercise should be issued before submission of the planning application. Once this is undertaken it will be possible to finalise requirements or the TA. This will largely depend on the amount of trip generation.

There should be clear details of proposed vehicular access arrangements including general servicing arrangements. An engineering drawing should be supplied showing the changes to the road network to fully understand the impact of the proposed development. A swept path analysis should be provided for any vehicular access.

It will also be necessary to do a review of Traffic Regulation Orders on the surrounding streets in the vicinity of the development sites.

There should also be an assessment of the likely environmental/traffic impacts of HGVs during the construction process.

The TA should also include a comprehensive review of the existing provision in the vicinity of the site for all pedestrians and cycling facilities including those with disabilities. In addition to walking distances and pedestrian desire lines, pedestrian environment (including footway condition and widths) and pedestrian safety and security should be considered.

An audit of the footways in the vicinity of the development should be undertaken and improvements identified.

A Travel Plan document incorporating actions that are aimed at encouraging sustainable travel during both the construction and operational phases of the Proposed Development is an essential component and the effects should be evaluated through the ES.

Air quality, climate change and human health impacts should be measured within this chapter of the ES as part of the incorporation of measures from the travel plan and any other mitigation measures to support public transport and other infrastructure. This would also demonstrate that the car parking and the capacity of the highway network is not exacerbated beyond existing baseline conditions both within the regional and city centres, during the construction and operational phrases of the Proposed Development.

Flood Risk and Drainage

It is considered that the flood risk and drainage impacts of the Proposed Development are significant and require assessment through the EIA process.

The City Council, as Local Planning Authority, recommends that the ES provides the following information in respect of flood risk and drainage within a chapter of the ES.

Due to the scale of the Proposed Development, a full flood risk (FRA) assessment should be carried out. The FRA should consider all sources of flooding, including surface water, establish the baseline flood risk using all available published sources and supplemented by site specific surveys where necessary. The impact of climate change should be considered together with further details on the culvert and an assessment of the risk of flooding in the instance of a partial or total collapse (including appropriate mitigation).

The Collyhurst Village site is at high risk of surface water flooding whilst the Collyhurst South site is at low risk. Both sites are at medium risk for ground water flooding.

It is essential that the ES considers how surface water from the Proposed Development will be captured, treated and disposed of both during the construction and operational phases.

There is potential run off and discharge during the construction process which has the potential to impact on the canal, which could impact upon water quality.

The ES and any strategy for surface water management during the operational phase, the Proposed Development needs to follow the drainage hierarchy:

- Infiltration into ground;
- Connection to the watercourse;
- Connection to discharge water sewer; and (as a last resort);
- Connection to the combined sewer.

Presence of made ground on the site is suspected. Site investigations and percolation tests in line with BRE 365 Digest should be undertaken as part of ES to assess feasibility of infiltration into the ground as a method of surface water disposal.

Due to the presence of the Moston Brook in culvert, if infiltration on the site is not possible, the ES should give consideration to the next discharging point for surface water which is the watercourse. Any works within or adjacent to the watercourse that would affect it would require consent from the Environment Agency.

Surface water discharging into the sewer should be the last restore and requires the consent of United Utilities.

As part of the consideration of the most appropriate method for dealing with surface water, and in the interest of climate change, the City Council, as Local Planning Authority, strongly recommends the use of sustainable drainage systems (SuDS) as part of controlling surface water and no exacerbating existing conditions.

The ES should consider SuDS as a method to control surface water as close to its source as possible. Well designated sustainable drainage systems provide clear opportunities to:

- Reduce the causes and impacts of flooding;
- Remove pollutants from urban run off at source;
- Combine water management with green space with benefits for amenity, recreation and wildlife.

The ES should consider controlling surface water through the use of SuDS in the interest of climate change and the overall sustainability of the Proposed Development and reducing any likely significant impacts on the Regional Centre, City Centre and beyond.

Green roofs, green walls, tree planting and other forms of green infrastructure to allow for the adaption to climate change in heavily urbainsed areas. This in turn will have ecological, biodiversity and air quality benefits which should be measured within the ES as part of the incorporation of such measures. This would also demonstrate that flood risk will not be increased elsewhere in both the regional and city centres, both during the construction and operational phrases of the Proposed Development.

Where SuDS cannot be used, the City Council will require a detailed justification within the ES.

Human Health

It is considered that the human health impacts of the Proposed Development are significant and require assessment through the EIA process.

Matters of air quality, transport and traffic, flood risk, noise and vibrations and socio-economic effects have all been scoped into the ES due to these disciplines having significant environmental impacts. All of these matters affect Human Health and therefore the Proposed Development is likely to give rise to significant environmental impacts on the Human Health which should be considered and evaluated through the ES.

This should include an assessment of the impact on human health with regards to any air quality considerations, climate change and quality of life, particularly during the construction process when heavy plant, machinery, dust and emissions are likely to be generated together with any noise, disturbance, traffic/transport and air quality considerations during the operational phases of the development.

Climate Change

It is considered that the climate change impacts of the Proposed Development are significant and require assessment through the EIA process.

The ES should consider the impact of the Proposed Development on climate change both through the construction and operational phases of the development and the significance of these impacts needs to be considered through a relevant chapter in the ES.

Matters of air quality, transport and traffic, flood risk and socio-economic effects have all been scoped into the ES due to these disciplines having significant environmental impacts. All of these matters affect climate change and therefore the Proposed Development is likely to give rise to significant environmental impacts on the climate which should be considered and evaluated through the ES.

A broader approach and methodology for assessing the impact on climate change should be considered. Impacts and potential mitigation from the other technical chapters should feed into this assessment particularly around management of surface water, waste management, social value, green and blue infrastructure, biodiversity and ecology, travel planning and efficiency of the building fabric of the new homes and use of renewable energy as part of promoting a low/zero carbon development and reducing emissions and the likely environmental impacts of this.

FURTHER INFORMATION

The City Council, as Local Planning Authority, has undertaken a thorough consideration of the information contained within your scoping report together with providing comments from relevant statutory consultees. The issuing of this Scoping Opinion does not preclude the City Council, as Local Planning Authority, from requesting further information at a later stage as the development proposals evolve or whilst a future planning application is being formally considered.

I trust this information is of some assistance to you. Should you require anything further please do not hesitate to contact myself or Jennifer Atkinson.

Yours sincerely

Dave Roscoe

Deputy Director of Planning

Greater Manchester Archaeological Advisory Service
Science, Engineering & Environment
Peel Building
Room LG20
University of Salford
M5 4WX

Jennifer Atkinson
Planning
Manchester City Council
PO Box 532
Town Hall
Manchester
M60 2LA

Your Ref: Collyhurst Village
Date: 30th March 2020

Dear Jennifer Atkinson,

Archaeological Consultation: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the "EIA" Regulations) - Request for Scoping Opinion

Site 1: Land bounded to the east of Rochdale Road, Collyhurst, Manchester
And
Site 2: Land to the south of Whitley Road, Collyhurst, Manchester

Thank you for your consultation on the above.

The consultation has been submitted with an EIA Scoping Report (dated March 2020) prepared by Avison Young. Chapter 12 addresses issues held to be insignificant for the purposes of the EIA. Heritage and Archaeology (12.4 – 12.6) . The report observes that having been developed previously both of the sites any buried archaeological remains will have been either removed, truncated or destroyed. Given a lack of designated heritage assets the proposed development areas are thought not to have any unknown archaeological assets beneath the ground. On this basis the subject has been scoped out of the EIA.

Having rapidly reviewed information on the Historic Environment Record GMAAS notes that both sites first underwent construction development in the late nineteenth century. This development was extensive and principally for varieties of terraced worker's housing and, in the case of site 2, a small Machine Works (subsequently Joinery Works). Presumably this is the 'development' activity referred to in the Scoping Report. Whilst the subjects of worker's housing and the engineering trades during the nineteenth century are both subjects of established archaeological interest GMAAS recognises that in this instance the remains that might be encountered would not be of sufficient significance to merit their physical preservation or to provide the basis for an objection to the development. On this basis **GMAAS agrees with the conclusions of the Scoping Report and recommend that archaeology is scoped out of the EIA**.

Yours sincerely

[redacted]

Andrew Myers BA, MSc, PhD, MCIFA, FSA
Senior Planning Archaeologist
[redacted]

Manchester City Council
PO Box 532
Manchester
Lancashire
M60 2LA

Our ref: SO/2020/120148/01-L01
Your ref: Collyhurst Village

Date: 20 March 2020

FAO: Jennifer Atkinson

Dear Ms Atkinson

TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 - ENVIRONMENTAL IMPACT ASSESSMENT (EIA) SCOPING OPINION REQUEST FORCOLLYHURST VILLAGE

MANCHESTER M40 8JN

Thank you for requesting an EIA Scoping Opinion from the Environment Agency on the above development proposal, which forms part of the wider Northern Gateway Strategic Regeneration Framework (SRF) area.

This referral was received in office on the 18th March 2020. However, prior to this consultation request, we have also be engaged in initial pre-application discussions for the Collyhurst Village area via Civic Engineers Ltd, assigned by the Far East Consortium.

In providing this this response we have reviewed the following documentation:

- Manchester City Council – EIA Scoping Request Cover Letter - [17th March 2020]
- EIA Scoping Report. Proposed Residential Development. Collyhurst, Manchester. Prepared by Avison Young. [March 2020]

Environment Agency Position / Commentary

Having reviewed the scoping report outlined above, we agree with the scoping decisions taken in regards to flood risk, ground conditions and waste, with regards to matter within the remit of the Environment Agency. However, we are concerned by the current the decision not to scope ecology, nature conservation and drainage into the forthcoming Environment Statement (ES), or at least provide further details regarding how these matters will be addressed separately as part of any subsequent planning submission(s).

As noted within the EIA scoping report, part of the aim of the North Gateway Strategic Regeneration Framework, is to deliver *"a series of vibrant, sustainable and integrated residential neighborhoods within the extend city centre of Manchester"* – we consider that in achieving this aim, a holistic assessment must be undertaken to ensure delivery of a final development which is sustainable and offers multi-functional benefits.

The scheme should, where viable, include the provision of blue-green infrastructure which offers multiple benefits including but not limited to: surface water drainage management, carbon / climate change reductions, as well as consideration of the requirements of the Water Framework Directive (WFD) (Irk (Wince to Irwell, WFD Ref: GB112069061131).

The position is further supported by aspirations of the forthcoming Environment Bill (https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018/environment-bill-summer-policy-statement-july-2019) - in which the government outlines a commitment to sustainable development and biodiversity net gain; as well as draft policy within Greater Manchester Spatial Framework (https://www.greatermanchester-ca.gov.uk/what-we-

do/housing/greater-manchester-spatial-framework/gmsf-full-plan/).

Finally, this position is also in accordance with paragraphs 170 and 175 of the National Planning Policy Framework (NPPF) which recognises that the planning system should conserve and enhance the environment by minimising impacts and providing net gains for biodiversity.

To assist in addressing the matters raised regarding the current scope of the EIA, we provide the following advice / informative:-

Proximity to Main River / WFD / Surface Water Drainage

With reference to the above, it has been identified under paragraph 2.12 of the scoping report that Moston Brook flows in culvert beneath the northern extent of the area defined as Collyhurst Village (Appendix A); the area noted also currently indicates a significant greenspace area.

Moston Brook is a designated 'Main River' and therefore, dependent on the development proposals brought forward, may require a permit under the Environmental Permitting (England and Wales) Regulations 2016 from the Environment Agency for any proposed works or structures, in, under, over or within eight metres from either side of a Main River (culvert noted).

Regulation 33 of the Water Environment (England and Wales) Regulations (2017) places a duty on each public body, including local authorities, to 'have regard to' River Basin Management Plans when exercising their functions. This means they must ensure they do not undertake or authorise a project which may jeopardise the current status of a WFD element, cause its deterioration or the potential attainment of good status.

For the purpose of this proposal, it should be firstly assessed whether the development brought forward presents a WFD risk. Further to this, we would seek that any future development ascertains the possibility of de-culverting the existing waterbody; and where deemed impractical based on technical feasibility or cost benefit, still looks to ensure future scheme design avoids further deterioration of the waterbody's ecological potential.

With reference to the large areas of existing greenspace, we would recommend as part of future scheme design, detailed ecological assessment be undertaken of the existing site to inform and shape future scheme design. It should also be identified through appropriate assessment how new surface water drainage design will protect the Moston Brook receptor and avoid new urban diffuse pollution. The proposal should look to adopt multifunctional sustainable urban drainage options where feasible. For information see:
(https://www.ciria.org//Memberships/The_SuDs_Manual_C753_Chapters.aspx)

Further to the above, the proposed development site is situated within a Critical Drainage Area as defined by the Lead Local Flood Authority (LLFA) and as such requires a 50% reduction of run off on brownfield sites compared to existing levels, we would advise that the view of the LLFA is sought on this matter if not already done so.

--

Should you have any queries regarding this response, or the matter raised within, then please do not hesitate to contact me.

Yours sincerely

Mr Andy Davies
Sustainable Places Advisor

[redacted]

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency
Cont/d..

MANCHESTER CITY COUNCIL

Jennifer Atkinson <j.atkinson@manchester.gov.uk>

RE: Collyhurst Village, Scoping Opinion, Ecology Response

1 message

[redacted] 7 April 2020 at 08:04

To: Jennifer Atkinson <j.atkinson@manchester.gov.uk>

Hi Jen

OK, I would accept that since there are no designated nature conservation sites involved, protected species interest is likely to be low, and taking into account EIA guidance, ecology could be scoped out. But ecology issues should still be considered in the applications, particularly in relation to net biodiversity gain.

From an ecology perspective I think it's important that this application fully takes into account the overall Northern Gateway vision

Best Regards

Derek

Derek Richardson

Principal Ecologist

Planning

Development and Investment

Growth

Tameside MBC | Twitter | Facebook | Instagram

Dukinfield Town Hall | King Street | Dukinfield | Tameside | SK16 4LA

[redacted]

[redacted]

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From: Jennifer Atkinson [mailto:j.atkinson@manchester.gov.uk]
Sent: 06 April 2020 14:48
To: Derek Richardson
Subject: Re: Collyhurst Village, Scoping Opinion, Ecology Response

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Many thanks Derek

Can I just clarify your comments. The applicant has suggested that ecology should be scoped out of the ES. Are you suggesting it should be scoped in? The ecology work would still be done but would just not fall within the scope of the EIA. I would be grateful if you could clarify.

Best wishes

Jen

Jennifer Atkinson

Principal Planner

Development Management North

Planning Building Control and Licensing - Growth and Development

Manchester City Council

Tel: 0161 234 4517

[redacted]

Email: j.atkinson@manchester.gov.uk

www.manchester.gov.uk

Location address: Manchester City Council Town Hall Extension Lloyd Street Manchester M2 5DB.

Postal Address: Manchester City Council P.O. Box 532 Town Hall Manchester M60 2LA

[Please note I am currently working from home until further notice. I can be contacted directly on my mobile]

On Mon, 6 Apr 2020 at 14:35, Derek Richardson [redacted] wrote:

> Dear Jennifer Atkinson
>
> Thank you for consulting the Ecology Unit on the above request for a Scoping Opinion
>
> I would recommend that any Environmental Assessment for the site(s) concerned should be informed by –
>
> - Surveys for habitats (extended Phase 1 habitat surveys or UK habitat classification surveys)
> - Bat activity surveys and assessment of trees for bat roost potential
> - A requirement to aim for a net gain in biodiversity to result from the development
> - A survey for invasive plant species and a method statement providing details about how invasive plants are to be controlled during the course of any approved development
>
> Yours sincerely
>
> Derek Richardson
>
> **Derek Richardson**
>
> **Principal Ecologist**
>
> Planning
>
> Development and Investment
>
> Growth
>
> Tameside MBC | Twitter | Facebook | Instagram
>
> Dukinfield Town Hall | King Street | Dukinfield | Tameside | SK16 4LA
>
> [redacted]
>
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Enviro nmenta l Health

Internal Memorandum

To Head of Planning FAO: Jennifer Atkinson

From Head of Compliance, Enforcement and Community Safety

~~Contact Officer: Karen Williamson Our Ref: 661262~~

Date: 6 April 2020 Telephone: 31374

Consultation on Planning Application

Description:
The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the "EIA" Regulations) - Request for Scoping Opinion
Site 1: Land bounded to the east of Rochdale Road, Collyhurst, Manchester
And
Site 2: Land to the south of Whitley Road, Collyhurst, Manchester

Location: Whitley Road, Manchester

I write in response to your scoping opinion regarding the above, and to inform you that I have considered this and recommend that the following conditions are attached to any approval.

Site 1
The proposed development would involve the redevelopment of above sites, for residential purposes up to 300 dwellings including a mix of townhouses and mid-rise (up to 6 storey) apartment buildings with associated car parking, boundary treatment and other associated works including park area.

A total of 28 existing dwellings and a shop on site 1 will demolished.

Site 2
The proposed development will include the erection of 30 dwellinghouses comprising of townhouses with associated car parking, boundary treatment and other associated works.

DEMOLITION/CONSTRUCTION PHASE*

1) A Construction Management Plan shall be submitted to and approved by the Council. This will contain a Noise & Vibration section (in addition to a dust emission section) that shall base the assessment on British Standard 5228, with reference to other relevant standards. It shall also contain a community consultation strategy which includes how and when local businesses and residents will be consulted on matters such out of hours works. Any proposal for out of hours works (as below) will be submitted to and approved by this section, the details of which shall be submitted at least 4 weeks in advance of such works commencing.

and

2) Construction/demolition works shall be confined to the following hours unless otherwise agreed in writing by the City Council as local planning authority:

- Monday - Friday: 7.30am - 6pm
- Saturday: 8.30am - 2pm
- Sunday / Bank holidays: No work

Reason - To safeguard the amenities of the occupiers of nearby residential and commercial properties during the construction/demolition phase.

*The applicant should refer to https://secure.manchester.gov.uk/info/100006/environmental_problems/2956/noise/9 and IAQM/EPUK Construction Guidance at: http://iaqm.co.uk/guidance/.

NSE4

Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise from all main roads and railway line shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises. The approved noise insulation scheme shall be completed before any of the dwelling units are occupied.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00)	30 dB L_{Aeq} (individual noise events shall not exceed 45 dB $L_{Amax,F}$ by more than 15 times)
Living Rooms (daytime - 07.00 - 23.00)	35 dB L_{Aeq}
Gardens and terraces (daytime)	55 dB L_{Aeq}

Upon completion of the development and before first occupation of the residential units, a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to

confirm that the internal noise criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.

Due to the proximity of the development to the train line, it will be necessary for vibration criteria to apply which can be found in BS 6472: 2008 *"Guide to evaluation of human exposure to vibration in buildings"*. Groundborne noise/re-radiated noise should also be factored into the assessment and design.

Reason: To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance.

We are in receipt of an Acoustic Report By Sandy Brown dated Jan 2020, ref:19514-R01-A. We await further results of:

• External noise levels around the proposed development
• Facade sound insulation requirements
• Recommendations on facade construction and ventilation strategy
• An assessment of tactile vibration and re-radiated noise from ground-borne noise.
• Noise/vibration data with freight trains

NSE6

Noise – external equipment insulation

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

The scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be completed before the premises is occupied.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site.

REF*

Before the development commences a scheme for the storage and disposal of refuse shall be submitted to and approved in writing by the City Council as local planning authority. The details of the approved scheme shall be implemented as part of the development and shall remain in situ whilst the use or development is in operation.

New developments shall have refuse storage space for segregated waste collection and recycling. Internal and external storage areas are required.

Reason - In the interests of amenity and public health.

*The proforma/ Waste Management Strategy must include the following information:

- Estimated volumes and types of waste produced by the development;
- Details of internal and external stores for both waste and recycling, including any plans and designs;
- Location of the proposed collection point and details of the route the collection vehicle will take;
- Details of how waste will be transferred between stores and to the collection location; and
- Details of number and capacity of bins proposed and collection frequency.
- Other details as per 'Waste Proforma v1.0' - refer to guidance at:

  http://www.manchester.gov.uk/downloads/download/6048/waste_management_strategy

10 units or below = low rise
11 or above = high rise

AIR QUALITY
Prior to commencement of the development mitigation measures to safeguard local air quality shall be submitted to and approved in writing by the City Council as local planning authority. Any agreed mitigation measures shall be implemented as part of the development and shall remain in situ whilst the use or development is in operation.

Reason: To secure a reduction in air pollution from traffic or other sources in order to protect existing and future residents from air pollution, pursuant to policies EN16, SP1 and DM1 of the Core Strategy.

CLAND01 (1) New applications, no previous contaminated land conditions

a) Before the development hereby approved commences, a report (the Preliminary Risk Assessment) to identify and evaluate all potential sources and impacts of any ground contamination, groundwater contamination and/or ground gas relevant to the site shall be submitted to and approved in writing by the City Council as local planning authority. The Preliminary Risk Assessment shall conform to City Council's current guidance document (Planning Guidance in Relation to Ground Contamination).

In the event of the Preliminary Risk Assessment identifying risks which in the written opinion of the Local Planning Authority require further investigation, the development shall not commence until a scheme for the investigation of the site and the identification of remediation measures (the Site Investigation Proposal) has been submitted to and approved in writing by the City Council as local planning authority.

The measures for investigating the site identified in the Site Investigation Proposal shall be carried out, before development commences and a report prepared outlining what measures, if any, are required to remediate the land (the Site Investigation Report and/or Remediation Strategy) which shall be submitted to and approved in writing by the City Council as local planning authority.

b) When the development within each phase commences, 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.

In the event that ground contamination, groundwater contamination and/or ground gas, not previously identified, are found to be present on the site at any time before the development in each phase is occupied, then development shall cease and/or the development shall not be occupied until, a report outlining what measures, if any, are required to remediate the land (the Revised Remediation Strategy) is submitted to and approved in writing by the City Council as local planning authority and the development shall be carried out in accordance with the Revised Remediation Strategy, which shall take precedence over any Remediation Strategy or earlier Revised Remediation Strategy.

Reason - To ensure that the presence of or the potential for any contaminated land and/or groundwater is detected and appropriate remedial action is taken in the interests of public safety, pursuant to [INSERT] of the Unitary Development Plan for the City of Manchester.

Commercial use – please note all the above conditions (except NSE4) are also still applicable for the commercial and community outlets

DEL

Deliveries to commercial premises

Deliveries, servicing and collections, including waste collections shall not take place outside the following hours: 07:30 to 20:00, Monday to Saturday, no deliveries/waste collections on Sundays/Bank Holidays.

Reason - To safeguard the amenities of the occupiers of nearby residential accommodation.

FUME*

Fume/Odours discharge

Fumes, vapours and odours shall be extracted and discharged from the premises in accordance with a scheme to be submitted to and approved in writing by the City Council as local planning authority before the use commences; any works approved shall be implemented before the use commences.

Mixed use schemes shall ensure provision for internal ducting in risers that terminate at roof level. Schemes that are outside the scope of such developments shall ensure that flues terminate at least 1m above the eave level and/or any openable windows/ventilation intakes of nearby properties.

Reason - In the interests of the amenities of occupiers of nearby properties.

*The applicant will need to consult with a suitably qualified ventilation engineer and submit a kitchen fume extract strategy report for approval. The strategy should include risk assessments for odour and noise and be based on appropriate guidance such as that published by EMAQ titled ‘Control of Odour and Noise from Commercial Kitchen Exhaust Systems’ dated September 2018. Details should also be provided in relation to replacement air.

HOURS2

Premises opening hours

The premises shall not be open outside the following hours unless otherwise agreed in writing by the City Council as local planning authority:-

State days and times

Reason - To safeguard the amenities of the occupiers of nearby residential accommodation.

LIGHT (if applicable)

External Lighting Scheme

External lighting shall be designed and installed so as to control glare and overspill onto nearby residential properties.

Reason - To safeguard the amenities of the occupiers of nearby properties.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved light consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the criteria.

NSE1

The premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 10dB below the L_{A90} (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63HZ and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.

Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties.

Before the Class use hereby approved commences, the premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as Local Planning Authority. The scheme proposed shall normally include measures such as acoustic lobbies at access and egress points of the premises, acoustic treatment of the building structure, sound limiters linked to sound

amplification equipment and specified maximum internal noise levels. Any scheme approved in discharge of this condition shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as Local Planning Authority.

NSE2 (if applicable)

Class use A3 (external areas)

Shall only allow use of external areas within the application site in accordance with a schedule of days and hours of operation submitted to and approved in writing by the City Council as local planning authority, and shall not allow for the use of amplified sound or any music in these external areas at any time.

Reason - To safeguard the amenities of the occupiers of nearby properties.

Information for Developers guidance documents can be downloaded using the following link:
http://www.manchester.gov.uk/info/500207/planning_and_regeneration/1962/additional_planning_guidance/3

Should you wish to discuss this matter further please contact Karen Williamson on extension [redacted].

Fiona Sharkey
Head of Compliance, Enforcement and Community Safety

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the "EIA" Regulations) - Request for Scoping Opinion: Collyhurst Village

(Flood Risk Management response – 7 April 2020)

The proposed developments are situated within Flood Zone1 . The Flood Map for Rivers and Sea can be viewed at: http://maps.environment-agency.gov.uk/.

The Collyhurst village site has areas at high risk of surface water flooding. The Collyhurst south site is largely at low risk of surface water flooding. The Flood Map for Surface Water can be viewed at: http://maps.environment-agency.gov.uk/.

The proposed development is within an area at medium susceptibility to groundwater flooding.

MCC does not hold any recorded incidents of flooding within the site or close vicinity.

. Surface water management for the site needs to follow the drainage hierarchy:

- Infiltration into ground
- Connection to the watercourse
- Connection to discharge water sewer and as a last resort;
- Connection to the combined sewer.

Presence of Made Ground on site could be suspected. However, site investigation and percolation tests in line with BRE 365 Digest should be undertaken to assess feasibility of infiltration into ground as a method for surface water disposal.

Moston Brook in culvert runs through the Collyhurst Village site and if infiltration on site is not possible, the next discharging point for surface water should be this watercourse, where feasible and should be discussed with the Environment Agency as Moston Brook is Main River.

If surface water is to be discharged into a United Utilities sewer this should be agreed in principle with them.

The Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications which was introduced on 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS). As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems.

SuDS should be designed to control surface water as close to its source as possible. Well-designed sustainable drainage systems also provide opportunities to:

- reduce the causes and impacts of flooding,
- remove pollutants from urban run-off at source,
- combine water management with green space with benefits for amenity, recreation and wildlife.

The Council is encouraging use of green roofs, green walls, tree planting and other forms of green infrastructure to allow for the adaptation to climate change in heavily urbanised area. New Green infrastructure provision should be an exemplar of best practice and innovation in terms of both its design and management. Greater Manchester is the first city-region in

the UK to develop a Natural Capital Investment Plan designed to encourage investments in natural capital that deliver financial as well as social returns.

The use of SuDS should also help achieve the sustainability objectives of the National Planning Policy Framework (NPPF).

The suitability of sustainable drainage systems should be assessed in accordance with paragraphs 051, 079 and 080 of the revised NPPF Planning Practice Guidance for Flood Risk and Coastal Change (http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/).

Sustainable drainage systems should be designed in line with national Non-Statutory Technical Standards for SuDS (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf) and local policies EN08, EN09, EN14, EN15 and EN17 of the Core Strategy.

The area is situated within a Critical Drainage Area and in accordance with the Manchester City Council SFRA at least a 50% reduction in surface water runoff should be provided through SUDS as part of any brownfield development with the aim of reducing to the Greenfield runoff rates.

Surface water should be managed to ensure there is no increased surface water from the proposed development and runoff from extreme events should be retained within the site such that the adjacent third party land is not affected.

Hydraulic calculations and drawings to support the design need to be provided along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPPF Planning Practice Guidance.

Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime shall be submitted.

Collyhurst Residential- April 2020

Development Proposals:

The proposed residential development will be across two neighbouring sites:

Site 1- Collyhurst Village: Erection of up to 300 dwellings including a mix of townhouses and mid-rise apartment buildings with associated car parking, boundary treatment and other associated works including park area. A total of 28 existing dwellings and a shop on site 1 will demolished.

Site 2- South Collyhurst: Erection of 30 dwelling houses comprising of townhouses with associated car parking, boundary treatment and other associated works.

Car Parking:

In-curtilage car parking should be made available in line with the Northern Gateway SRF.
Commentary will be required to discuss the impact of on-street parking in the locality. The applicant may be required to contribute to the implementation of a Resident Parking Zone in the area which is currently being considered by MCC Highways, as previously discussed within initial correspondence.

The developer should also consider the following in terms of parking requirements:

- Electric vehicle charging facilities are required, providing a minimum of 7kw per charge point.
- Disabled allocation within car parks should be clearly identified
- Spaces within the car park should be minimum 2.4m x 4.8m separated by a 6m aisle width. Individual driveway spaces should offer a minimum of 3.0m x 6.0m.

Cycle Parking:

100% cycle parking should be provided for each of the residential units. All cycle storage must offer secure and sheltered accommodation.
Additional cycle storage is also recommended within the site's public realm to encourage cycling as a viable mode choice.The applicant should consider cycle improvements within the vicinity of the site to improve connectivity for cyclists.

Highway details and Site Layout:

Should adoption of new highway be sought, all aspects of highway infrastructure should be designed and constructed to adoptable standards (including highway layout, dimensions, gradient, drainage, lighting etc). Adoption of the highway will be undertaken a Section 38 Agreement with MCC Highways.

All new carriageway must maintain a minimum of 5.5m supported by 2m footways to either side. Driveways should be placed at a minimum distance of 10m from junctions to maintain appropriate sight lines for vehicles and pedestrians. Turning heads to facilitate the movement of 11.5m standard refuse vehicles will be required, their suitability demonstrated via appropriate swept path analysis. Junction protection and further TROs should be implemented where appropriate.

Mitigation Works and Junction Upgrades:

As previously highlighted to Civic Engineers within initial pre-plan discussions, there may be a requirement for the applicant to upgrade junctions at Rochdale Road given the increase in pedestrian and vehicle flows. This is likely to include a signalised facility to accommodate both cyclists and pedestrians. Further detailed discussion will be required with MCC/ TfGM to agree a detailed design of the junctions.

Please note that given the current exceptional circumstances, no junction modelling should be undertaken until traffic flows return to a typical level, as these will not provide an accurate representation of the network.

General Considerations:

Should the planning application be approved, for any works to the adopted highway, stopping up etc. the applicant will be required to enter into a suitable highways agreement (S278 etc). The applicant will need to follow the appropriate link on the MCC website.

The applicant is advised that access arrangements and any requirements for licensing, hoarding / scaffolding and any associated temporary traffic management arrangements will require discussion and agreement with MCC Highways Applications and Network Resilience teams via Contact Manchester (Tel. 0161 234 5004). It is recommended that the applicant begins liaison with Network Resilience at the earliest possible opportunity.

For the avoidance of doubt, all non-standard materials to be used on the adopted highway will be subject to applicable commuted sums, likewise for the implementation of street trees on the highway.

It should also be noted that if there are any excavations and former cellars adjacent to the highway then structural drawings and calculations for temporary and permanent support works must be submitted for checking (for a fee) to MCC Bridges/Structures Section.

Early discussion should be held with MCCs Flood Risk Team to discuss sustainable drainage options for the site.

A construction management plan is required prior to any demolition or construction works commencing on the site which may impact on highway operations. This plan should provide details of the proposed construction traffic routes to and from the site, the site compound details, the controls to ensure deliveries and loading do not block the highway, traffic estimates and the measures for on-site / off-site car parking. A planning condition setting out the requirement for a construction management plan is therefore recommended.

Dilapidation surveys should also be requested and the applicant should include photographs and commentary on the condition of carriageway / footways on construction vehicle routes surrounding the site.

This is to protect MCC and the contractors to verify (prior to construction) the condition of the carriageway.

- TRAVEL PLAN

The submission of a Travel Plan will be required within the submission, the implementation of which will be attached to any future approval at the site.

TRANSPORT ASSESSMENT BRIEF:

- A description of current baseline traffic conditions in the area.
- An analysis of injury accidents during a recent five-year period, commenting on whether there are any underlying patterns of injury accidents that might be affected by the development.
- Traffic surveys and queue surveys (weekdays) - scope to be agreed with TfGM UTC and HFAS.
- A clear estimate of the level of new traffic likely to be associated with the development, based on an inspection of similar (and similarly-located) developments across the UK (excluding London) via the TRICS (or similar) database. The assessment work should be undertaken using a person-trip approach and applying the appropriate modal share percentages from local Census data. Other methodologies to determine trip rates are acceptable but these should be fully explained in the TA.
- A clearly defined methodology for determining the distribution / assignment of development trips onto the network i.e. understanding of where such new traffic is likely to distribute to/from, based on data sources such a Census Journey-to-Work statistics and/or vehicle turning proportions at nearby junctions.
- An assessment of traffic levels and impacts at the specified year of opening of the development, and at a future year at least five years later, with due regard for traffic growth (if any).
- An understanding of the likely impacts of the proposed development considered alongside any other nearby committed developments.
- In the relevant TA, clear diagrams should be provided illustrating the following elements, each individually:
- Base Flows
- Committed Development Flows
- Proposed Flows
- Proposed Distribution
- Base plus Committed plus proposed development
- Future plus Committed plus proposed development

- TfGM HFAS recommends an increase of about 30vehs/hr at a junction as an appropriate threshold for considering the necessity of a traffic impact assessment; this is in preference to a percentage-increase threshold, which tends to favour development in already heavily-trafficked areas.
- The scope of the junctions to be assessed by detailed modelling should be agreed with TfGM (UTC) in advance and will depend upon the outcome of the trip assessment and distribution exercise. For this reason, TfGM would advise that a trip generation and distribution exercise should be issued before submission of the planning application. Once this is undertaken it

will be possible to finalise TfGM requirements in terms of the TA. This will largely depend on the amount of trip generation.

- Clear details of proposed vehicular access arrangements including general servicing arrangements. An engineering drawing should be supplied showing the changes to the road network to fully understand the impact of the proposed development.
- A swept path analysis should be provided for any vehicular access.
- A review of Traffic Regulation Orders on the surrounding streets in the vicinity of the development.
- An assessment of the likely environmental/traffic impacts of HGVs during the construction process.

PEDESTRIANS

The TA should include a comprehensive review of the existing provision in the vicinity of the site for all pedestrians including those with disabilities. In addition to walking distances and pedestrian desire lines, pedestrian environment (including footway condition and widths) and pedestrian safety and security should be considered.

An audit of the footways in the vicinity of the development should be undertaken and improvements identified.

MANCHESTER CITY COUNCIL

Jennifer Atkinson <j.atkinson@manchester.gov.uk>

Consultation on Scoping Opinion - Collyhurst Village

1 message

Lynda Griffin [redacted] 9 April 2020 at 10:29
To: "j.atkinson@manchester.gov.uk" <j.atkinson@manchester.gov.uk>
Cc: Alan Lowe [redacted], Andrew Charnock [redacted], Darren Embury [redacted], gregg mitchel [redacted], Jennifer McKinney [redacted], Landuse [redacted]

Jennifer,

RE: Scoping Opinion – Collyhurst Village

Site 1: Land bounded to the east of Rochdale Road, Collyhurst, Manchester

Site 2: Land to the south of Whitley Road, Collyhurst, Manchester

The location of the proposed developments are sufficiently remote from Metrolink that we have no comments to make from a construction aspect. However, we would ask that as part of the Transport Statement that modal split, particularly with regards anticipated tram patronage, is addressed such that Metrolink can gauge the likely increase in demand as a result of the proposed developments.

Regards

Lynda

Lynda Griffin

Approvals and Consents Manager
Metrolink
Transport for Greater Manchester

2 Piccadilly Place, Manchester M1 3BG

Mobile [redacted]
Office fax [redacted]
www.tfgm.com

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Date: 20 March 2020
Our ref: 312404

Jennifer Atkinson,
Manchester City Council,
j.atkinson@manchester.gov.uk

BY EMAIL ONLY

Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
C W1 6GJ

T 0300 060 3900

Dear Ms Atkinson,

Environmental Impact Assessment Scoping consultation (Regulation 15 (4) of the Town & Country Planning EIA Regulations 2017): Residential Redevelopment of Collyhurst Village.
Location: Site 1: Land bounded to the east of Rochdale Road, Collyhurst, Manchester and Site 2: Land to the south of Whitley Road, Collyhurst, Manchester.

Thank you for your consultation dated and received by Natural England on 17 March 2020.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

The scoping request is for a proposal that does not appear, from the information provided, to affect any nationally designated geological or ecological sites (Ramsar, SPA, SAC, SSSI, NNR) or landscapes (National Parks, AONBs, Heritage Coasts, National Trails), or have significant impacts on the protection of soils (particularly of sites over 20ha of best or most versatile land), nor is the development for a mineral or waste site of over 5ha.

At present therefore it is not a priority for Natural England to advise on the detail of this EIA. We would, however, like to draw your attention to some key points of advice, presented in annex to this letter, and we would expect the final Environmental Statement (ES) to include all necessary information as outlined in Part 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017. If you believe that the development does affect one of the features listed in paragraph 3 above, please contact Natural England at consultations@naturalengland.org.uk, and we may be able to provide further information.

Yours sincerely,

Alice Watson
Consultations Team

Annex A – Advice related to EIA Scoping Requirements

1. General Principles

Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended), sets out the necessary information to assess impacts on the natural environment to be included in an ES, specifically:

1. A description of the development, including in particular:
(a) a description of the location of the development;
(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.

2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the development on the environment resulting from, inter alia:
(a) the construction and existence of the development, including, where relevant, demolition works;
(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
(g) the technologies and the substances used. The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC (a) and Directive 2009/147/EC(b).

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

2. **Biodiversity and Geology**

2.1. Ecological Aspects of an Environmental Statement

Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EcIA) have been developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and are available on their website.

EcIA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EcIA may be carried out as part of the EIA process or to support other forms of environmental assessment or appraisal.

The National Planning Policy Framework (NPPF) sets out guidance in paragraphs 170-171 and 174-177 on how to take account of biodiversity interests in planning decisions and the framework that local authorities should provide to assist developers.

2.2. Internationally and Nationally Designated Sites

Natural England undertakes an initial assessment of all development consultations, by determining whether the location to which they relate falls within geographical 'buffer' areas within which development is likely to affect designated sites. The proposal is located outside these buffer areas and therefore appears unlikely to affect an Internationally or Nationally designated site. However, it should be recognised that the specific nature of a proposal may have the potential to lead to significant impacts arising at a greater distance than is encompassed by Natural England's buffers for designated sites. The ES should therefore thoroughly assess the potential for the proposal to affect designated sites, including Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites and Sites of Special Scientific Interest (SSSI). Should the proposal result in an emission to air or discharge to the ground or surface water catchment of a designated site then the potential effects and impact of this would need to be considered in the Environmental Statement

Local Planning Authorities, as competent authorities under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended), should have regard to the Habitats Regulations Assessment process set out in Regulation 63 of the Habitats Regulations in their determination of a planning application. Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.

Statutory site locations can be found at www.magic.gov.uk. Further information concerning particular statutory sites can be found on the Natural England website.

2.3. Protected Species

The ES should assess the impact of all phases of the proposal on protected species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.

The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 *Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System*. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.

Natural England has adopted standing advice for protected species. It provides a consistent level of basic advice which can be applied to any planning application that could affect protected species. It also includes links to guidance on survey and mitigation.

Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species.

2.4. Regionally and Locally Important Sites

The ES should thoroughly assess the impact of the proposals on non-statutory sites, for example Local Wildlife Sites (LoWS), Local Nature Reserves (LNR) and Regionally Important Geological and Geomorphological Sites (RIGS). Natural England does not hold comprehensive information on these sites. We therefore advise that the appropriate local biological record centres, nature conservation organisations, Local Planning Authority and local RIGS group should be contacted with respect to this matter.

2.5. Biodiversity Action Plan Habitats and Species

The ES should thoroughly assess the impact of the proposals on habitats and/or species listed in the UK Biodiversity Action Plan (BAP). These Priority Habitats and Species are listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, recently published under the requirements of S14 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available in the Defra publication 'Guidance for Local Authorities on Implementing the Biodiversity Duty'.

Government Circular 06/2005 states that BAP species and habitats, 'are capable of being a material consideration…in the making of planning decisions'. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.

The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of BAP habitat for the area under consideration.

3. Landscape, Access and Recreation

3.1. Landscape and Visual Impacts

The consideration of landscape impacts should reflect the approach set out in the *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and the Institute of Environmental Assessment and Management, 2013, 3rd edition), the *Landscape Character Assessment Guidance for England and Scotland* (Scottish Natural Heritage and The Countryside Agency, 2002) and good practice. The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England would expect

the cumulative impact assessment to include those proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

The assessment should refer to the relevant National Character Areas which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.

3.2. Access and Recreation

The ES should include a thorough assessment of the development's effects upon public rights of way and access to the countryside and its enjoyment through recreation. With this in mind and in addition to consideration of public rights of way, the landscape and visual effects on Open Access land, whether direct or indirect, should be included in the ES.

Natural England would also expect to see consideration of opportunities for improved or new public access provision on the site, to include linking existing public rights of way and/or providing new circular routes and interpretation. We also recommend reference to relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.

4. Land use and soils

Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 170 and 171 of the NPPF. We also recommend that soils should be considered under a more general heading of sustainable use of land and the valuing of the ecosystem services they provide as a natural resource, also in line with paragraph 170 of the NPPF.

Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society; for instance as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably. The Natural Environment White Paper (NEWP) *'The Natural Choice: securing the value of nature'* (Defra, June 2011), emphasises the importance of natural resource protection, including the conservation and sustainable management of soils and the protection of BMV agricultural land.

Development of buildings and infrastructure prevents alternative uses for those soils that are permanently covered, and also often results in degradation of soils around the development as result of construction activities. This affects their functionality as wildlife habitat, and reduces their ability to support landscape works and green infrastructure. Sealing and compaction can also contribute to increased surface run-off, ponding of water and localised erosion, flooding and pollution.
Defra published a Construction Code of Practice for the sustainable use of soils on construction sites (2009). The purpose of the Code of Practice is to provide a practical guide to assist anyone involved in the construction industry to protect the soil resources with which they work.

As identified in the NPPF new sites or extensions to new sites for Peat extraction should not be granted permission by Local Planning Authorities or proposed in development plans.

General advice on the agricultural aspects of site working and reclamation can be found in the Defra Guidance for successful reclamation of mineral and waste sites.

5. Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which

may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.

6. Climate Change Adaptation

The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment "by establishing coherent ecological networks that are more resilient to current and future pressures" (NPPF Paras 170 and 174), which should be demonstrated through the ES.

MANCHESTER CITY COUNCIL

Jennifer Atkinson <j.atkinson@manchester.gov.uk>

Fwd: Scoping opinion - Collyhurst Village

1 message

Planning MCC <planning@manchester.gov.uk> 1 April 2020 at 08:44
To: Sue Wills [redacted], Jennifer Atkinson [redacted]
Cc: Des Jones [redacted]

See the email.

Technical Support Team (Planning)
Planning, Building Control & Licensing
Growth & Development Directorate
Postal address: Manchester City Council, P O Box 532, Town Hall, Manchester M60 2LA
Location address: Level 6 Town Hall Extension, Manchester M2 5DB
Tel: 0161 234 4516

Please consider the environment before printing an e-mail.

---------- Forwarded message ---------
From: **Rimmer, Gemma** [redacted]
Date: Wed, 1 Apr 2020 at 07:52
Subject: Scoping opinion - Collyhurst Village
To: planning@manchester.gov.uk <planning@manchester.gov.uk>

Dear Sir/Madam

In response to Screening Request Ref**: Collyhurst Village**, United Utilities does not comment on Screening or Scoping Requests as the level of information we require in terms of understanding any water or wastewater requirements is likely to only become available once the development proposal is progressed nearer to planning application stage. Once the appropriate information is available, we would review and recommend any necessary planning conditions at the planning application consultation stage.

We do however, wish to continue to work closely with local authorities and developers alike in a bid to support sustainable development and economic growth. We would encourage potential developers to contact us at the appropriate time for pre-application discussions. Information for our pre-application services for both water and wastewater is available on our website.

Kind Regards

Gemma Rimmer
Planning Analyst

Developer Services and Metering

Water for the North West

T: [redacted]

unitedutilities.com

EMGateway3.uuplc.co.uk made the following annotations

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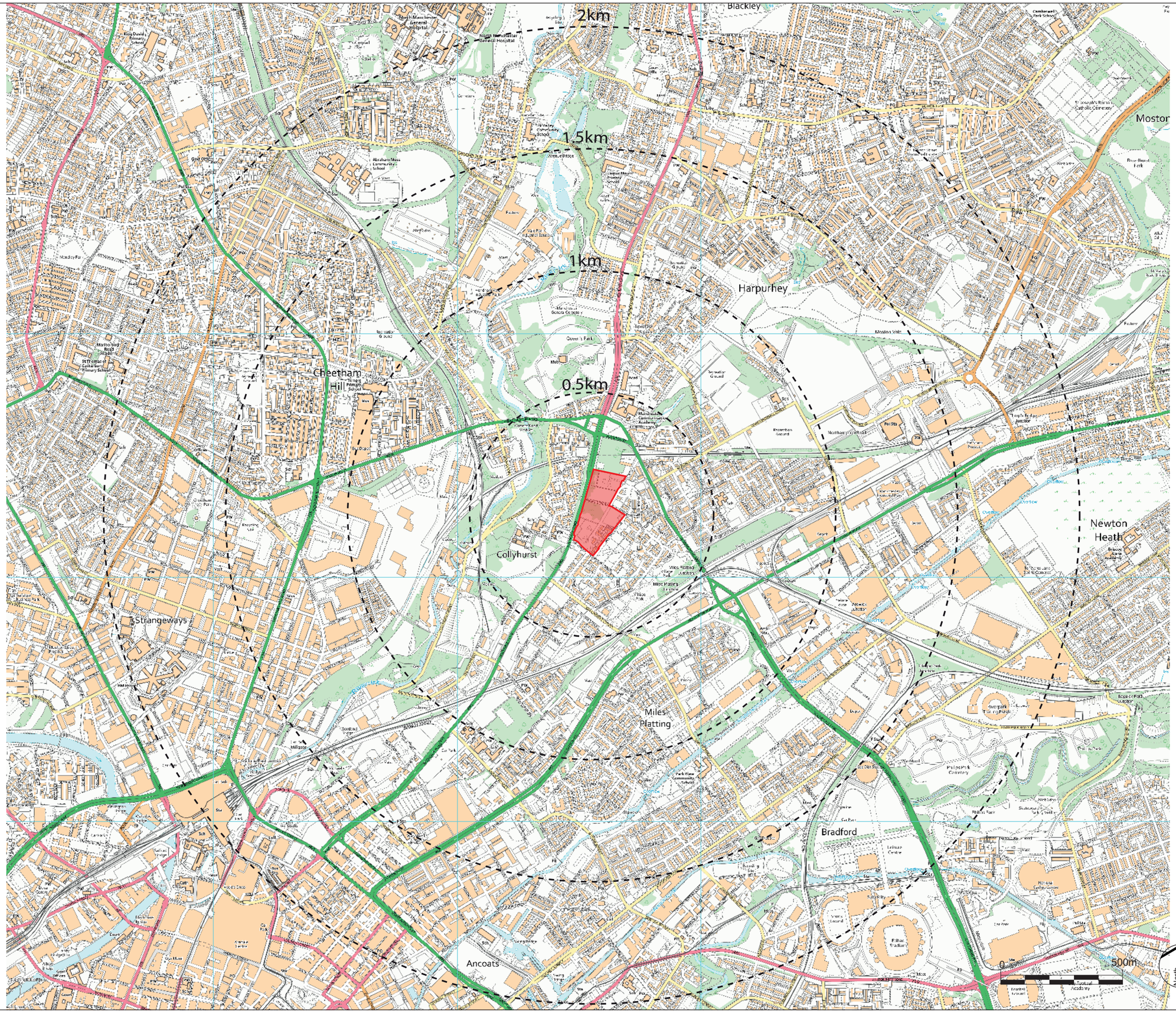

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Application Site Boundary

Rev	Description	Date
A	PLANNING ISSUE	05.11.2020
-	INITIAL ISSUE	16.10.2020

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E-MAIL office@exteriorarchitecture.com
WEB www.exteriorarchitecture.com

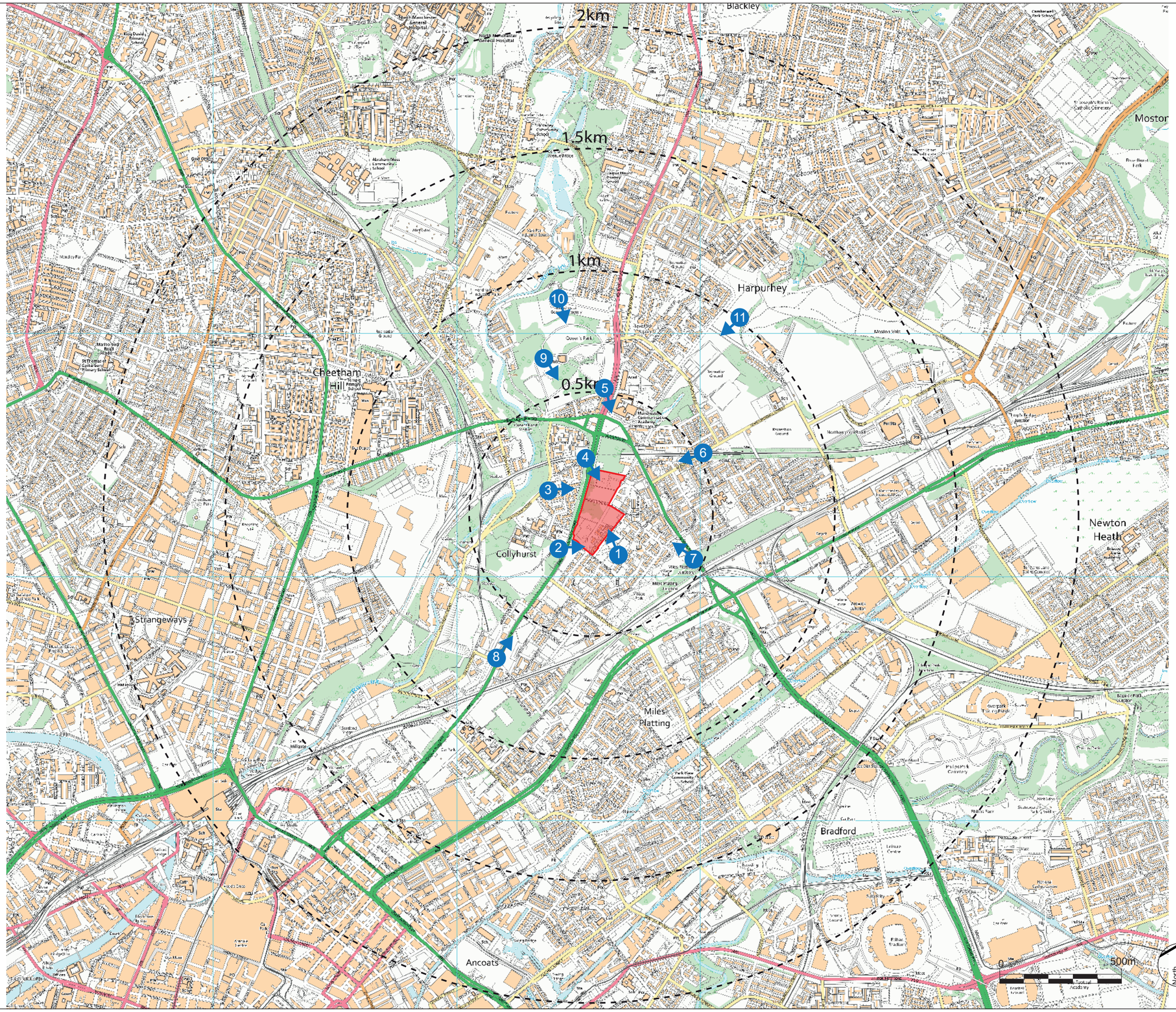
Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.1 FIGURE 1:
LOCATION PLAN

Issued By	Manchester	T: 0161 850 8101	
Scale	AS SHOWN	Drawn	ExA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1050

Revision
A



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Application Site Boundary

Viewpoint locations

1 - Collyhurst Park
2 - Eggington Street - Sand Hills Park
3 - Dalbury Drive
4 - Rochdale Road at Glendower Drive
5 - Rochdale Road at Park View
6 - Monsall Street, Monsall Metrolink Station
7 - Queens Road
8 - Rochdale Road at Roach Court
9 - Queens Park
10 - Manchester General Cemetery
11 - Moston Vale

Rev	Description	Date
B	PLANNING ISSUE	05.11.2020
A	DRAFT ISSUE	16.10.2020
-	INITIAL ISSUE	28.09.2020

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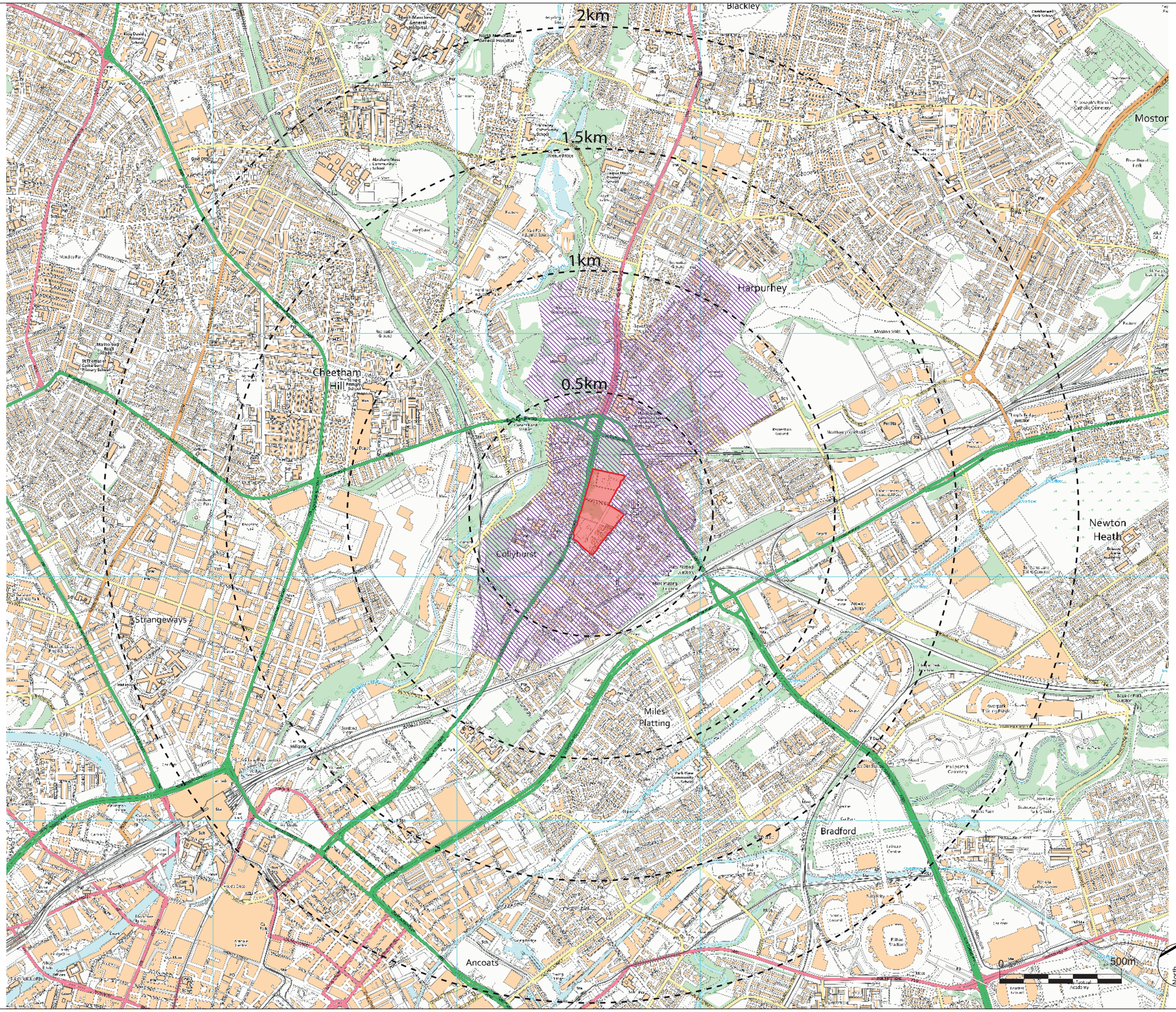
Project title
COLLYHURST VILLAGE

Drawing title
APPENDIX 7.1 FIGURE 2:
VIEWPOINT LOCATIONS

Issued By	Manchester	T: 0161 850 8101	
Scale	AS SHOWN	Drawn	ExA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1051

Revision
B



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All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Application Site Boundary

Zone of Theoretical Visibility

Rev	Description	Date
A	PLANNING ISSUE	05.11.2020
-	INITIAL ISSUE	28.09.2020

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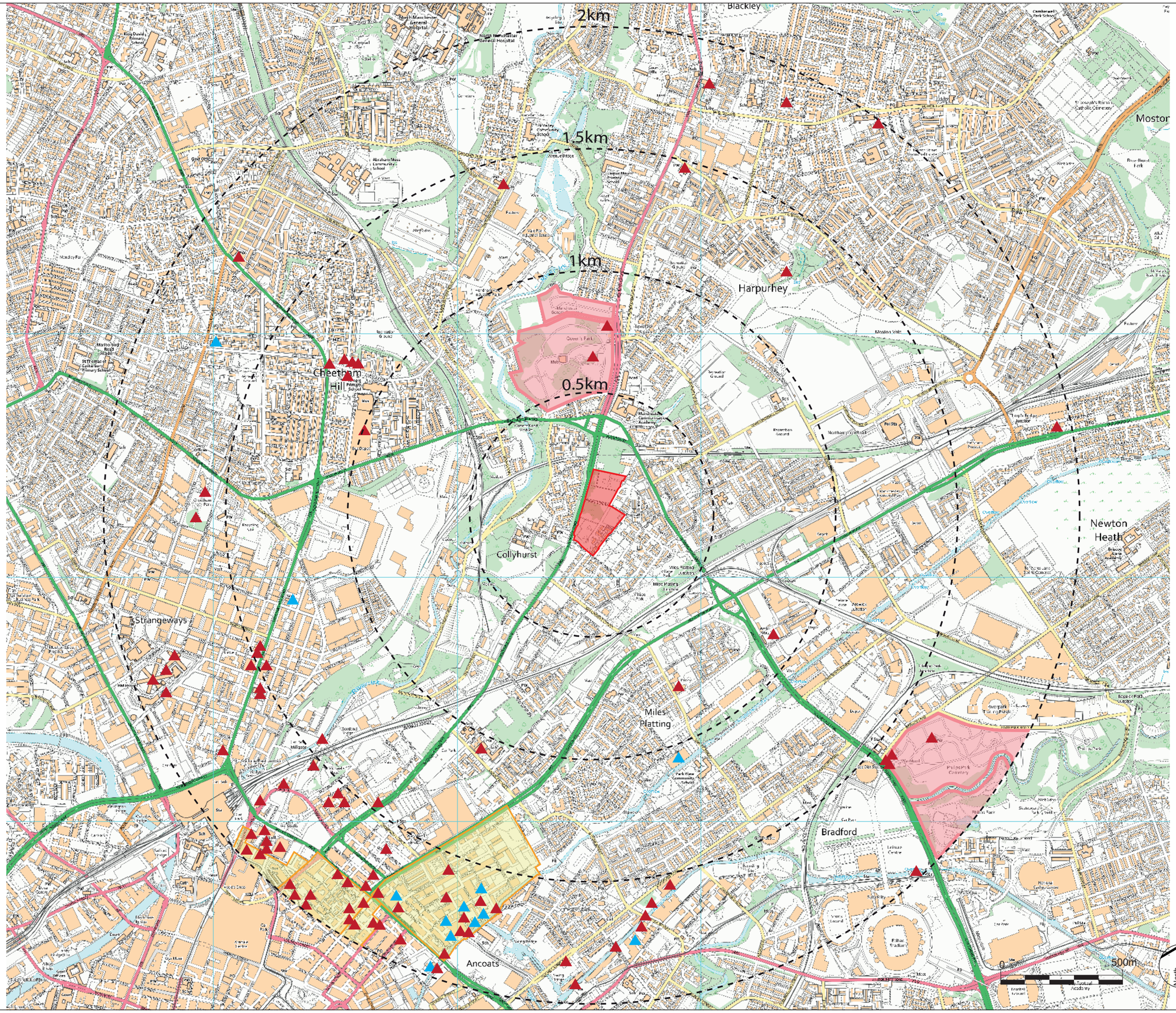
Project title
COLLYHURST VILLAGE

Drawing title
APPENDIX 7.1 FIGURE 3:
ZONE OF THEORECTICAL
VISIBLILITY

Issued By	Manchester	T: 0161 850 8101	
Scale	AS SHOWN	Drawn	ExA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1052

Revision
A



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Area measurements for indicative purposes only.

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- Application Site Boundary
- Conservation Areas
- Listed buildings
  - Grade II*
  - Grade II
- Registered Parks and Gardens

Rev	Description	Date
A	PLANNING ISSUE	05.11.2020
-	INITIAL ISSUE	16.10.2020

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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.1 FIGURE 4: ENVIRONMENTAL & HISTORIC DESIGNATIONS

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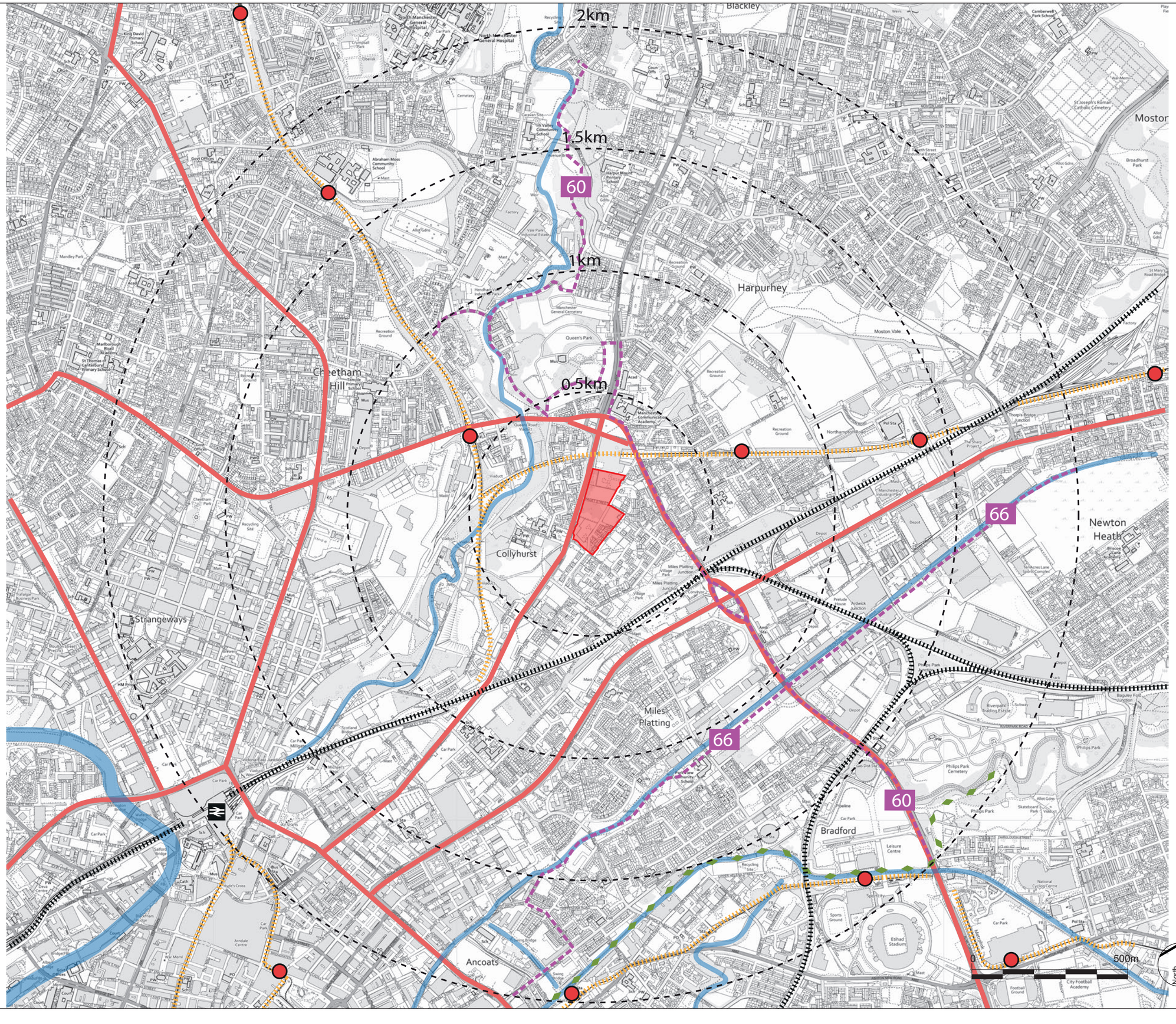
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1053

Revision
A



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Area measurements for indicative purposes only.

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- Application Site Boundary
- Railway (with station)
- Metro line (with station)
- Major (A) road
- National cycle route
- Long distance footpath
- Waterway

Rev	Description	Date
A	PLANNING ISSUE	05.11.2020
-	INITIAL ISSUE	16.10.2020

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Project title
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Drawing title
ES APPENDIX 7.1 FIGURE 5: MOVEMENT

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Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1054

Revision
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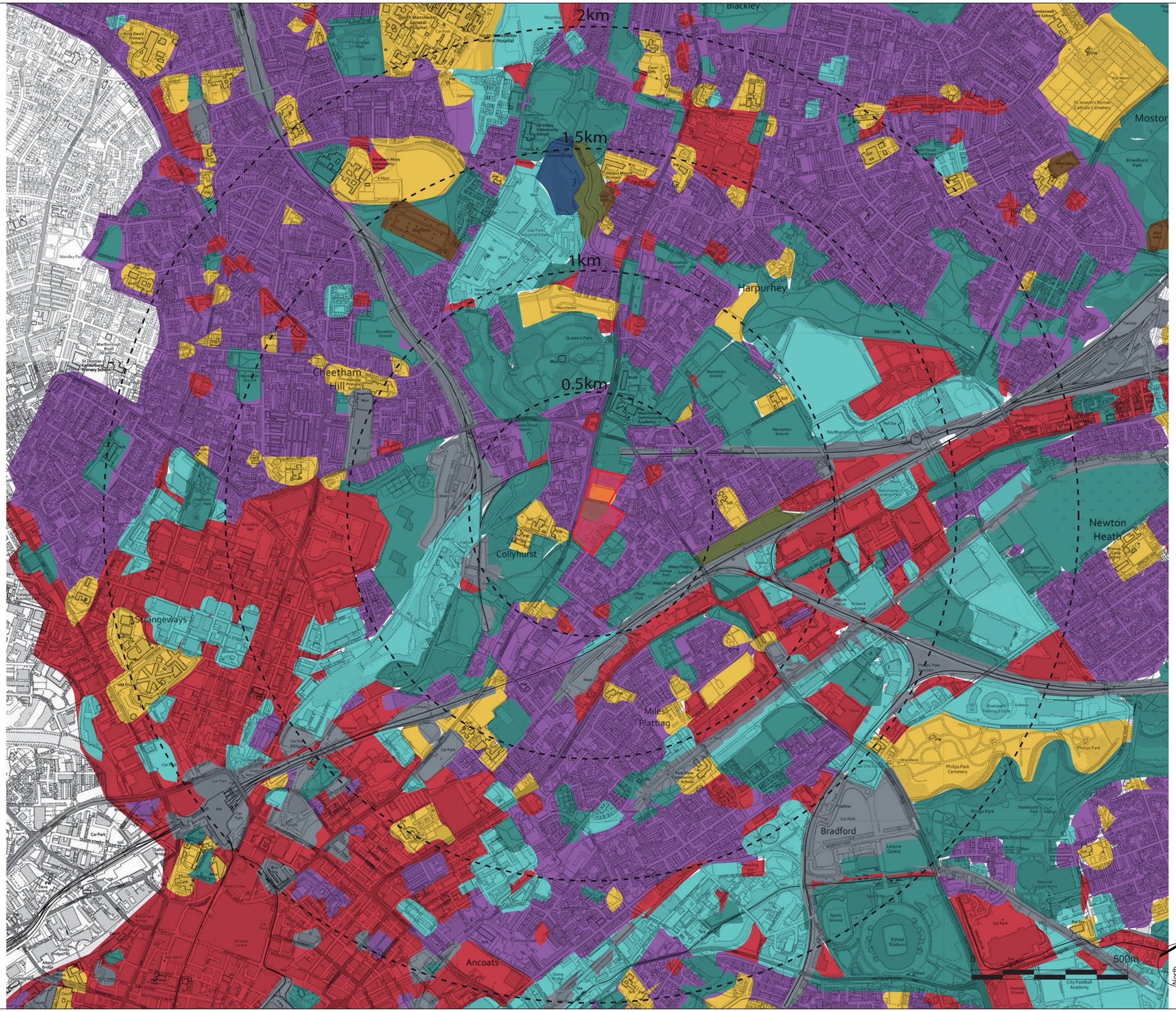

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Area measurements for indicative purposes only.

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- Application Site Boundary
- Commercial
- Residential
- Institutional
- Industrial
- Ornamental, Parkland and Recreational
- Communications
- Woodland
- Water Bodies
- Horticulture

Rev	Description	Date
A	PLANNING ISSUE	05.11.2020
-	INITIAL ISSUE	16.10.2020

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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.1 FIGURE 6:
URBAN HISTORIC LANDSCAPE CHARACTER AREAS

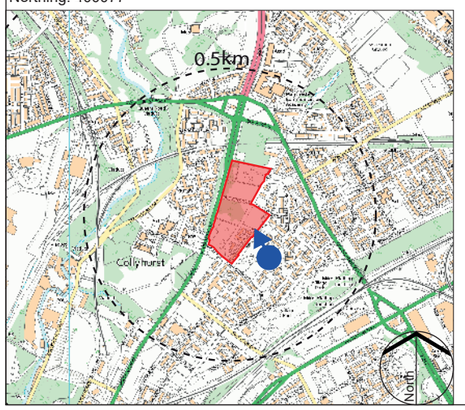
Issued By	Manchester	T: 0161 850 8101	
Scale	AS SHOWN	Drawn	ExA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1055

Revision
-

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385625
Northing: 400077



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 1: COLLYHURST PARK

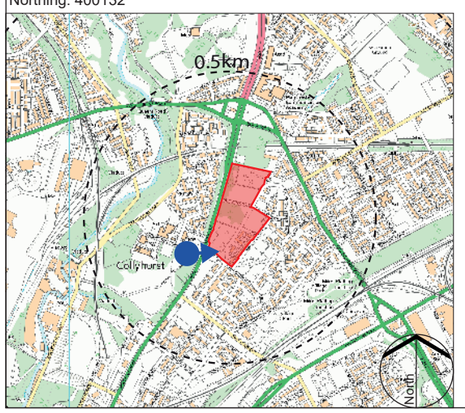
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	06.10.2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1030

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385444
Northing: 400132



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 2: EGGINGTON STREET - SAND HILLS PARK

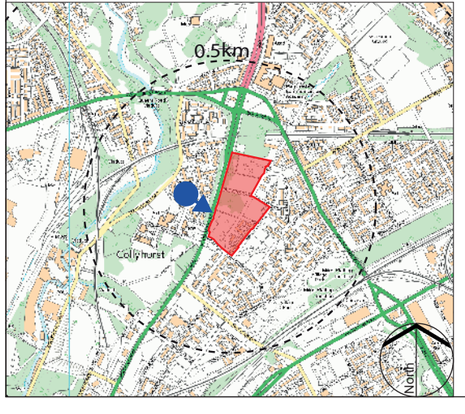
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1031

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385382
Northing: 400328



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 3: DALBURY DRIVE

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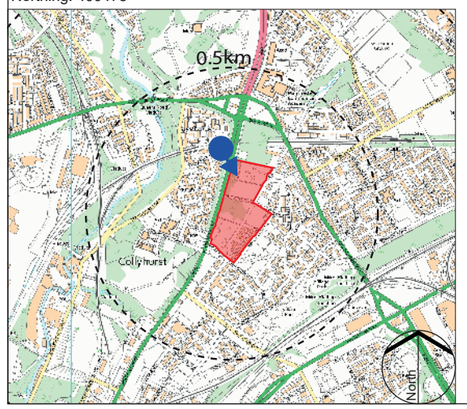
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1032

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385539
Northing: 400475



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 4: ROCHDALE ROAD AT GLENDOWER DRIVE

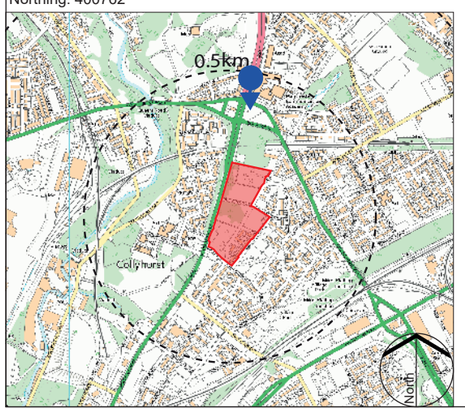
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1033

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385619
Northing: 400762



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 5: ROCHDALE ROAD AT PARK VIEW

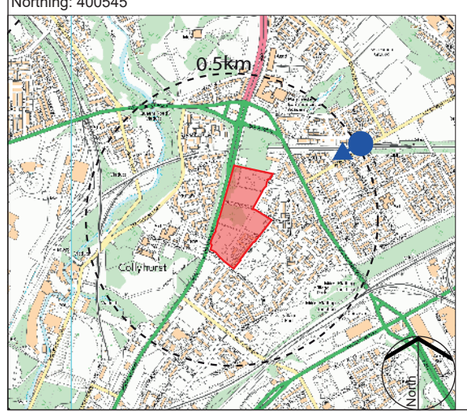
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1034

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 386076
Northing: 400545



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Project title
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Drawing title
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VIEWPOINT 6: MONSALL STREET, MONSALL METROLINK STATION

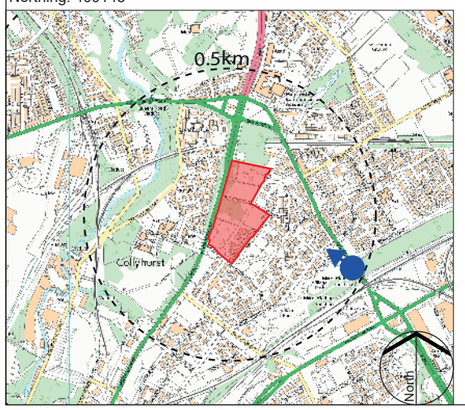
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1035

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385956
Northing: 400145



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 7: QUEENS ROAD

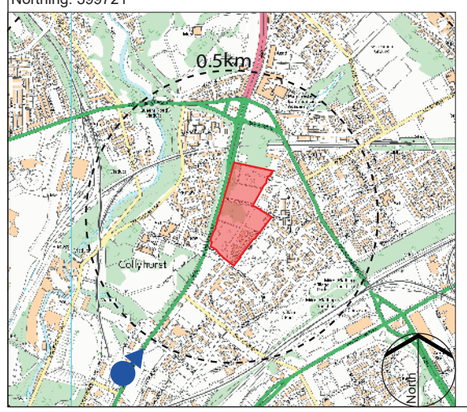
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1036

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385185
Northing: 399721



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 8: ROCHDALE ROAD AT ROACH COURT

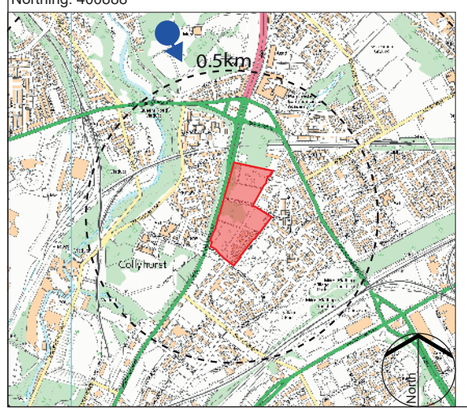
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1037

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385347
Northing: 400888



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Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.2
VIEWPOINT 9: QUEENS PARK

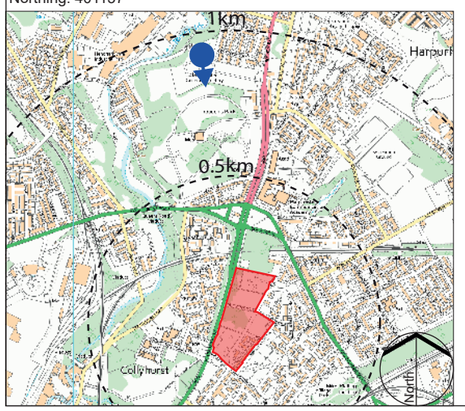
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1038

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 385384
Northing: 401137



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Project title
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Drawing title
ES APPENDIX 7.2
VIEWPOINT 10: MANCHESTER GENERAL CEMETERY

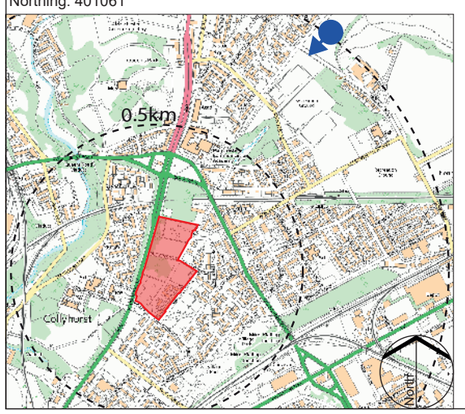
Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1039

Revision
A

Application Site Boundary

Date Taken: 2nd October 2020
Weather: Overcast
Easting: 386351
Northing: 401061



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Project title
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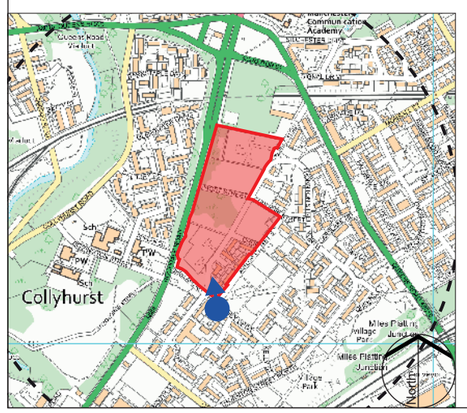
Drawing title
ES APPENDIX 7.2
VIEWPOINT 11: MOSTON VALE

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1040

Revision
A



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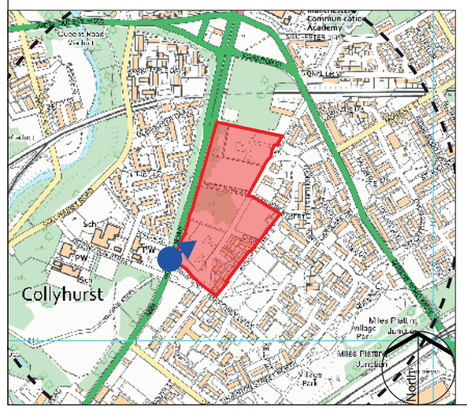
Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.3
SITE PHOTO A:
SHELLARD ROAD AT THORNTON STREET NORTH

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1020

Revision
A



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E-MAIL office@exteriorarchitecture.com
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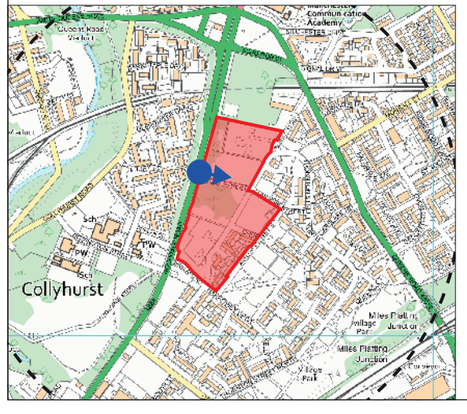
Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.3
SITE PHOTO B:
SHELLARD ROAD AT ROCHDALE ROAD

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1021

Revision
A



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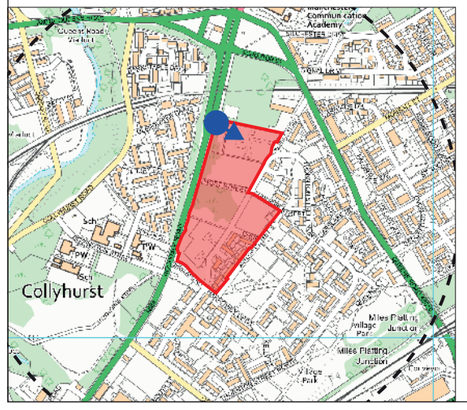
Project title
COLLYHURST VILLAGE

Drawing title
EA APPENDIX 7.3
SITE PHOTO C:
PAGET STREET AT ROCHDALE ROAD

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1022

Revision
A



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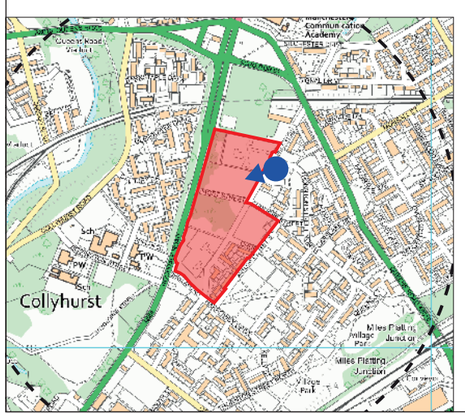
Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.3
SITE PHOTO D: FOOTPATH TO STRETTON CLOSE FROM ROCHDALE ROAD

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1023

Revision
A



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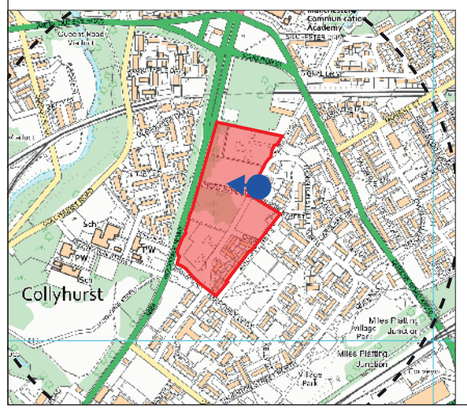
Project title
COLLYHURST VILLAGE

Drawing title
ES APPENDIX 7.3
SITE PHOTO E: NEEDWOOD CLOSE FROM STRETTON CLOSE

Issued By	Manchester	T: 0161 850 8101	
Scale	NTS	Drawn	EXA
Status	PLANNING	Checked	SL
Date	NOVEMBER 2020	Approved	JM

Drawing number
1994-EXA-XX-XX-RP-L-1024

Revision
A



EXTERIOR
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COLLYHURST VILLAGE

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ES APPENDIX 7.3
SITE PHOTO F:
PAGET STREET FROM THORNTON STREET NORTH

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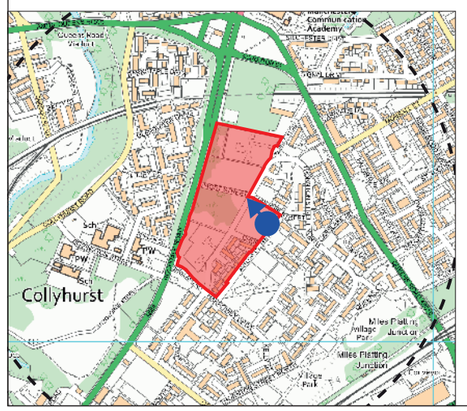

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Flood Risk Assessment

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Issued	09/12/2020

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1. Introduction

1.1 Project Background

Civic Engineers have been commissioned by Far East Consortium International Ltd (FEC) to provide a flood risk assessment and drainage advice to support a Full Planning Application for the construction of a proposed residential-led development and associated infrastructure at land east of Rochdale Road, Collyhurst, Manchester, known as Collyhurst Village.

1.2 Scope and Objectives

The assessment has been undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Government's Planning Practice Guidance to the National Planning Policy Framework (NPPF).

In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments. A drainage strategy will therefore be required as part of the Full Planning Application for the development as the proposals are considered 'major' development under the Town and Country Planning Order 2015.

This Flood Risk Assessment will:

- Investigate all potential risks of flooding to the site.
- Consider the impact the development may have elsewhere with regards to flooding.
- Consider proposals to mitigate any potential risk of flooding determined to be present; and,
- Consider drainage proposals to mitigate flood risk from the site.

This report reviews the following information:

- Environment Agency Online Flood mapping.
- UK Government Long Term Flood Risk Information for surface water flooding and reservoir flooding.
- Drainage and Utilities surveys
- Site Investigation Plans including Topographical Survey, Geotechnical Constraints Plan, Drainage and Utility Surveys, Groundwater Flood Map, Phase 1 Preliminary Assessment.

1.3 Development Proposals

Detailed planning permission for a residential-led, mixed-use development on land to the east of Rochdale Road, Collyhurst, Manchester, known as 'Collyhurst Village'. The development proposals will include:

- 244 residential dwellings;
- 155 sqm of commercial space;
- A new "Collyhurst Park";
- Access; and

- Associated infrastructure

The proposed site layouts are presented in **Appendix A.**

2. Existing Site Details

2.1 Location

The proposed development is located within the Collyhurst area of Manchester which is approximately 2.4km northeast of the city centre. The development will occupy a site, within the Collyhurst Village neighbourhood of Manchester City Council's (MCCs) Northern Gateway Strategic Regeneration Framework (SRF). The outline of the site is shown indicatively in Figure 1.

The site is bound by wooded area to the north, Burgess St and Anslow Close to the east. Shellard Road to the south and Rochdale Road to the west. Paget St crosses the site from east to west and Thornton St North runs through the site from north to south. National Grid Reference is 385601,400151 and nearest postcode is M40 7XH.

The site location is shown in Figure 1.

Figure 1 - Site location plan- Collyhurst Village

2.2 Topography

A topographical survey was undertaken by Survey Operations in December 2019 and indicates the following:

The site falls from the north-west to the south west. The lowest point is shown as approximately 53.00mAOD south west of the site whilst the highest point is approximately 62.3mAOD north of the site.

2.3 Geology

The online BGS records within the site are confidential/restricted access.

A Phase 1 Preliminary Risk Assessment (PRA) and Mining Risk Assessment was carried out by LK group in February 2020, investigating the existing ground conditions present on the Collyhurst Village site.

Geology is mapped as Till over Pennine Coal Measures in the north and central parts of the site. Penning Upper Coal Measures in the south and central part of the site and Worsley Delf Rock in the southern part of the site. A limited trial hole survey identified made ground on site comprising demolition rubble, plastics, metals, ash, and clinker. It is noted that given the history of the site, deep made ground may be present in localised areas of the site.

The site is above a Secondary A Aquifer. The PRA identified the following site-specific elements that need to be investigated further prior to any construction works being commenced:

- Deep made ground and/or obstructions remnant from previous developments including housing and former reservoir; and
- Potentially variable superficial deposits.

Due to the nature of the site and existing constraints including the presence of made ground; asbestos, hydorcarbons, other organic or inorganic contaminants and gas were identified on site. Therefore, due to the risk of contamination, infiltration is not currently recommended. The Phase 1: PRA is included in **Appendix B.**

2.4 Culverted Watercourses

Desk study and drainage surveys undertaken at the site have identified that there are two culverts that pass beneath the site, both of which are understood to be associated with the Moss Brook which is classed as a main river. One of the culverts is understood to enter the site from the north before turning ninety degrees and exiting towards Rochdale Road, the second culvert generally follows the line of Thornton Street North (previously known as Culvert Street) but mapping suggests that the culvert veers to the west as it reaches the southernmost part of the site, running across the street currently known as Overbrook Street. The approximate alignment is illustrated in Figure 2 - Approximate alignment of large diameter culverts beneath the site.

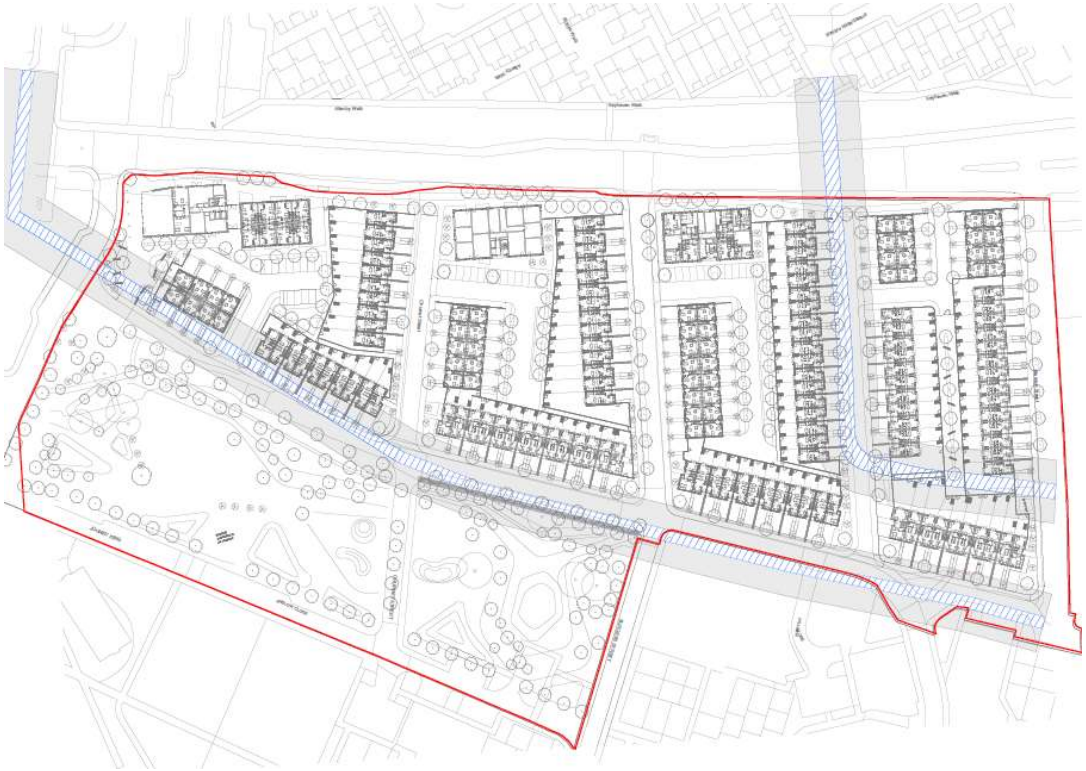


Figure 2 - Approximate alignment of large diameter culverts beneath the site.

Surveys suggest that the northern most culvert runs at a depth of approximately 24m as it passes beneath the site, and that the culvert along Thornton Street North runs at approximately 13m deep.

Consultation has been undertaken with the Environment Agency (EA) who advised that should any works be undertaken in the vicinity of the culverts, it will be important to ensure that no additional loading is placed on the culvert and that adequate access is provided for any future maintenance.

2.5 Existing Drainage

A drainage survey was carried out in May 2020 by Layer Surveys Ltd and the findings are included in **Appendix B**.

The drainage survey shows the following drainage networks located within the site boundary.

- A 225-300mm diameter surface water network running north-east, discharging into a manhole within Stretton Close;
- A 225-300mm diameter foul water network running north-east, discharging into a manhole within Stretton Close;
- There is a surface water network running within the culvert located in the northern parcel of the site, running in a west to east then northernly direction; and
- Two culverted watercourses run beneath the site at depths of between 10m and 20m. Both of these culverts are associated with the Moss Brook.

3. Relevant Policy and Guidance

3.1 National Planning Policy Framework

In February 2019 the Ministry of Housing, Communities and Local Government revised the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance which provides guidance on how flood risk should be assessed during the planning and development process.

The NPPF refers to the Flood Zones which are shown on the EA Flood Map, and establishes the range of uses which are appropriate, or compatible, land uses for each Flood Zone.

The Flood Zones can be summarised as follows:

Zone 1: Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any one year. (<0.1%);

Zone 2: Medium Probability. This zone comprises land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year;

Zone 3a: High Probability. This zone comprises land assessed as having 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year; and

Zone 3b: Functional Flood Plain. This zone comprises land where water must flow or be stored in times of flood. Strategic Flood Risk Assessments should identify this zone.

The 'Technical Guidance to the National Planning Policy Framework' defines the type and nature of different development classifications in the context of their flood risk vulnerability. The following extract outlines the NPPF Flood Risk Vulnerability Classifications.

More vulnerable

- Hospitals.
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste[6].
- Sites used for holiday or short-let caravans and camping, *subject to a specific warning and evacuation plan.*[7]

Less vulnerable

- Police, ambulance and fire stations which are *not* required to be operational during flooding.
- Buildings used for shops, financial, professional and other services,

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable

- Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use[3].
- Installations requiring hazardous substances consent[4]. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure")[5].

restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non–residential institutions not included in "more vulnerable", and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do *not* need to remain operational during times of flood.
- Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

Water-compatible development
- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, ***subject to a specific warning and evacuation plan***.

Figure 3 - Table 2 from Technical Guidance to the National Planning Policy Framework (2012)

The flood risk vulnerability and flood zone 'compatibility' has been summarised in Table 1 below.

Flood Risk Vulnerability Classification (see Table 2)		**Essential Infrastructure**	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**	**Water Compatible**
Flood Zone (See Table 1)	Zone 1	√	√	√	√	√
	Zone 2	√	Exception Test Required	√	√	√
	Zone 3a	Exception Test Required	×	Exception Test Required	√	√
	Zone 3b (functional floodplain)	Exception Test Required	×	×	×	√
	√ Development is appropriate × Development should not be permitted.					

Table 1 Flood Risk vulnerability and flood zone compatibility from NPPF Technical Guide

3.2 Site Specific NPPF Flood Risk Categorisation

To assess the NPPF flood risk classification for the site, the Government web based 'Flood Map for Planning' is reviewed, the flood map identifies the probability of flooding from rivers or sea (not taking into account the presence of flood defences). The Government web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the flood risks from rivers and seas, surface water and reservoirs.

From the EA 'Flood Map for Planning', shown in Figure 4 The proposed site sits within Flood Zone 1.

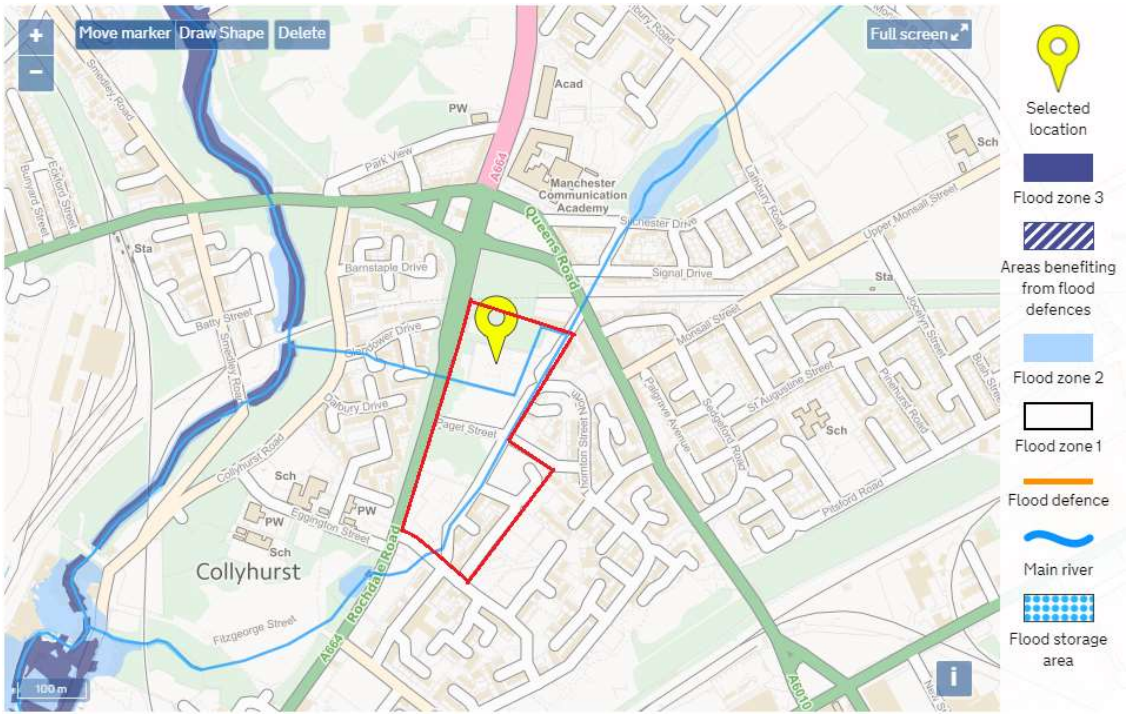


Figure 4 - EA Flood Map for Sites

3.3 Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA)

Manchester City, Salford City and Trafford Councils SFRA states:

> *"Development should aim for a minimum reduction in surface water runoff rates of 50% for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100-year storm event, considering climate change"*

And

> *"Manchester Strategic Housing Site - Collyhurst M0013*
>
> *The Irk and Moston Brook flow through this site. Moston Brook is in culvert for the reach through this site. The Flood Zone maps show that there is limited flood risk associated with this culvert at the site, but the risk of blockage would need to be explored in more detailed studies. Flood waters are predicted to remain in bank for the 1 in 100 year and 1 in 100 year plus climate change event. River waters exceed bank top in the 1 in 1000 year event but the flood extent is minimal with the effect restricted to a localised area around the Irk."*
>
> *"Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event."*

Manchester City Council's and Trafford Council's Sustainability Appraisal have a flood risk objective to *'Reduce the impacts of climate change'*, with the sub-objective to, '*minimise risk of flooding and increase use of SuDS*'. There are two indicators for Manchester and Trafford:

- New developments incorporating SuDS

The key objectives of a SFRA are to:

- Investigate and identify the extent and severity of flood risk to the area at present and in the future, under the terms of PPS25.
- Contribute to the Council's Sustainability Appraisal (SA) and LDF.
- Enable the Council to apply the Sequential Test and the Exception Test.
- Provide strategic flood risk guidance and advice to planners and developers.
- Help LPAs to identify specific locations where further and more detailed flood risk data and assessment work is required. This includes the scope for Surface Water Management Plans (SWMPs) and/or Water Cycle Studies (WCSs).
- Identify the level of detail required for site-specific FRA's.

4. Flood Risk Assessment

The potential sources of flooding to the development have been assessed and are discussed below.

4.1 Rivers and Sea Flooding

From the Government flood map for planning:

- Where a site is in a dark blue shaded zone, this indicates that the site is within an area of high flood risk where there is a chance of flooding of greater than 1 in 30 (3.3%).
- Where a site is in a blue shaded zone, this indicates that the site is within an area of medium flood risk where there is a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%).
- Where a site is in a lighter blue shaded zone, this indicates that the site is within an area of low flood risk where there is a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).
- Where a site is not shaded, this indicates that the site is within an area of very low flood risk where there is a chance of flooding of less than 1 in 1000 (0.1%).

Flood risk to the site from rivers and seas is indicated in Figure 5. The site is within an unshaded area and therefore has Very Low risk of flooding from rivers or sea.

Figure 5 - EA Rivers & Seas Flood Risk Map

The culverted watercourse is between 10-20m deep beneath the site and there are no known instances of flooding associated with these culverts as such the risk of flooding from the culverted watercourses is Low.

It is the riparian responsibility of the landowner to maintain free flow through the culverted structure.

4.2 Reservoir Flooding

Reservoir flooding is extremely unlikely to happen and there has been no recorded loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.

Flood risk to the site from reservoirs is indicated in Figure 6 and the site is within an area classified as outside the maximum extent of flooding.

Figure 6 - Reservoir Flood Risk Map

4.3 Groundwater Flooding

From research attained from the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA Ground water flooding maps the development does not appear to be in an area at risk of flooding from ground water. Groundwater map extract from the SFRA is included in **Appendix B.**

4.4 Public Sewers, Highway Drainage Flooding and Infrastructure Failure

As mentioned within Section 2.2 of this report, a drainage survey is included in **Appendix B**. There are a number of surface and foul water sewers within the vicinity of the site.

Providing Untied Utilities and MCC maintain their drainage assets in the surrounding area of the site, the risk of flooding to the proposed development site from public sewer or highway drainage is Low.

4.5 Surface Water Flooding to the Site

Surface water flooding can be caused when rainwater, during extreme rainfall events, does not drain away through the normal drainage system or soak into the ground. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

Surface water flooding is dependant primarily on topography which dictates either the flow path of overland flow which is not contained within public sewers, or areas in which ponding may occur.

Surface water flooding is more difficult to predict than the risk of flooding from Rivers or Sea as it is dependent on the amount of rain which will fall in a very localised area, the specific topography of that region and the capacity and functionality of the drainage network within that section.

From the UK Government's Flood Risk from Surface Water (extent of flooding) map.

- Where a site is in a dark blue shaded zone, this indicates that the site is at high risk of flooding where there is a chance of flooding of greater than 1 in 30 (3.3%).
- Where a site is in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding where there is a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%).
- Where a site is in a light blue shaded zone; this indicates that the site is at low risk of flooding where there is a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).
- Where a site is in a white (unshaded) area; this indicates that the site is at very low risk of flooding where there is a chance of flooding of less than 1 in 1000 (0.1%).

The extent of flooding to the site from surface water is indicated in Figure 7 and the majority of the site is at very low risk and some low to high risk of surface water flooding.

Figure 7 - Surface Water Flood Risk Map

4.6 Surface Water Flooding from the Site

Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. The proposed surface water drainage network shall be designed to not flood for the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.

The development has the potential to increase flood risk where additional run-off from proposed roads and paved areas are discharged freely into the downstream drainage networks. It is therefore

encouraged to propose permeable areas, landscaping areas and incorporate sustainable drainage features utilising infiltration or attenuation where possible.

The proposed site-wide drainage system is intended to manage and mitigate the potential surface water and groundwater flood risk identified. Any ponding and flow routes will be addressed within the drainage strategy. A detailed assessment of the proposed surface flows is carried out within the drainage strategy within Section 5 of this report.

4.7 Summary of Flood Risk

From the evidence collated and subsequent negotiations, the flood risk proposed to the development can be summarised as follows:

- Rivers and Sea – Very Low Risk;
- Reservoir –Very Low Risk;
- Groundwater – Very Low Risk;
- Public Sewers – Low Risk; and
- Surface Water – Very Low Risk, with some areas at low to high risk.

5. Works in the Vicinity of the Culverted Watercourse

Layer surveys carried out surveys of the culverts in June 2020. This are included in **Appendix B**. The surveyor used a deep bore SONDE to plot the location. Due to the depth the surveyor placed a 1.5m tolerance on the location (0.75m either side of the outside wall).

The foundation design near to the culverts will be piled so has to take the loads below the culvert level. Where the buildings are close to the culvert a cantilever ground beam off the piles will be implemented.

The existing manholes will not be altered and left in the current location so as not to disturb accessibility. No units will be built over the culvert.

6. Surface Water Management Strategy

6.1 Existing Site Drainage

The status of the existing site drainage has been confirmed within the drainage survey records, included in **Appendix B**. There are (assumed) existing United Utilities (UU) surface water and foul water networks located within Rochdale Road and Stretton Close. Catchment plans for the existing site are included in **Appendix E**.

6.2 Drainage Hierarchy Points of Discharge

The NPPF Planning Practice Guidance Paragraph 080 states that:

"Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. *into the ground (infiltration).*
2. *to a surface water body.*
3. *to a surface water sewer, highway drain, or another drainage system.*
4. *to a combined sewer."*

Infiltration

Infiltration is not considered feasible for this development due to the historic nature of the site and potential contamination sources affecting the site where identified as heavy metals, PAH's, Sulphate, Hydrocarbons, other organic or inorganic contaminates and gas may pose a contamination risk. A Site Investigation report is included in **Appendix B**.

Water Body

There are two culverts that pass beneath the site, both of which are understood to be associated with the Moss Brook. One of the culverts is understood to enter the site form the north before turning 90 degrees and existing towards Rochdale Road. The second culvert generally follows the line of Thornton Street North, mapping suggests that the culvert veers to the west as it reached the southernmost part of the site, running across the street currently known as Overbrook St. The culverts are understood to vary in depth between 10m-20m below the site.

The River Irk is approximately 240m to the west of the site.

The Rochdale canal is approximately 900m to the southeast of the site.

Surface Water Sewer

There are a number of surface water networks within and in the vicinity of the site.

Combined Sewer

No combined sewers have been identified within the site.

Any connection to the public sewer network will be subject to a formal agreement with the sewerage provider under Section 106 of the Water Industry Act 1991.

Summary

The surface water discharge options are summarised below in Table 2.

Table 2 - Summary of Surface Water Disposal

Surface Water Disposal Method	Potential	Description
Infiltration	✗	Unfeasible due to made ground contamination risk, Ground Investigation included in Appendix B.
Water Body	✓	There are culverts within the immediate vicinity of the site, however these are too deep, and it is not feasible to discharge surface water here. It is proposed to discharge to the existing UU network which ultimately discharges to the culvert beneath Thornton Road.
Surface Water Sewer	✓	It appears that the existing UU network discharges into the culvert beneath Thornton Rd. It is therefore proposed to discharge to the surface water sewer network which then in turn discharges to the watercourse beneath the site.
Combined Water Sewer	✗	There is no combined network within vicinity of the site.

6.3 Post-development Runoff and Attenuation

The site is defined as brownfield through planning as it has previously been developed, therefore, it is proposed to restrict run off to brownfield discharge rates including a 50% betterment in line with the requirements of the SFRA. Catchment plans for the proposed sites are included in **Appendix E**. Details of proposed runoff rates are presented in Table 3 - Proposed Flow Restrictions and Estimates Storage Requirements.

Table 3 - Proposed Flow Restrictions and Estimates Storage Requirements

Catchments	Total Area (m^2)	Impermeable Area (80%) (m^2)	Permeable Area (20%) (m^2)	Existing Qbar Run Off rates	Existing Brownfield Discharge rates	Post Development Discharge rate (Brownfield 50% Betterment) (l/s)	Attenuation Volume: 1:100+40%CC Requirements (m^3)
Catchment A	7331m^2	5865 m^2	1466 m^2	N/A	34.8 l/s	17.4 l/s	225 m^3
Catchment B	6627m^2	5302 m^2	1325 m^2	5.1l/s	N/A	3.8 l/s (Greenfield Qbar)	212 m^3
Catchment C	7797m^2	6238 m^2	1559 m^2	5.2l/s	N/A	5.2 l/s (Greenfield Qbar)	251 m^3
Catchment D	7687m^2	6150 m^2	1537 m^2	N/A	45 l/s	22.5 l/s	246 m^3

In July 2020, the EA released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Table 4 demonstrates the climate change allowances with central and upper end allowances being considered.

Table 4 - Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Based on the nature of the development, a lifespan in excess of 60 years is anticipated. The potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, the design will consider an allowance of 40% climate change on peak rainfall intensity for calculations.

In restricting the flows from the development site to the brownfield with 50% betterment rate there will be a requirement to provide attenuation to accommodate flows up to the critical 1 in 100-year event with a climate change allowance of 40%. The purpose of the attenuation being to maintain operation of the system during the 1 in 1yr, 1 in 30yr and the 1 in 100yr (plus climate change) storm events.

The required volume of attenuation has been calculated using Micro Drainage based on the proposed development areas. Proposed attenuation volumes are as detailed in Table 3 above.

6.4 Sustainable Drainage Systems (SuDS)

Section 1.1 of the SuDS Manual (Ciria C753) states the following:

> *"Sustainable drainage systems (SuDS) can deliver multiple benefits.*
>
> *Surface water is a valuable resource, and this should be reflected in the way it is managed and used in the built environment. It can add to and enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate.*
>
> *The philosophy of sustainable drainage systems is about maximising the benefits and minimising the negative impacts of surface water run-off from developed areas.*
>
> *The SuDS approach involves slowing down and reducing the quantity of surface water runoff from a developed area to manage downstream flood risk and reducing the risk of that runoff causing pollution. This is achieved by harvesting, infiltrating, slowing, storing, conveying and treating runoff on site and, where possible, on the surface rather than underground. Water then becomes a much more visible and tangible part of the built environment, which can be enjoyed by everyone."*

The SuDS Manual describes the four pillars of SuDS design as Water Quality, Water Quantity, Amenity and Biodiversity as illustrated in Figure 8 below.

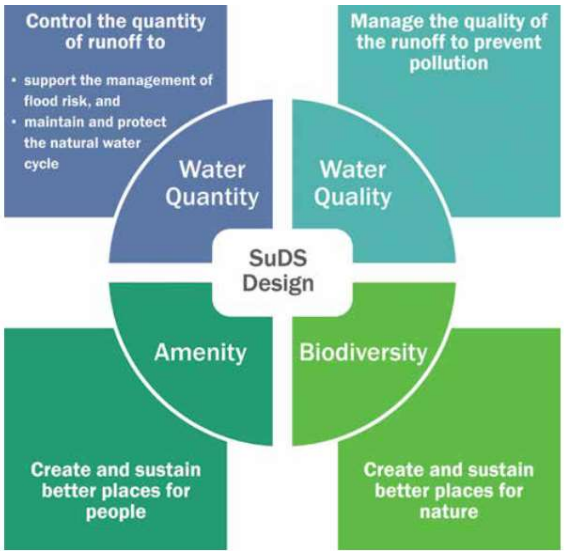


Figure 8: Sustainable Development Objectives (Representation of Figure 2.1 of The SuDS Manual)

The drainage strategy is proposed to include source control measures including nature based solutions such as raingardens and tree pits. Source control measures will discharge to a below ground piped network which will then discharge to a retention basin within the proposed Park or other site level SuDS features. Ultimately it is proposed that the surface water will discharge to the culverted watercourse via the UU network beneath Thornton Street North.

Surface Water Drainage Strategy drawings have been produced for the proposed development and are included in **Appendix E** of this report showing indicative drainage connection points and layouts incorporating attenuation and SuDS features.

7. Proposed Foul Water Drainage

Based on currently available information the proposal includes collecting the foul drainage from each building via a conventional piped system and running to a connection to the existing United Utilities network within Thornton Street at an unrestricted rate. Preferred connection/s to be confirmed and agreed with UU.

Any connection to the public sewer is subject to formal agreement with United Utilities under Section 106 of the Water Industry Act 1991. The proposed drainage strategy plan is enclosed in **Appendix E.**

8. Conclusion

The development is located Flood Zone 1 and is within the low/no risk area for river, sea, groundwater, and reservoir and low risk for surface water. The site is defined as brownfield through planning as it has previously been developed, therefore, it is proposed to restrict run off to brownfield including a 50% betterment rates for the new development.

Collyhurst Village is classed as a Brownfield site as it is the location of a former reservoir which was subsequently filled in and replaced with terraced housing, which later where replaced by larger detached properties and other facilities including a Day nursery. As time progressed the site was cleared, and a care home was situated to the north of Paget St with further housing delivered.

Online BGS records are confidential/restricted. The PRA concludes that the sites geology are generally defined as follows:

- Deep made ground and/or obstructions remnant from previous developments including housing and former reservoir.
- Potentially variable superficial deposits.

Due to the nature of the site and existing constraints including the presence of made ground, asbestos, hydorcarbons other organic or inorganic contaminants and gas were identified on site. Therefore, due to the risk of contamination, infiltration is not currently recommended. Phase 1: Preliminary Risk assessments is included in **Appendix B**.

Foul Water flows will also be conveyed using a traditional pipe system before discharging to the existing United Utilities sewage system present in the area. The discharge point is to be agreed and confirmed with UU.

The LLFA has requested that catchment A and D is restricted to brownfield runoff rates, with catchments B and C restricted to greenfield runoff rates.

For the purposes of the drainage strategy, the surface water flow from the site catchments A and D will be restricted to 1 in 1 year Brownfield rate with a 50% betterment. Whilst catchments B and C will be restricted to greenfield runoff rates. The proposed surface water system has been designed to accommodate the critical 1 in 100 year plus 40% climate change event.

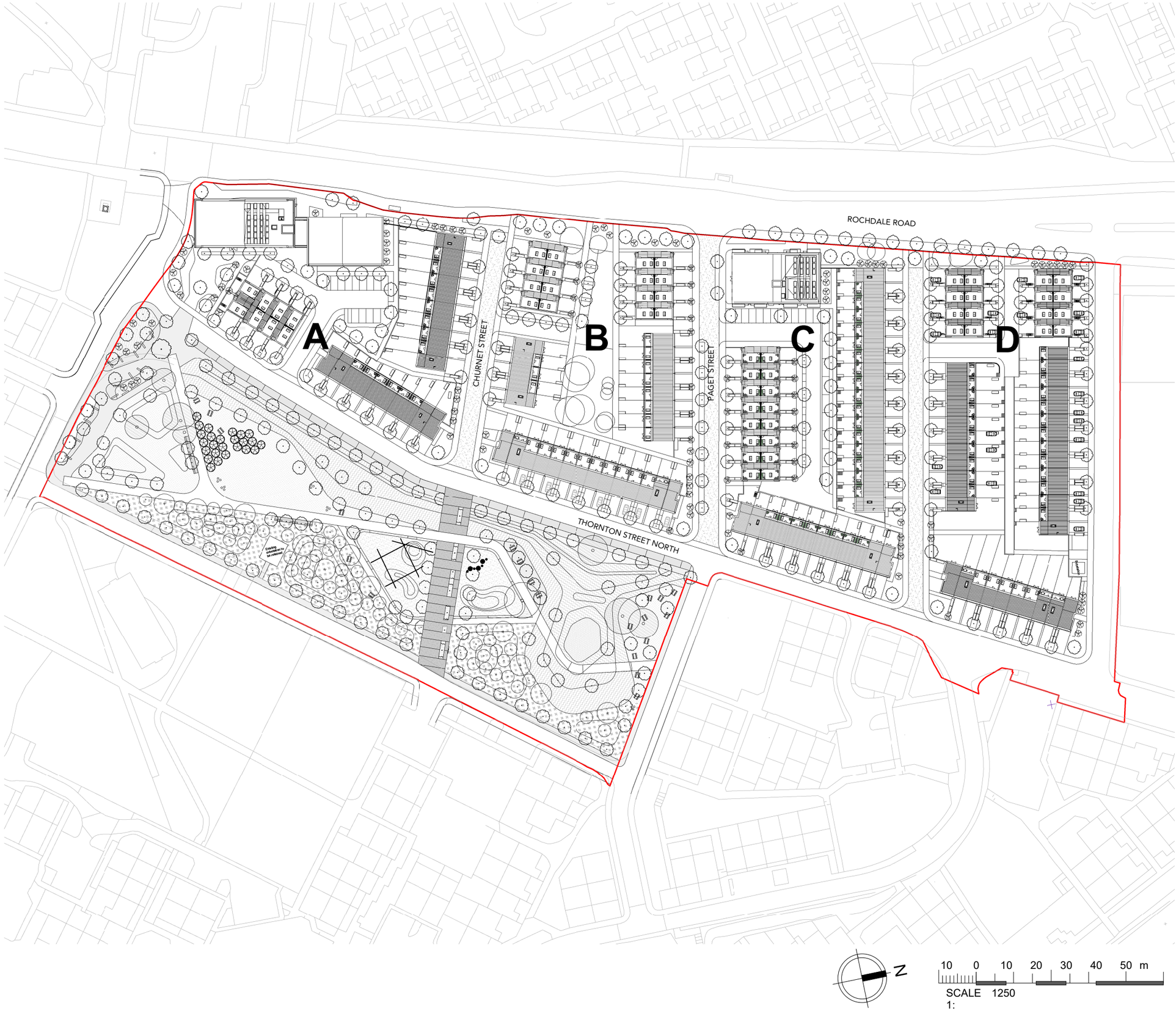
The nearest waterbody to the site is the river Irk is approximately 240m west of the sites and Rochdale canal is approximately 900m east of the sites. It is not feasibly to directly discharge surface water to either of these watercourses.

A Pre-Development Enquiry has been issued to both UU and the LLFA to confirm preferred points of connection and allowable discharge rates. Response and minutes to meeting held with the LLFA are included in **Appendix C.**

Civic Engineers

APPENDIX A

Proposed Site Plan



Note:
Do not scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

Plot A

Houses:	28
No. of Apartments:	50
Apartment Storeys:	6 Storeys
Apartment Building Height:	23.100m (Top of Lift Overrun)

Plot B

Houses:	43

Plot C

Houses:	46
No. of Apartments:	26
Apartment Storeys:	5 Storeys
Apartment Building Height:	17.325m (Top of Lift Overrun)

Plot D

Houses:	51

Total **244**

Note: Tallest housetype 4 storeys (top level roof garden).
10.8m to ridge height.

Rev	Date	Intls	Details
P6	04/12/20	LH	Updated to incorporate FEC Comments
P5	02/12/20	LH	Updated 2 Apartment Block Scheme
P4	27/10/20	LH	Red Line Boundary Updated
P3	30/09/20	LH	EIA Issue
P2	11/09/20	LH	EIA Issue
P1	17/04/20	GC	Stage 2 Issue
P0	09/04/20	GC	Tenure Update

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Project Title	Collyhurst Housing
Client	FEC
Location	Manchester
Drawing Title	Proposed Site Location Plan

Date	04/12/2020 13:55:32	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8871-BA-MP-00-DR-A- (04)706- P6

APPENDIX B

Surveys & Maps

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Note:

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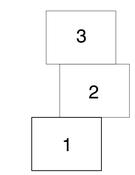
JM1	385591.98	400216.67	54.67
JM2	385636.09	400298.16	56.10
JM5	385665.02	400353.03	57.54
JC2	385617.53	400139.54	56.44
JC3	385668.55	400139.26	56.44
JC4	385554.33	400079.72	56.28
JC5	385547.79	400109.86	55.85
JC6	385535.33	400150.74	55.38

STANDARD REFERENCE & ABBREVIATIONS

(AM)..... Assumed Route	IL..... Invert Level
AB..... Air Brick	IP..... Inlet Pipe
AV..... Air Valve	KO..... Kerb Outlet
B/W..... Barbed Wire	LB..... Letter Box
BAR..... Barrier	LP..... Lamp Post
BE..... Bellaha Beacon	MB..... Multi-Girth
BH..... Borehole	MH..... Manhole
BL..... Bed Level	MKR..... Marker
BO..... Bollard	MP..... Mooring Point
BS..... Bus Stop	NP..... Street Name Plate
BT Box..... British Telecom Box	O/H..... Overhead
BT..... Open Paling	O/P..... Ordnance Survey Bench Mark
BWTR..... Brick Retaining Wall	OC..... Overhead Electric Wire
BW..... Brick Wall	OP..... Outfall Pipe
C/B..... Close Boarded	OSBM..... Ordnance Survey Bench Mark
C/I..... Corrugated Iron	OT..... Overhead Telecom Wire
C/P..... Chestnut Paling	P/C..... Post & Chain
CB..... Control Box	P/R..... Post & Rail
CBW..... Concrete Block Wall	P/W..... Post & Wire
CCTV..... Closed Circuit TV	PAV..... Paving
CD..... Cable Duct	PB..... Pillar Box
CEL..... Cellar Light	PC..... Pedestrian Crossing
CH..... Chain Link	PP..... Petrol Pump
CHY..... Chimney	PT..... Post or Pillar
CL..... Cover Level	RE..... Rodding Eye
CM..... Cable Marker	RS..... Road Sign
COL..... Colum	RTW..... Retaining Wall
CONC..... Concrete	RWP..... Rain Water Pipe
CP..... Catch Pit	SAP..... Sapling
CRTW..... Concrete Retaining Wall	SL..... Ramp Level
CTV..... Cable Television	SOF..... Soffit Level
CUL..... Culvert	SP..... Sign Post
CW..... Concrete Block Wall	SPL..... Springing Level
DC..... Drainage Channel	SWTR..... Stone Retaining Wall
DPC..... Damp Proof Course	SV..... Stop Valve (unspecified)
DR..... Drain	SVP..... Soil Vent Pipe
DSW..... Dry Stone Wall	SW..... Stone Wall
ECP..... Electricity Cable Pit	TAC..... Tactile Paving
EIC..... Electricity Inspection Cover	TB..... Traffic Bollard
EJ..... Expansion Joint	TBM..... Temporary Bench Mark
EJB..... Electricity Junction Box	TCB..... Telephone Call Box
EL SUB STN..Electricity Sub Station	TFB..... Taken From Records
EL..... Exess Level	TIE..... Anchor Point (Boats/Poles)
ELB..... Electricity Box	TL..... Traffic Light
EP..... Electricity Pole	TLB..... Traffic Light Control Box
ER..... Earth Rod	TM..... Ticket Machine
ETL..... Electricity Transmission Line	TWC..... Tarmac
FB..... Flower Bed	TP..... Telecommunications Pole
FH..... Fire Hydrant	TRIT..... Trial Pit
FL..... Floor Level	TS..... Trash Screen
FP..... Flagpole	U/C..... Under Construction
GY..*..... Girth (of tree)	U/G..... Underground
GL..... Gulley	UTL..... Unable to Life (BM,IE etc)
GNB..... Gabion	UTS..... Unable to Survey
GUP..... Gas Inlet Pipe	VDP..... Vehicle Detector Pad
GWM..... Gas Marker	VP..... Vent Pipe
GST..... Gas Stop Tap (Domestic)	W/B..... Wire Mesh
GSV..... Gas Stop Valve (Mains)	WL..... Water Level
HSE..... Housing	WM..... Water Meter
HT..... Height	WO..... Wash Out
HV..... High Voltage	WP..... Waste Pipe
I/R..... Iron Railing	WST..... Water Stop Tap (Domestic)
IC..... Inspection Cover	WSV..... Water Stop Valve (Mains)

Sheet Layout



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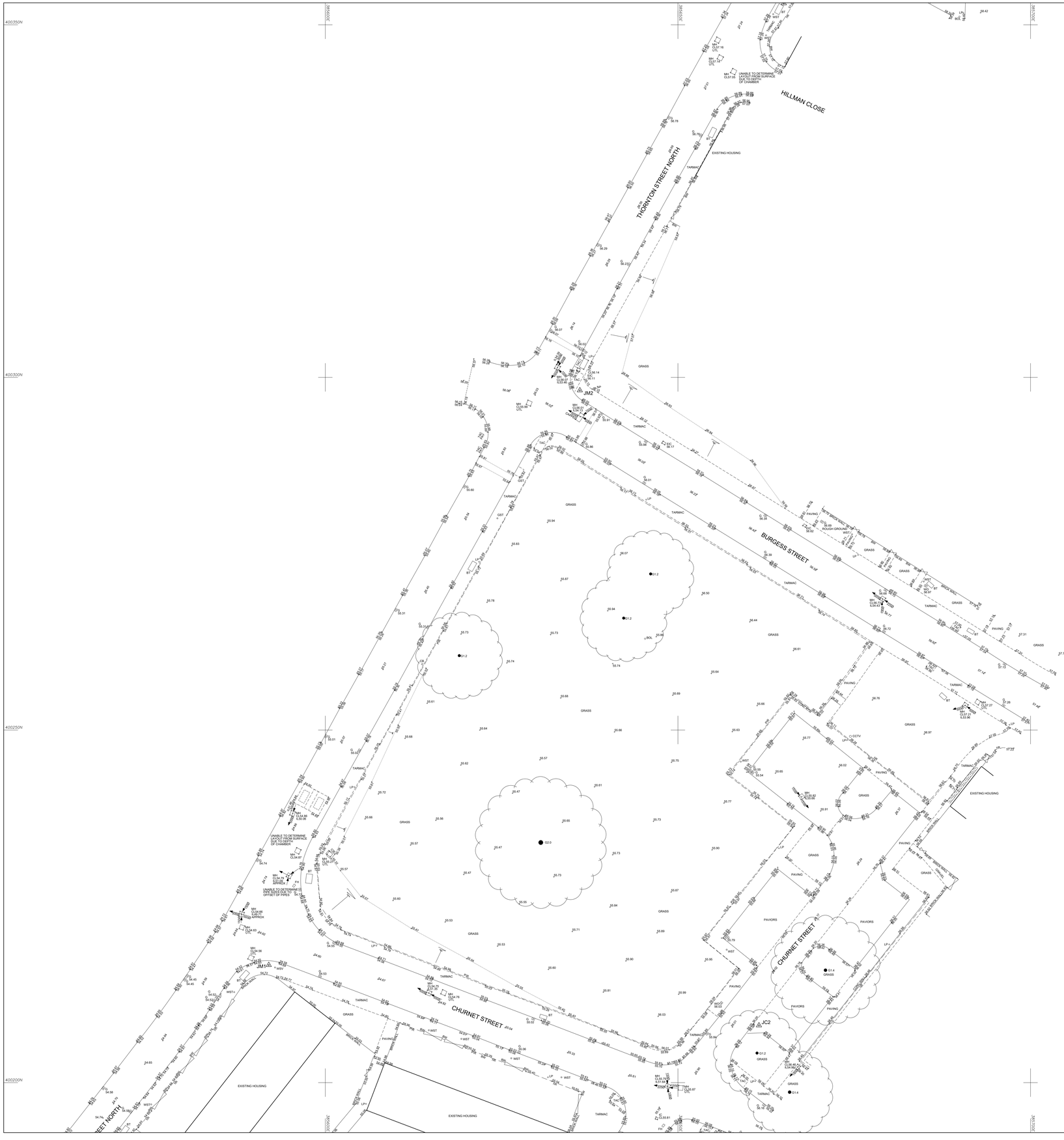
Email: mail@survops.co.uk – www.survops.co.uk

Client
Far East Consortium International Limited

Drawing Title
Topographical Survey of Land at:
Collyhurst Survey Area 2
Manchester
Sheet 1 of 3

Scale(s)	1:200	Surveyor	JM
Date	Mar 20	Drawn	OKS
Job Number	20C045	Checked	TP

Sheet Size & Drg Number & Revision
A0 20C045/001



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(AM).....Assumed Route
AB.....Air Brick
AV.....Air Valve
B/W.....Barbed Wire
BAR.....Barrier
BS.....Bollahs Beacon
BH.....Borehole
BL.....Bed Level
BOL.....Bollard
BS.....Bus Stop
BT Box.....British Telecom Box
BT.....British Telecom IC
BRTK.....Brick Retaining Wall
BW.....Brick Wall
C/B.....Close Boarded
C/I.....Corrugated Iron
C/P.....Chestnut Paling
CB.....Control Box
CBW.....Concrete Block Wall
CCTV.....Closed Circuit TV
CD.....Cable Duct
CEL.....Cellar Light
CHL.....Chain Link
CHY.....Chimney
CL.....Cover Level
CM.....Cable Marker
COL.....Column
CONC.....Concrete
CP.....Catch Pit
CRTN.....Concrete Retaining Wall
CTV.....Cable Television
CUL.....Culvert
CWA.....Concrete Block Wall
DC.....Drainage Channel
DPC.....Damp Proof Course
DR.....Drain
DSW.....Dry Stone Wall
ECP.....Electricity Cable Pit
EIC.....Electricity Inspection Cover
EJ.....Expansion Joint
EJB.....Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL.....Eaves Level
ELB.....Electricity Box
EP.....Electricity Pole
ER.....Earth Rod
ETL.....Electricity Transmission Line
FB.....Flower Bed
FH.....Fire Hydrant
FL.....Floor Level
FY.....Flagpole
G/.....Gulley (if trap)
G.....Gulley
GAB.....Gabion
GIP.....Gas Inlet Pipe
GMM.....Gas Marker
GOT.....Gas Stop Tap (Domestic)
GSV.....Gas Stop Valve (Mains)
HSE.....Housing
HT.....Height
HV.....High Voltage
I/R.....Iron Railing
IC.....Inspection Cover
IL.....Invert Level
IP.....Inlet Pipe
KO.....Kerb Outlet
LB.....Letter Box
LP.....Lamp Post
MS.....Multi-Girth
MH.....Manhole
MKR.....Marker
MP.....Mooring Point
NP.....Street Name Plate
O/H.....Overhead
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PT.....Post or Pillar
RE.....Rodding Eye
RS.....Road Sign
RTN.....Retaining Wall
RWP.....Rain Water Pipe
SAP.....Sapling
SL.....Sump Level
SOF.....Soffit Level
SP.....Sign Post
SPL.....Springing Level
SRTN.....Stone Retaining Wall
SV.....Stop Valve (unspecified)
SVP.....Soil Vent Pipe
SW.....Stone Wall
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TB.....Traffic Bollard
TBM.....Temporary Bench Mark
TCB.....Telephone Call Box
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TIE.....Anchor Point (Boats/Poles)
TL.....Traffic Light
TLB.....Traffic Light Control Box
TM.....Ticket Machine
TNE.....Tarmac
TP.....Telecommunications Pole
TPIT.....Trial Pit
TS.....Trade Screen
U/C.....Under Construction
U/G.....Underground
UTL.....Unable to Lift (BM,IC etc)
UTS.....Unable to Survey
VDP.....Vehicle Detector Pad
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Sheet Layout

3
2
1

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Far East Consortium International Limited

Drawing Title
Topographical Survey of Land at:
Collyhurst Survey Area 2
Manchester
Sheet 2 of 3

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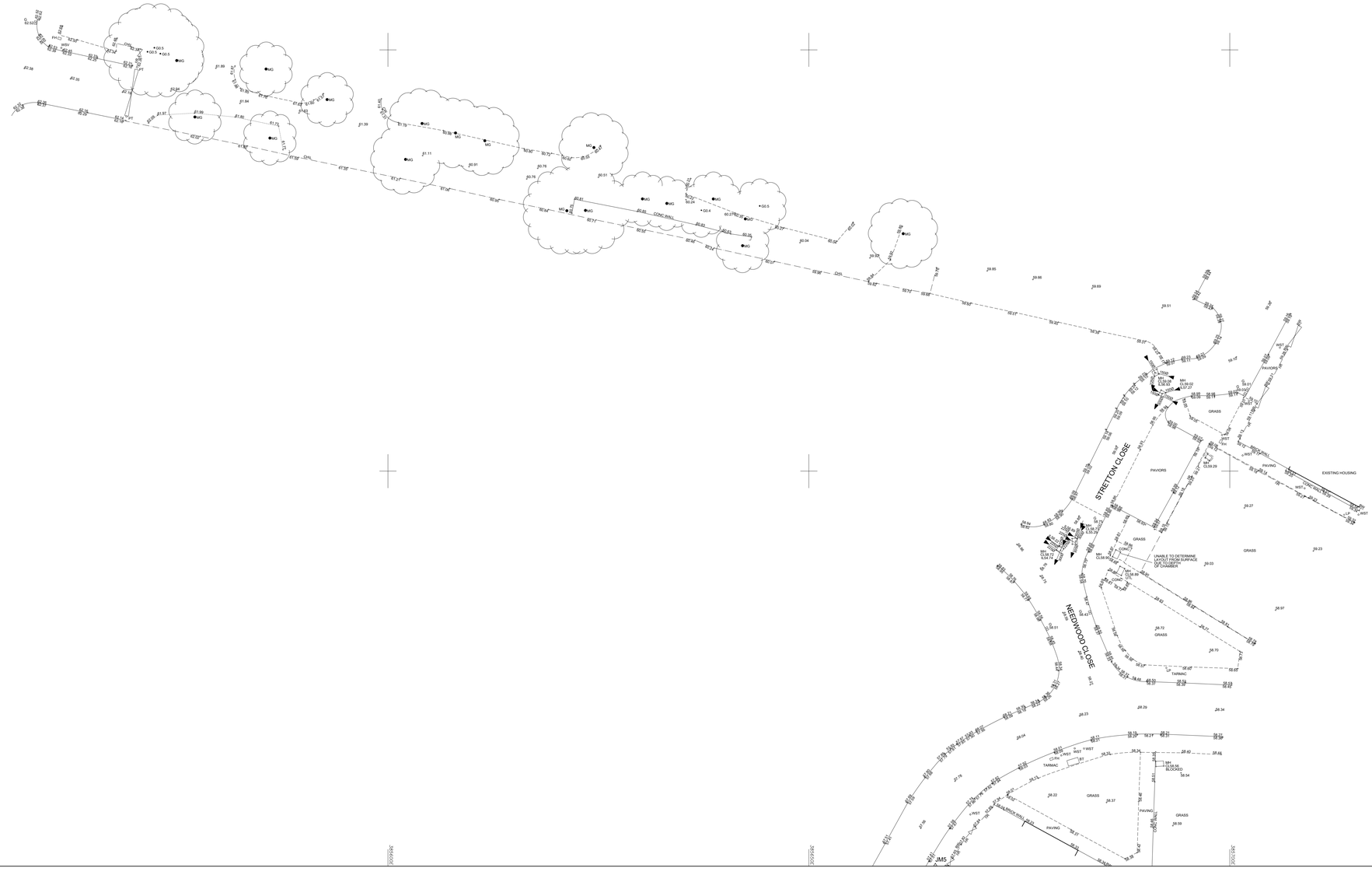

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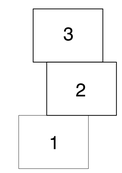
Sheet Layout



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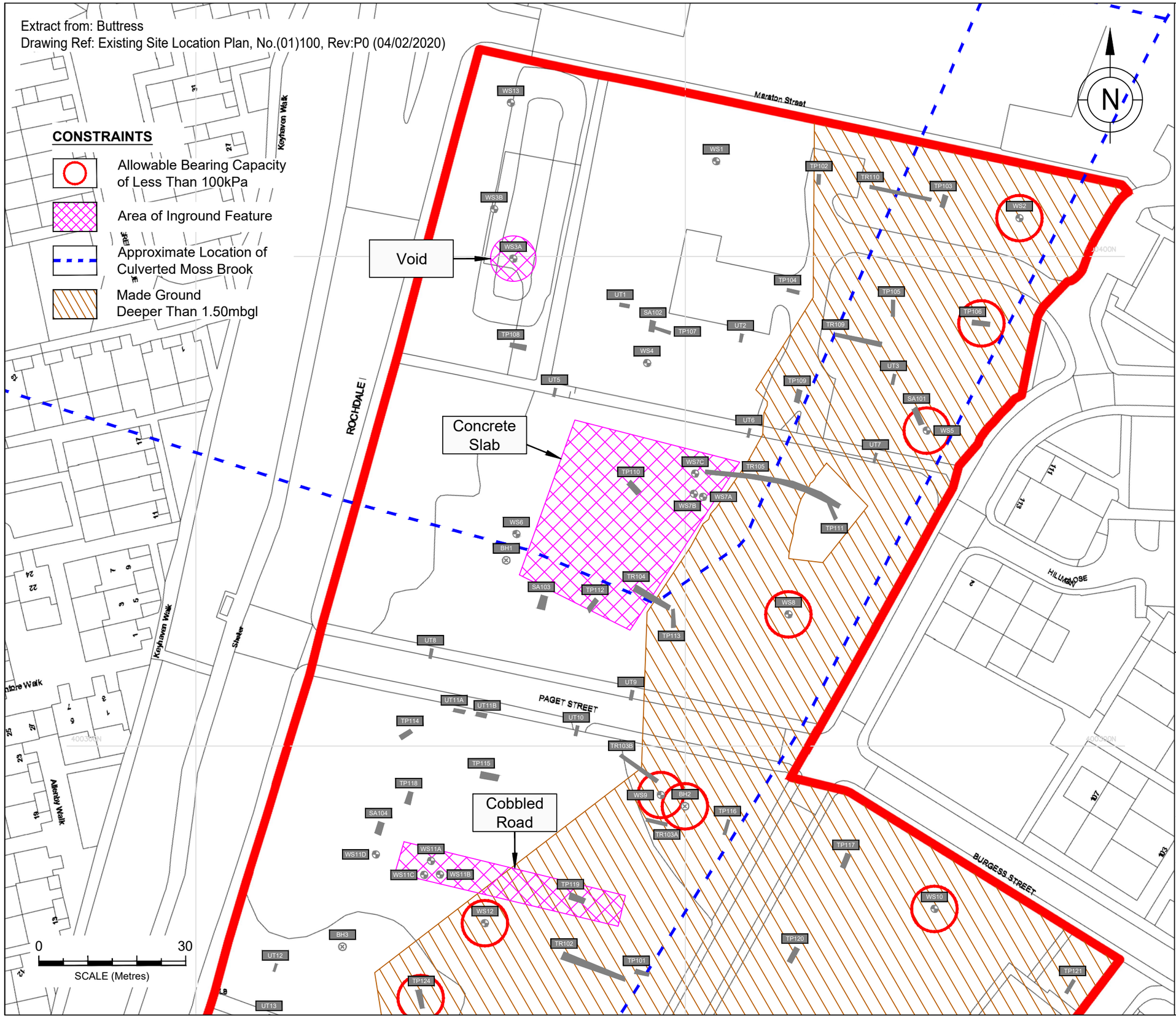
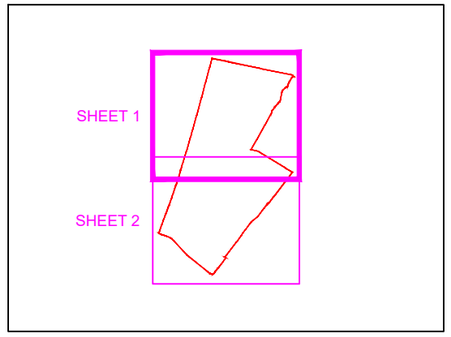
Client	Far East Consortium International Limited
Drawing Title	Topographical Survey of Land at: Collyhurst Survey Area 2 Manchester Sheet 3 of 3
Scale(s) 1:200	Surveyor JM
Date Mar 20	Drawn OKS
Job Number 20C045	Checked TP
Sheet Size & Drg Number & Revision	A0 20C045/003



KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)



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LK CONSULT LIMITED

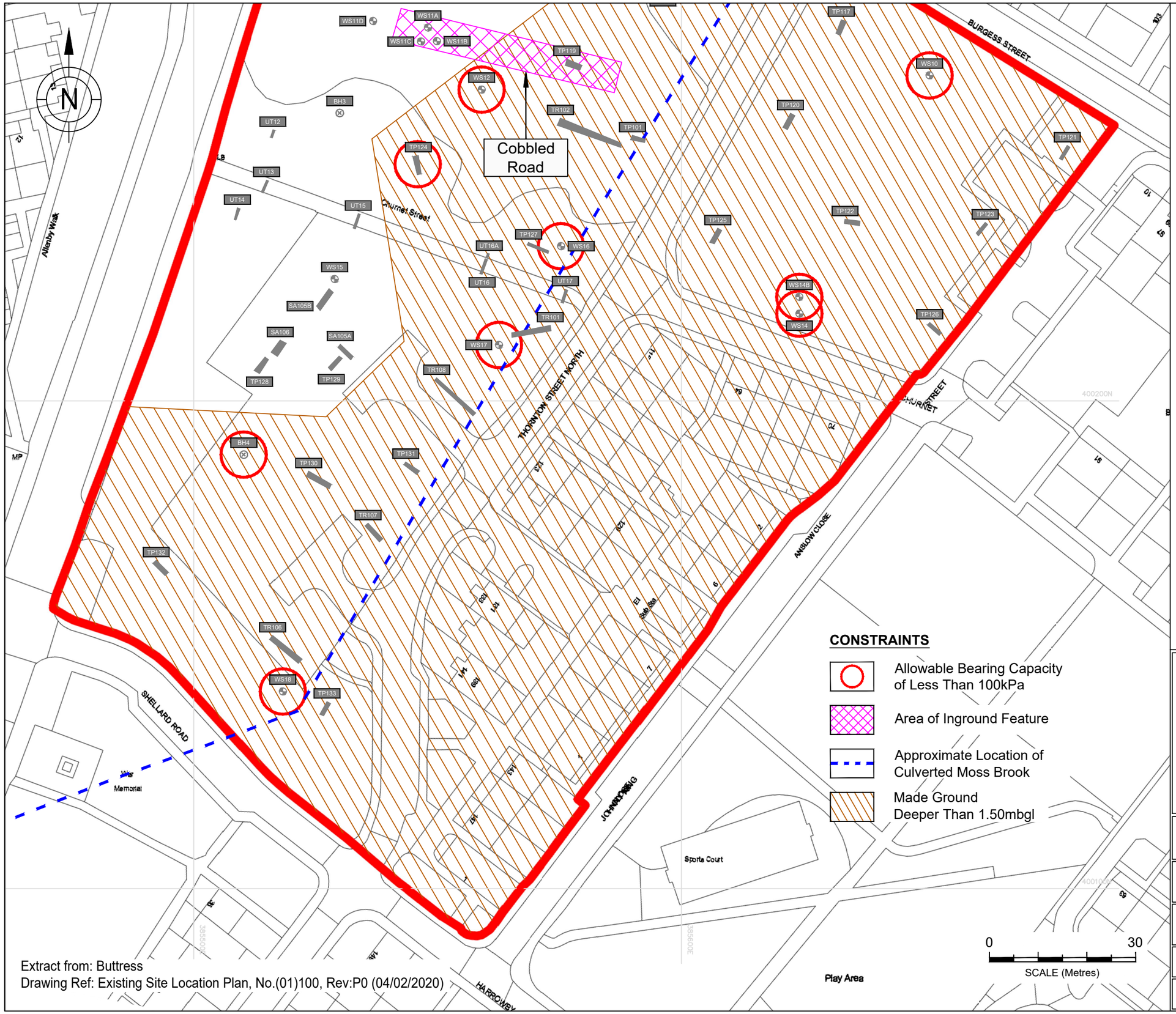
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Geotechnical Constraints Plan, Current Mapping (Sheet 1)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar		

Drawn By:	Checked By:	Drawn:
AC	PW	Aug 2020



KEY

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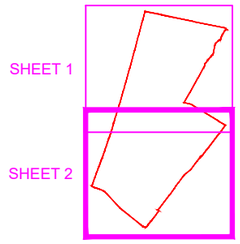

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CONSTRAINTS

- Allowable Bearing Capacity of Less Than 100kPa
- Area of Inground Feature
- Approximate Location of Culverted Moss Brook
- Made Ground Deeper Than 1.50mbgl

0 30

SCALE (Metres)

Extract from: Buttress
Drawing Ref: Existing Site Location Plan, No.(01)100, Rev:P0 (04/02/2020)

LK CONSULT LIMITED

Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Geotechnical Constraints Plan, Current Mapping (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar		

Drawn By:	Checked By:	Drawn:
AC	PW	Aug 2020

Extract from: Ordnance Survey
Drawing Ref: 1st Edition Geological Mapping, Sheet 104 (1848)

CONSTRAINTS

- Allowable Bearing Capacity of Less Than 100kPa
- Area of Inground Feature
- Approximate Location of Culverted Moss Brook
- Made Ground Deeper Than 1.50mbgl

Void

Concrete Slab

Cobbled Road

WS13 WS1 WS3B WS3A WS2 TP102 TR110 TP103 TP104 TP105 TP106 TR109 UT1 SA102 TP107 UT2 TP108 WS4 UT3 UT5 TP109 SA101 WS5 UT6 UT7 WS7C TP110 TR105 WS7A WS7B WS6 BH1 TP111 TR104 SA103 TP112 WS8 TP113 UT8 UT9 UT11A UT11B TP114 UT10 TR103B TP115 TP118 WS9 BH2 TP116 SA104 TR103A TP117 WS11D WS11A WS11C WS11B TP119 WS10 WS12 BH3 TR102 TP120 UT12 TP101 TP121 TP124 UT13

0 30
SCALE (Metres)

N

KEY

- Site Boundary
- Cable Percussive Borehole (BH)
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- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)

SHEET 1
SHEET 2

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

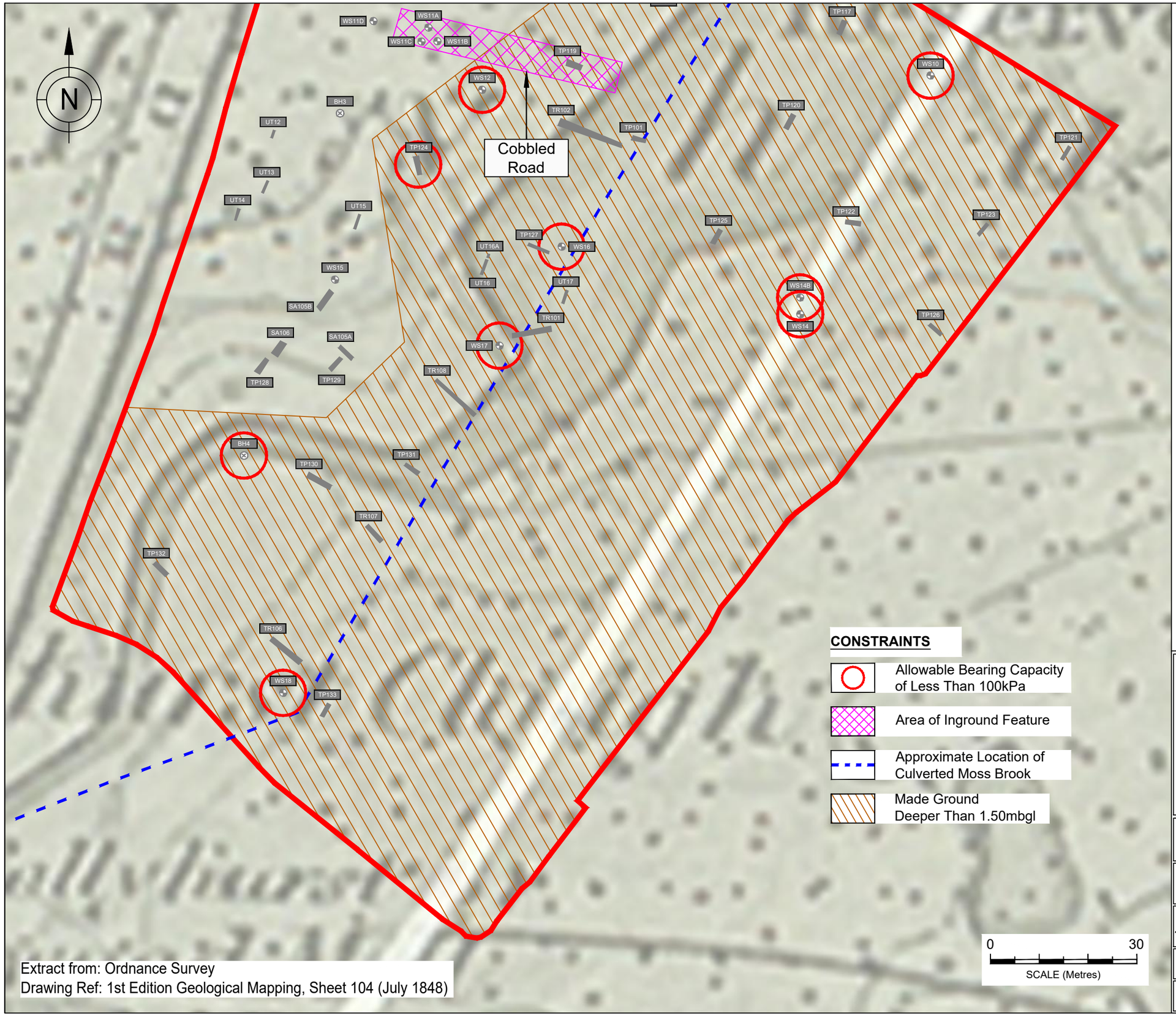
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Geotechnical Constraints Plan, 1st Edition Geological Mapping (Sheet 1)

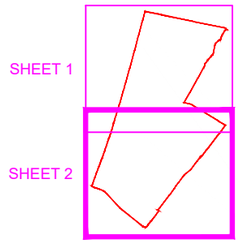
Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar		

Drawn By:	Checked By:	Drawn:
AC	PW	Aug 2020



KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)



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CONSTRAINTS

- Allowable Bearing Capacity of Less Than 100kPa
- Area of Inground Feature
- Approximate Location of Culverted Moss Brook
- Made Ground Deeper Than 1.50mbgl

0 30
SCALE (Metres)

Extract from: Ordnance Survey
Drawing Ref: 1st Edition Geological Mapping, Sheet 104 (July 1848)

LK CONSULT LIMITED

Client: Civic Engineers

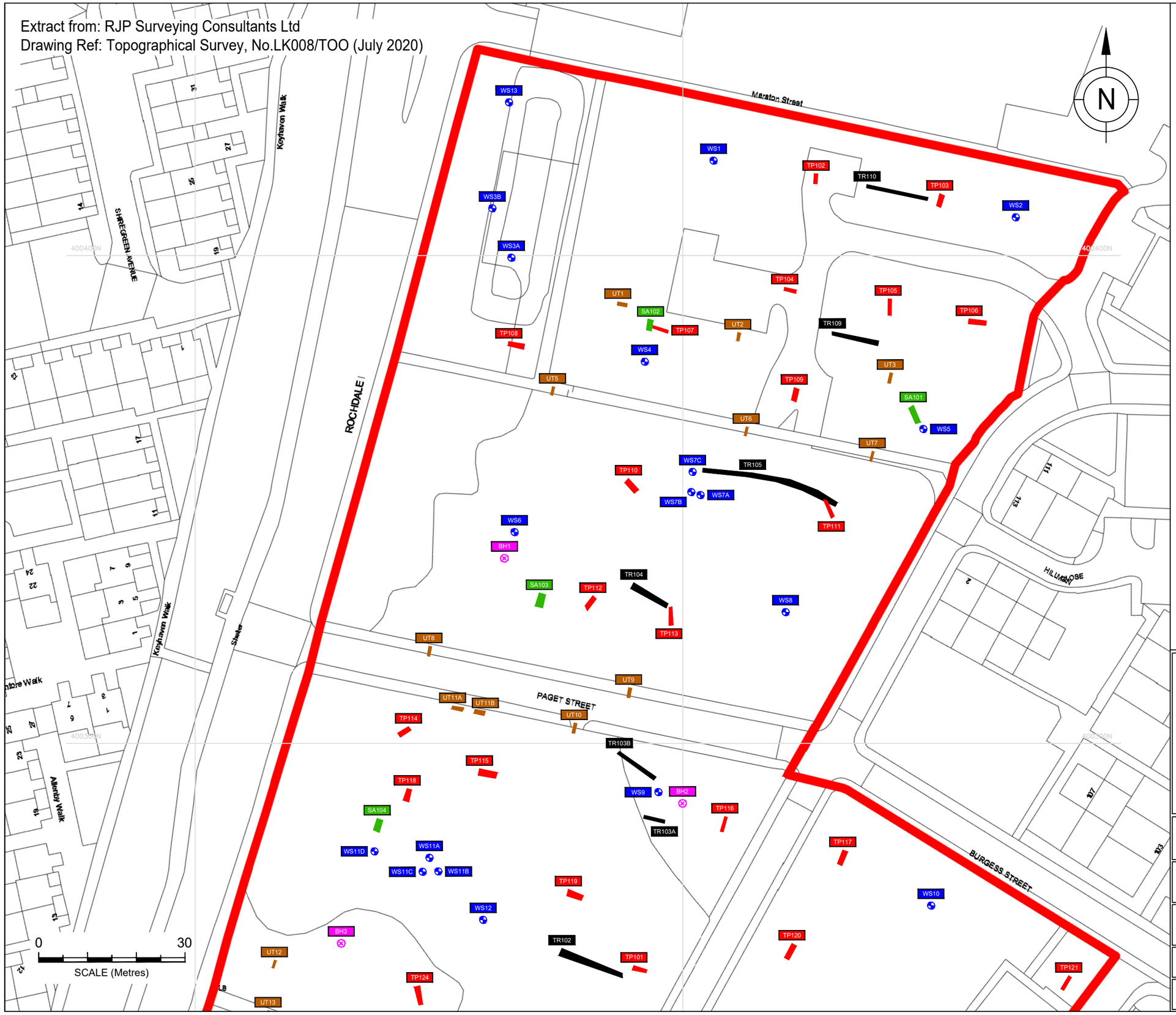
Site: Collyhurst Village, Manchester

Title: Geotechnical Constraints Plan, 1st Edition Geological Mapping (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar		

Drawn By:	Checked By:	Drawn:
AC	PW	Aug 2020

Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)



KEY

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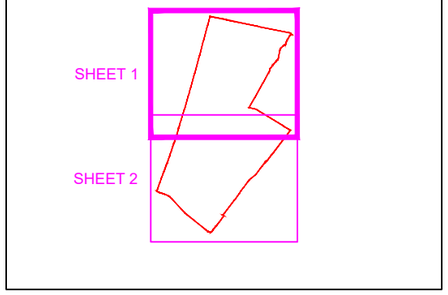

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LK CONSULT LIMITED

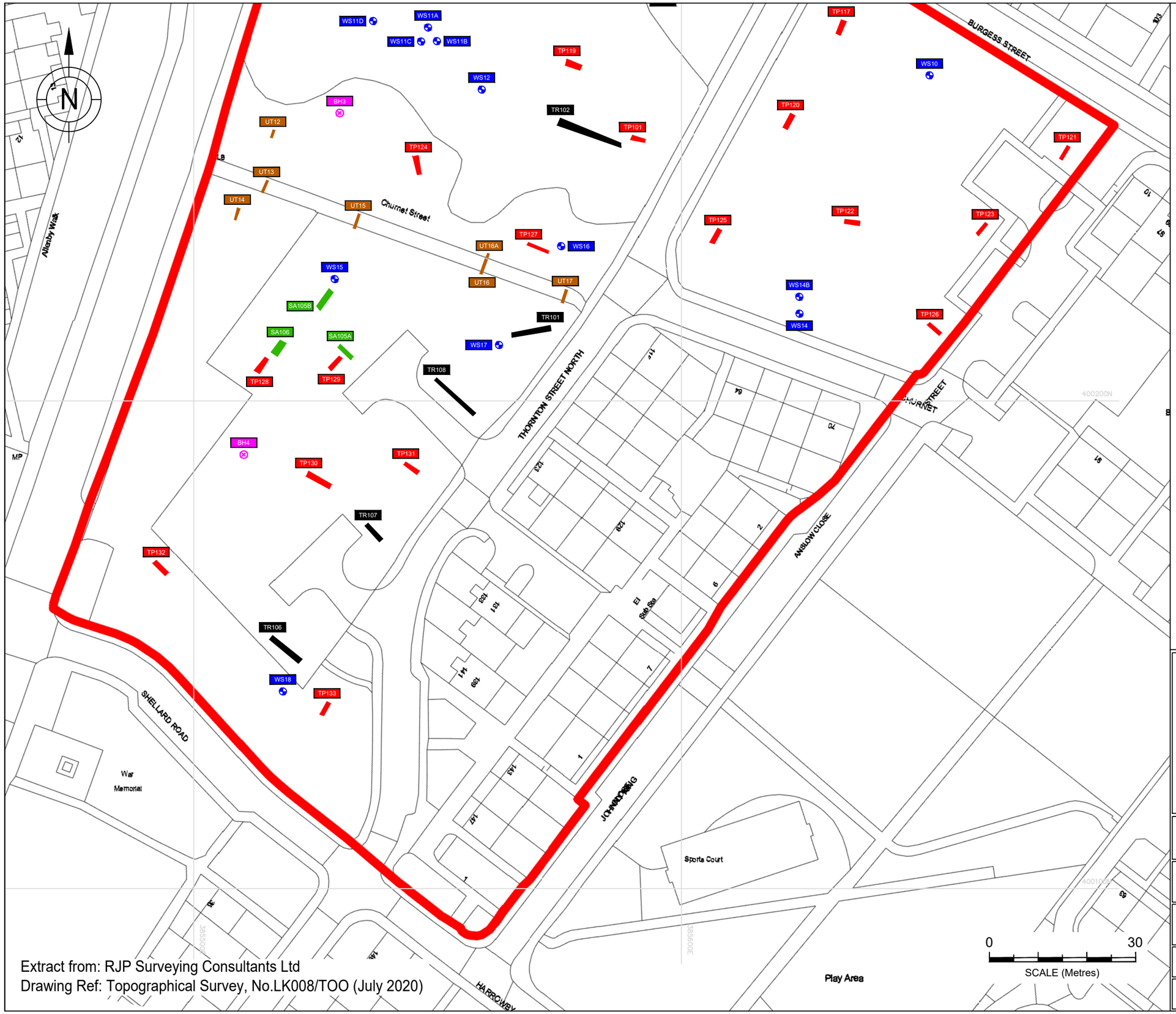
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Site Investigation Location Plan (Sheet 1)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	4	

Drawn By:	Checked By:	Drawn:
AC	HM	Aug 2020



Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)

KEY

- Site Boundary
- Cable Percussive Borehole (BH)
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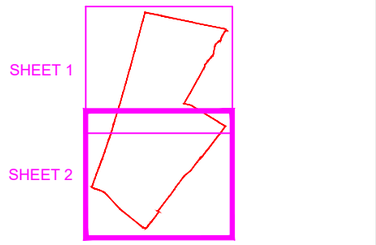

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LK CONSULT LIMITED

Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Site Investigation Location Plan (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	4	

Drawn By:	Checked By:	Drawn:
AC	HM	Aug 2020

COLLYHURST VILLAGE
MANCHESTER

PHASE 2
ENVIRONMENTAL INVESTIGATION, RISK ASSESSMENT AND REMEDIATION STRATEGY

Job Number: LKC 20 1120
Date: October 2020
Client: Far East Consortium International

INCREASING LAND VALUE

LK GROUP

LK Consult Document Verification			
Site Address	Collyhurst Village, off Thornton Street North, Manchester, M40 7SU		
Report Title	Phase 2 Environmental Investigation, Risk Assessment and Remediation Strategy		
Job Number	LKC 20 1120	**Document Ref.**	CL-602-LKC 20 1120-02
Date Issued	October 2020	**Report Version**	R0
Prepared By	Hannah Moss	**Signature**	
Prepared By	Chris Hughes	**Signature**	
Reviewed By	Dr Paul Quimby	**Signature**	

Revision Record			
Revision No.	**Date**	**Nature of Revision**	**Approved By**

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EXECUTIVE SUMMARY

Site Details

Site Location:	East of Rochdale Road in the Collyhurst area of Manchester. Centred at approximate National Grid Reference 385570E 400290N.
Site Area:	4.26Ha
Current Land Use:	Plot D - Far North Currently fenced off area accessed off Needwood Close. Tarmac roads still present but all buildings have been demolished. Plot C - North This parcel of land is vegetated with mature trees along the boundary with Rochdale Road in the west and several mature trees across the eastern half of this Plot. There is a noticeable area in the centre of this Plot which is mainly grassed and has no large trees. This Plot is separated from Plot D to the north by a footpath. Plot B - Centre Heavily vegetated area separated from Plot C to the north by Paget Street and from the Plot A to the south of the site by a footpath. Plot A - South Currently fenced off area accessed off Thornton Street North. Tarmac roads still present but all buildings have been demolished. Public Open Space Area to the east of Thornton Street North currently maintained grassland. SE Corner Currently occupied by residential properties.
Proposed Development:	Residential end use including townhouses and duplex apartments.
Purpose of Report:	Contamination Assessment.

Preliminary Risk Assessment

PRA Details:	Undertaken by LKC in August 2020. Ref: LKC 20 1120.
History:	Reservoir in E between 1848-1850. Watercourse between 1848-1850. Residential streets and dwellings between 1891-2006. Orchard between 1893-1894 mapping. Various non-residential buildings between 1949-2006. Mound between 1989-2006. Surrounding area – several potentially infilled features. Commercial / industrial properties.
Geology / Hydrogeology:	Glacial Till (Secondary Undifferentiated Aquifer) over Pennine Middle Coal Measures, Pennine Lower Coal Measures and Worsley Delf Rock (Secondary A Aquifer).
Mining:	Southern perimeter of site within DHRA relating to 'Probable Shallow Coal Mine Workings'.
Relevant Environmental Setting:	Culverted Moston Brook onsite. No pollution incidents recorded on site, nearest 141m NE (Category 3, 1996). Nearest surface abstraction 303m NW (license revoked). Nearest groundwater abstraction 474m W. Not within Source Protection Zone.
Preliminary Conceptual Model: PL=Pollutant Linkage	PL1 Direct Contact (Human Health): Moderate Risk (asbestos, metals, PAHs, PCBs), Moderate / **Low** Risk (hydrocarbons, organic / inorganic contaminants), Low Risk (Pesticides, detergents). PL2 Inhalation of Vapours: Moderate / **Low** Risk (volatile contaminants). PL3 Gas: Moderate Risk (hazardous gas), **Moderate** / Low (Ground Gas) PL4 Controlled waters: **Moderate** / Low Risk (mobile contaminants). PL5 Sulphate Attack: **Moderate** / Low Risk (sulphate). PL6 Water Pipelines: **Moderate** / Low Risk (organic contaminants). PL7 Phytotoxic: Low Risk (metals).
Recommendations:	Site Investigation was recommended to further assess all the above pollutant linkages.

Ground Investigation Work Undertaken

Date of Investigation:	13th to 23rd July 2020
Intrusive Investigation Work Undertaken:	10no. window sample boreholes (WS101-WS106). 33no. mechanically excavated trial pits (TP101-TP107). 10no. mechanically excavated trial trenches (TR101-TR110). 18no. Utility Trenches using Vacuum Excavator (UT1-UT18). 6no. Soakaway Tests (SA101-SA106). 4no. Cable Percussion boreholes (BH1-BH4). 5no. Dynamic Cone Penetration Tests (DCPSA1-DCPSA5). 4no. Rotary boreholes (RBH1-RBH4).
Monitoring Wells:	Installed in WS1-WS6, WS8-WS18, BH1-BH4.
Soil Sampling:	39no. samples tested for metals, speciated PAHs, pH, sulphate, asbestos and SOM. 15no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, VOCs, SVOCs, PCBs and SOM. 1no. samples tested for TPHCWG, BTEX, MTBE and SOM. 2no. samples tested for asbestos identification. 9no. samples tested for Waste Acceptance Criteria.
Groundwater Sampling:	6no groundwater samples tested for metals, speciated PAHs, cyanide, pH, sulphate, hardness, phenol, TPHCWG, BTEX. 3no. soil leaching tests for TPHCWG, BTEX, MTBE and hardness
Monitoring:	6no. gas monitoring visits over 3 months.
Insitu and Laboratory Geotechnical Testing:	In-situ testing (SPTs, hand shear vanes, pocket penetrometers DCPs, Soakaway tests). Laboratory Testing: Soil (Moisture Content, Particle Size Distributions, Liquid and Plastic Limits, Determination of Density, Oedometer, Single Stage Undrained Triaxial), Rock (Unconfined Compressive Strength and Point Loads).

Contamination Risk Assessment

The table below shows a summary of the risk assessments undertaken for each pollutant linkage, the revised conceptual model and recommendation for either remediation and / or further investigation.

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to site users future residents, site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and vegetables).	**Moderate** **Residential with private gardens**	– Moderate risk as elevated metals (arsenic and lead) and PAHs identified in the made ground which could come into contact with site users in gardens / soft landscaping areas. – **Recommendation:** Remediation required to include an environmental cover system in gardens where residential houses are present.
		Moderate / **Low** **Residential with private gardens**	– Low risk as limited heavy end hydrocarbons encountered and related to discrete cobble with bitumen coating and not representative of made ground matric. – ACM identified at Limits of Detection (LOD) as chrysotile in one location within landscaped areas. Visible pieces of ACM identified in a small number of locations. -Low risk assumed. – **Recommendation:** Removal of the mound. Hand picking of visible ACM pieces. Environmental cover system as above for metals and PAHs will be sufficient in residential gardens.
1	Contaminants posing a risk to site users future residents, site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and vegetables).	**Low** **Apartment Block, small verges (no gardens) and POS**	– Low risk as No elevations identified within proposed apartment block areas. – Localised elevations in POS area unlikely to pose a risk based on limited end use anticipated and nature of ground conditions. – **Recommendation:** Nominal 150mm topsoil layer in shared soft landscaping within apartment blocks and small verges. No specific remediation required in the POS area.
		Moderate **SE occupied site**	– Moderate risk for heavy metals, PAHs and localised PCBs. Risk cannot be confirmed at this stage until investigation has taken place in southeast of site currently covered by occupied houses. – **Recommendation**: Intrusive investigation required once area has been demolished.
2	Volatile contaminants posing a risk to site users future site users via the inhalation of vapours.	**Low**	– No significantly elevated volatile contamination identified. **Recommendations:** No remediation required.
3	Gas posing a risk to buildings and site users buildings and site users via the migration of gas into building causing explosion and asphyxiation.	**Moderate** **East of Plot B**	– Elevated carbon dioxide identified (max. 16%v/v) in area of former infilled reservoir, but at negligible flow rates. Sufficient evidence to uprate the east of Plot B to CS2 from CS1. – **Recommendation:** Gas protection measures in line with CS2 required in the east of Plot B (see Figure 6). No gas protection measures in remainder of site.
		Moderate / **Low** **Remainder of occupied site**	– Remainder of site is within CS1 scenario and no evidence (e.g significant elevated gas concentrations or flow rates) to uprate the rest of the site to CS2. – Low risk assumed based on gas concentrations and flow rates being low to very low across most of the site. – **Recommendation:** No gas protection measures required
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	**Low**	– Only elevated manganese recorded in groundwater samples when compared to relevant assessment criteria. – Very localised leachable hydrocarbon fractions relating to tarmacadam fragments in made ground. Not considered to pose a significant risk to wider groundwater. – **Recommendation**: No remediation required.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	-Assessed in geotechnical report. Elevated sulphate sporadic across the site. **-Recommendation**: Worst case sulphate resistant concrete to DC-2 AC-1s required.	
6	Organic contaminants posing a risk to water pipes.	**Moderate**	– Organic contamination identified at potable pipe depth of 0.75-1.35mbgl. – **Recommendations:** UU risk assessment to be completed. The site will likely require barrier piping.
7	Phytotoxic metals posing a risk to flora via root uptake.	**Very Low**	– Elevated contaminants identified, but no vegetative stress. – **Recommendations:** No specific remediation required, but nominal clean cover will be sufficient.

Recommendations and Remedial Strategy

The table below shows the remediation and validation requirements for the site. This information should be documented in a Site Completion Report for submission to the local authority.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	All	Post-demolition Trial Pitting in SE This is recommended to confirm ground conditions below the current buildings and allow delineation of areas of concern. This should allow a more targeted remediation strategy to be completed. This work will also provide more geotechnical information for foundation design.	N/A (Investigation Report will be provided with an updated Remediation Strategy).
		The bunded material will need further testing before disposal in relation to LOD ACM identified in one sample (assumed disposal as site is to be reduced in levels). Appropriate asbestos management will be required by the Remediation Contractor before work commences.	Report results and provide disposal tickets as part of wider earthwork removal offsite.
	ALL	Earthworks Inspections / Unexpected Contamination The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required. Material should be stockpiled and quarantined on visqueen and covered.	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
On / Post-Construction	3	Gas Protection Measures required in Localised Areas (East of Plot B – see Figure 6) In line with CS2 as per UK guidance[1,2]. This is likely to / should include: • Passive subfloor or active subfloor ventilation system. • Methane and carbon dioxide resistant membrane installed as per manufacturer's instructions. • Ventilation of confined spaces within the building. • Well-constructed reinforced suspended, raft or cast in situ ground slab. • Minimum penetration of ground slab by services. • All joints and penetrations to be sealed. Depending on the type of building and foundation design the protection measures can vary. The gas protection measures will be detailed and approved with the Local Authority once the foundation design has been confirmed.	Supply and review of foundation designs. Photographic evidence of sub-floor void, ventilation and suitably sealed gas membrane. Validation of gas protection measures should be in line with CIRIA 735[3]

[1] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665
[2] BSI (2015). "Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for new buildings." BS8485:2015.
[3] CIRIA (2014). "Good Practice on the Testing and Verification of Protection Systems for Building Against Hazardous Ground Gas". CIRIA C735.

Phase	PL	Remediation Requirements	Validation Requirements
On / Post--Construction	1 and 7	Environmental Cover System (Residential with garden areas only- see Figure 6) As made ground is relatively deep, it is unlikely to be viable to remove the contaminated soils. Therefore, an environmental cover system is recommended. The environmental cover system should be as follows: **Private Back Gardens:** **600mm thick environmental cover system comprising:** **Either** 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 500mm comprising clean inert fill and sufficient topsoil for a growing medium. **Or** geotextile membrane and at least 600mm comprising clean inert fill and sufficient topsoil for a growing medium. **Private Front Gardens:** **450mm thick environmental cover system comprising:** **Either** 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 350mm comprising clean inert fill and sufficient topsoil for a growing medium. **Or** geotextile membrane and at least 300mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. **Landscaping Around Apartment Blocks, small verges around duplex buildings and POS.** Topsoil Growing Medium Although no contamination were at levels or in a matrix that could significantly harm key receptors in areas of landscaping around the apartment blocks, POS and small verges around the duplex buildings, the existing made ground is not expected to be a suitable growing medium given the nature of the soil and the undesirable material present (ash and brick). A minimal topsoil cover of approximately 150mm is recommended	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 8-2.
	5	Sulphate Resistant Concrete Sulphate Resistant Concrete in line with DS-2 AC-1s may be required in localised areas.	N/A
	6	Potable Water Pipes It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material or Photographs of the Installed Pipe.

Chemical validation of all imported soils to be used on site in gardens and soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

The remediation recommended in the table above should be validated to ensure it has been carried out appropriately. This should be documented in a Completion/Validation Report and submitted to the local authority for completion.

Other Considerations
Grubbing Out of In-Ground Structures It is recommended that in-ground structures are grubbed out as part of the groundworks
Re-use of site won material (LKC understand site levels will be reduced so may not be required) To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used): 5,000 tonnes (*c.* 2,500m^3) treatment of crushed concrete / stone. 1,000 tonnes (*c.* 500^3) use of non-hazardous soil 5,000 tonnes (*c.* 2,500m^3) use of clays, sand, gravel, brick, concrete, stone etc. 50,000 tonnes (*c.* 25,000m^3) use of bitumous material to be used in roadways. A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered **before** material movement starts onsite. If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'. For all the above material will need to be tested at the rate and analytical suites presented in Table 8-3.
Asbestos Management Plan Due to the presence of asbestos containing material (1/54 in soil and 3no. visible pieces), it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations. This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, such as wetting techniques and it is recommended that an appropriate 'Asbestos Management Strategy' is developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733. This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring. With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012). If ACM is identified in soil arisings then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable (if present) and must be removed by a licenced contractor. Given that visible pieces of ACM were identified in TP104, TP18 and TP112, it is recommended that hand picking of the ACM is undertaken in these areas. The ACM should be doubled bagged and disposed of accordingly. The JIWG model (presented in Appendix J) identified this work to be classed as **Non-Licensed Work (basic RPE and localised dust suppression)** for the identified pieces of chrysotile cement and board. The soil ACM at LOD was considered a negligible risk, where CAR did not apply.
Health and Safety Considerations In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance[4]) should be adopted by all workers involved with site enabling and construction works.
Piling in Contaminated Land It is understood that the building will be piled. This may provide a preferential pathway for contaminants to the Secondary B Aquifer. Once the method of piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency.
Asbestos Survey (areas of occupied residential housing) A Pre-Demolition and Major Refurbishment Asbestos Survey should be undertaken, and any ACMs removed and properly disposed of, prior to the demolition of the existing buildings, by a suitably qualified professional.

[4] HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

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1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Civic Engineers Ltd to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for Collyhurst Village. The investigation was undertaken in support of a future planning application to develop the site for residential use.

With regards to contamination, the following work has previously been undertaken:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 20 1120B, dated 4th February 2020).
- Updated Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 20 1120, dated August 2020). To incorporate the extended planning boundary.

This investigation has been undertaken to confirm the ground conditions below the site and to allow a contamination and geotechnical assessment to be undertaken.

The geotechnical assessment and desk based Coal Mining Risk Assessment (CMRA) will be reported under separate cover and will not be discussed in this report.

The investigation will aim to confirm the risks of the potential pollutant linkages identified in the PRA and recommend further assessment / remediation, as required.

The aims of this report are also to establish the feasibility of developing this site, to demonstrate to the Local Planning Authority that in accordance with the National Planning Policy Framework (NPPF)[5] the site may be developed for a residential end use and that appropriate site investigation and risk assessment works are in place to allow conditional approval of any future planning application.

[5] DCL (2019). "National Planning Policy Framework." Department of Communities and Local Government.

1.2 Site Details

A summary of the site details is presented in Table 1-1. Figures 1 and 2 indicate the site location and boundary. Figure 3 indicates the proposed development.

Location	East of Rochdale Road in the Collyhurst area of Manchester. Centred at approximate National Grid Reference 385570E 400290N.
Area	4.26Ha
Topography	60 metres Above Ordnance Datum (AOD). Site is approximately level.
Land Use	Plot D - Far North Currently fenced off area accessed off Needwood Close. Tarmac roads still present but all buildings have been demolished. Plot C - North This parcel of land is vegetated with mature trees along the boundary with Rochdale Road in the west and several mature trees across the eastern half of this Plot. There is a noticeable area in the centre of this Plot which is mainly grassed and has no large trees. This Plot is separated from Plot D to the north by a footpath. Plot B - Centre Heavily vegetated area separated from Plot C to the north by Paget Street and from the Plot A to the south of the site by a footpath. Plot A - South Currently fenced off area accessed off Thornton Street North. Tarmac roads still present but all buildings have been demolished. Public Open Space Area to the east of Thornton Street North currently maintained grassland. SE Corner Currently occupied by residential properties.
Proposed Development	Residential end use including townhouses and duplex apartments.

Table 1-1 : Summary of site details.

2 Previous Work

2.1 Summary of Existing Information

An updated PRA report (Ref: LK 20 1120, dated August 2020) has previously been undertaken by LKC, given the site boundary had changed since completing the original PRA (Ref: LKC 20 1120B, dated 4th February 2020). The updated report is summarised in Section 2.2-2.6.

2.2 Site History

The site history is summarised in Table 2-1.

Site Features	Location	Map Dates Present	Comments
Watercourse	N and S	1848-1850	- Present on NE perimeter and S part of site. - Annotated as Moss Brook on 1850 mapping. - No longer present by 1891 mapping. Culvert Street named on site would indicate watercourse culverted.
Reservoir	E	1848-1850	- Partially located on site. - No longer present by 1891 mapping.
Residential streets and dwellings	Majority of site	1891-1966	- Hall's Crescent, Oswald's Grove, Churnet Street, Paget Street, Stretton Street, Fildes Street, Alexandria Street, Needwood Street, Knightley Street, Culvert Street, Anslow Street, North Kent Street and Groome Street present on site. - Some clearance of buildings on site by the 1938 mapping. - North Kent Street, Groome Street and Anslow Street no longer present by 1938 mapping. - Burgin Street added to southern part of the site by the 1949 mapping. - An electricity sub station is present on the southern part of the site by the 1949 mapping. - Re-development of houses on the northern part of the site by the 1949 mapping. Erith Walk added to the NE part of the site. - Burgin Street no longer present by 1983 mapping replaced with Thornton Street North and associated new residential dwellings. - New buildings constructed on the eastern part of the site by 1986 mapping (residential dwellings and possible apartment building). - Majority of buildings no longer present by the 1975 mapping. Residential dwellings on the southern part of the site and SE perimeter remain.
Club	NW	1891-1966	- No longer present by the 1975 mapping.
Public open space	S	1891-1938	- No longer present by 1949 mapping.
Orchard	S	1893-1894	- No longer present by 1908 mapping.
Day nursery	Central	1949-1999	- Annotated as 'community centre' by the 1977 mapping. - Annotated as 'Law centre' by the 1986 mapping. - No longer present by 2000 Aerial photography.

Table 2-1: Summary of significant historical features.

Site Features	Location	Map Dates Present	- Comments
Public House	W	1949-1966	- No longer present by 1975 mapping.
Cinema	S	1949-1982	- No longer present by the 1992 mapping.
Cutting	S	1949-1977	- No longer present by 1982 mapping.
Surgery	NW	1962-1966	- No longer present by 1975 mapping.
Overbrook Avenue and associated residential dwellings	S	1962-2006	- No longer present by the 2019 mapping.
White Gate (Home for the Aged)	N	1975-2006	- No longer present by the 2019 mapping.
Welfare centre	E	1977-2006	- No longer annotated by the 1986 mapping. - No longer present by the 2019 mapping.
Needwood Close and associated residential dwellings	N	1986-2006	- No longer present by the 2019 mapping.
Mound	NW	1989-2006	- No longer present by the 2019 mapping.
Surrounding Area Features	**Distance / Location**	**Map Dates Present**	**Comments**
Reservoir	Adj. NE	1848-1850	- No longer present by 1891 mapping.
Pond	60m SE	1848-1850	- No longer present by 1891 mapping.
Pond	110m SE	1848-1850	- No longer present by 1891 mapping.
Mill	100m SW	1848-1975	- No longer present by 1977 mapping.
Quarry	150m W	1848-present	- Annotated as playing field by 1966 mapping.
Pond	150m E	1848-1850	- No longer present by 1891 mapping.
Brick field	Adj. S	1850 only	- No longer present by 1891 mapping.
Burial ground	70m E	1891-1938	- No longer present by 1949 mapping.
Oilcloth manufactory	10m E	1891-1966	- Annotated as mineral water manufactory by 1908 mapping. - Annotated as 'Dixie Mills (cotton waste)' by the 1949 mapping. - Split into two works and a warehouse by the 1962 mapping. - No longer present by 1975 mapping.
Oilcloth manufactory	10m SE	1891-1966	- Annotated as tin stamping works by 1908 mapping. - No longer present by 1975 mapping.
Timber yard	20m SE	1891-1938	- Annotated as 'Climax works (window blind furniture)' by 1908 mapping. - No longer present by the 1949 mapping.
Tramway	Adj. W	1891-1932	- No longer present by 1938 mapping.
Railway tunnel	60m N	1891-present	
Cutting	120m NW	1891-1894	- No longer present by 1908 mapping.
Warehouse	50m SW	1949-1978	- No longer present by the 1977 mapping.
Works	30m W	1962-1966	- No longer present by 1975 mapping.
Warehouse	45m N	1962-1966	- No longer present by 1975 mapping.
Scrap metal yard	45m N	1977-1986	- Annotated as depot from 1983 mapping. - No longer annotated by the 1989 mapping.

Table 2-1(continued): Summary of significant historical features.

2.3 Environmental Setting

The environmental setting is summarised in Table 2-2.

Categories			Details
Geology	Artificial		- None recorded on site on the database. - Worked ground (void) is located approximately 50m SSW.
	Superficial		- Till.
	Bedrock		- Northern and central part of the site: Pennine Middle Coal Measures (mudstone, siltstone and sandstone). - South of central part of the site: Pennine Upper Coal Measures (mudstone, siltstone and sandstone). - Southern part of the site to southern site boundary: Worsley Delf Rock (sandstone).
	BGS Logs		- BH Ref: SD80SE44, 49m NW: made ground to 0.15m, stiff clay to 5.33m, sand to 5.94m, clay with boulders to 10.13m, mudstone to 13.41m, shale to 15.01m, coal to 15.31m, coal shale to 15.62m, fireclay to 16.6m, mudstone to 20.2m, shale to 22.25m, mudstone to 22.7m, shale to >26.36m. - BH Ref: SD80SE43, 53m NW: made ground to 0.46m, clay to 14.63m, shale to 16.3m, fireclay to 17.22m, rock to >26.36m.
Hydro-geology	Aquifer Designation	- Superficial	- Secondary Aquifer - Undifferentiated.
		- Bedrock	- Secondary A Aquifer.
	Source Protection Zone (SPZ)		- Site is not within an SPZ.
	Groundwater Abstractions		- None within 250m. - Nearest 474m W held by Packaging Products Ltd for general cooling purposes.
Hydrology	Nearest Surface Water		- Culverted Moston Brook located on site. - River Irk 230m W, flowing SSW.
	Water Quality Data		- 15m N, Moston Brook – River Quality F.
	Flooding		- No risk from rivers or sea. - Potential for groundwater flooding of property situated below ground level and potential for groundwater flooding to occur at surface identified.
	Surface Water Abstractions		- None within 250m. - Nearest 303m NW for abstraction from the River Irk for Manufacturing. The licence has been revoked.
	Discharge Consents		- 23 within 250m: nearest located on site held by United Utilities Water Ltd for final / treated sewage effluent discharge to Moston Brook. The authorisation was revoked in 1993.
	Pollution Incidents		- 2 within 250m: nearest 141m NE involving the release of crude sewage to Moston Brook from a private system due to a blocked sewer in 1996. The incident was classified as a Category 3 – Minor Incident.
Minerals & Mining	Coal Report[4]		- Site is located within reporting area.
	Coal Mining Development High Risk Area (DHRA)		- The southern perimeter of the site is located within a Development High Risk Area associated with 'probable past shallow coal workings'.
	Surface Extractions[1]		- 1 within 250m: located 218m SW for the opencast abstraction of sandstone. The site has ceased operation.
	Cheshire Brine Compensation District		- N/A.

Table 2-2: Summary of the environmental setting.

Categories		Details
Ground Stability (onsite)	Collapsible Ground	- Very low hazard.
	Compressible Ground	- No hazard.
	Ground Dissolution	- No hazard.
	Landslide	- Very low hazard.
	Running Sand	- Very low hazard.
	Shrinking / Swelling Clay	- Very low hazard.
Landfill Sites	Known / Registered	- 1 within 250m: - 52m SW historical landfill 'Land at Fitzgeorge Street'. No further details are given.
	Potential	- 11 within 250m: - Parts of a watercourse and reservoir on site, potentially infilled by 1891 mapping. - Cutting on S of site, potentially infilled by 1982 mapping. - Reservoir adjacent E, potentially infilled by 1891 mapping. - 3 ponds 120-170m, potentially infilled by 1891 mapping. - Quarry 150m W, potentially infilled by 1966 mapping. - Brickfield adjacent S, potential infilled by 1891 mapping. - Burial ground 70m E, no longer present by 1949 mapping. - Cutting 120m NW, potentially infilled by 1908 mapping.
Radon		- Probability of <1% of homes above Action Level. No further action required.
Designated Sites		- Site forms part of Nitrate Vulnerable Zone.
Contemporary Trade Directory		- 8 within 100m: Nearest onsite for carpet, curtain and upholstery cleaners. Listed as inactive.
Fuel Station Entries		- None within 100m.
Unexploded Bomb Risk (UXO)		- Moderate. - A Pre-Desk Study Assessment has been undertaken by Zetica which has concluded that, while prudent, a detailed desk study is not considered necessary.

Table 2-2: Summary of the environmental setting.

2.4 Site Reconnaissance

A site reconnaissance was carried out on 22nd January and 13th July 2020. Hand dug trial holes were undertaken in accessible areas to confirm the shallow ground conditions.

During the reconnaissance it was noted that the site has been split into sections and these are discussed as such below.

Northern Area

- The northern part of the site sits between two footpaths, the north named Marston Street.
- Access is from Thornton Street North via a double gate approximately 5m wide. An earth bund is present behind the gate to prevent vehicular access. The area is secure and enclosed by a fence but there is evidence of people breaking the fence and entering.
- The roadway and pavement of Needwood Close is still present on site. Lamp posts were still present along the roadway. The remaining ground conditions encountered comprise made ground (brick rubble, plastics, metals some ash and clinker and soil), vegetation and a flagstone path.
- There are two areas of block paving adjacent to the road in the centre.

- A hand auger in this area comprised sandy gravel with frequent brick fragments and whole bricks, metals, plastics, rare ash and clinker to >0.4mbgl.
- This area of the site was undulating, and a lot of the paving is cracked. There is also an area to the southeast that appears approximately 1.5m lower than the rest of the site.
- The mound on the western part of this site was observed to be approximately 2m high. The mound is vegetated and contains a number of trees which appear to be slipping.
- The footpath on the southern boundary contains manhole covers and fly-tipped domestic waste material.

North of Paget Street

- This area is open access via a gap in the fencing from the footpath between Thornton Street North and Rochdale Road.
- The site is predominately uneven grassland, with evidence of vehicles being driven across it.
- Fly tipping of domestic waste was also observed along the northern, eastern and southern borders.
- There is a small mound of dense vegetation within the southeast of the area.

South of Paget Street

- This area is open access, bound by Padget Street and another footpath on the south. Majority grassland, there are also some mature and young trees that show signs of slipping, particularly near Thornton Road North and within the northeast area.
- The grass in the centre appears to have been cut recently.
- Fly tipping of domestic waste also observed along the east edge of the boundary.
- An area of the site within the trees in the eastern part of this area is being used for storing scrap metal.
- A public footpath is present to the south of this section, leading from Rochdale Road to Thornton Street North.
- Thornton Road North along the eastern boundary has manhole covers in the northeast and southeast corners.

Southern Area

- Similar to the northern area, the area is secure, and access is via a double gate from Thornton Road North. Earth bunds are present behind the gate to prevent vehicular access.
- Roadways and pavement for former Overbrook Avenue and Piccard Close are still present, with manhole covers, streetlights and services present on the pavements and roads.
- Hardstood ground is present across the majority of the site, comprising brick rubble, tarmac and brick paving.
- Four large manhole covers are present in the south of the site, 3 between the two roads and 1 to the southwest, all within the fenced area.
- Fly tipping is present along the eastern border and part of the southern border.
- The southernmost area of this site outside the fencing comprises kept grassland that looks to have been recently cut.
- The south east of the site comprises residential houses which are currently occupied with back alleys used for parking. Access for site investigation is currently restricted in this area.

- A series of large manhole covers are present along Thornton Street North and are also found in the entrance of Needwood Close, the end of Padget Street and the end of Churnet Street. These may be associated with the culverted brook

Eastern Area

- The eastern part of the site is currently vacant and comprises a grass covered section of land bound by small wooden posting.
- Two mature trees are noted in the north and south of the section.
- The northern part of the area is topographically higher than the southern part and gently slopes down from north to south.
- Evidence of former street lighting is present in the north of the area.

The surrounding area comprises:

- North: A footpath and fenced off section of land.
- East: Residential housing and Collyhurst Park.
- South: Shellard Road and residential housing.
- West: Rochdale Road and residential housing.

2.5 Contamination Sources / Pathways and Receptors

Potential contamination sources are detailed in Table 2-3.

Source	Contaminants
Onsite orchards	- Pesticides (including arsenic and lead used in historic pesticides). - Ash and clinker used for levelling / drainage: heavy metals, sulphates and PAHs[6]. - Localised area of the site, unlikely significant pesticides persistent in the soils given age and limited period of usage.
Onsite former buildings	- Asbestos Containing Material (ACM).
Onsite electricity sub station	- Polychlorinated biphenyl (PCBs) and transistor oils.
Onsite carpet, curtain and upholstery cleaners	- Detergents.
Onsite made ground (potentially infilled watercourse, reservoir and cutting, possible infilled basements, general made ground)	- Ash and clinker (e.g. from hearths and boilers, often historically used for site raising / levelling): Heavy metals, sulphates and PAHs. - Other unknown inorganic / organic contaminants (dependant on fill material source). - If significant depth of organic / putrescible material: Hazardous gas (principally carbon dioxide and methane).
Surrounding industries (oilcloth manufactory, timber yard, tramway, works, warehouse, scrap metal yard)	- Metals, inorganic compounds and organic compounds. - Not expected to be a significant source due to distance from site, age of site usage and intervening culverted brook.
Offsite historic landfill	- Identified 52m SW: hazardous gas (principally carbon dioxide and methane). The area of the landfill has remained undeveloped any gas present may vent directly to the atmosphere through the site surface, although the risk cannot be discounted at this stage.
Underlying Pennine Middle and Upper Coal Measures	- Ground Gas (principally carbon dioxide and methane). - Unlikely to be a significant source as worked or combustible seams not identified on site.

Table 2-3: Potential contamination sources

[6] Defra (2002). "Potential Contaminants for the Assessment of Land". R&D Publication CLR 8.

Potential receptors are detailed in Table 2-4.

Receptors	
Human Health	- Future site users (including residents, visitors and site workers). - Offsite land users.
Controlled Waters	- Moston Brook (culvert) on site. - Secondary A Aquifer.
Buildings and structures.	
Potable water pipes.	
Flora within future gardens and landscaping.	

Table 2-4: Potential receptors

Potential pathways are detailed in Table 2-5.

Pathways		
Soil	Human Health[7] (residential land use: houses with private gardens and residential apartments	- Ingestion of soil. - Ingestion of soil-derived indoor dust. - Ingestion of contaminated vegetables (gardens only). - Ingestion of soil attached to vegetables (gardens only). - Dermal contact with soil. - Dermal contact with soil-derived indoor dust. - Inhalation of soil-derived outdoor dust. - Inhalation of soil-derived indoor dust. - Inhalation of vapours outside. - Inhalation of vapours inside.
	- Windblown dust and fibres to adjacent receptors.	
	- Direct contact with receptors (building foundations, services).	
	- Root uptake.	
Water	- Surface run-off over impermeable surface.	
	- Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution).	
	- Migration through potentially permeable strata and preferential pathways. - Superficial (Till) likely to be low permeability. - Bedrock (mudstone, siltstone, sandstone) likely to variably permeable. - Bedrock (sandstone) likely to be relatively permeable. - Preferential pathways: culvert, services, worked coal seams.	
Gas	- Migration through potentially permeable strata and preferential pathways. - Superficial (Till) likely to be low permeability. - Bedrock (mudstone, siltstone, sandstone) likely to variably permeable. - Bedrock (sandstone) likely to be relatively permeable. - Preferential pathways: culvert, services, worked coal seams.	
	- Migration into buildings (e.g. via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).	

Table 2-5: Potential pathways.

2.6 LKC Preliminary Contamination Conceptual Model

The preliminary contamination conceptual model using contaminant-pathway-receptor linkages based on guidance in CLR11[8] has been summarised in Table 2-6.

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and determine what site investigation work is required.

[7] EA (2008). "Updated Technical Background to the CLEA Model". Science Report – SC050021/SR3.
[8] EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.

The preliminary contamination conceptual model has identified seven generic potential pollutant linkages. Each linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552[9].

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix A.

Where LKC identified a low to very low risk, limited intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what category the pollutant linkage will fall into (i.e. moderate or low risk will be chosen).

Where LKC identifies a moderate or higher risk, intrusive work or precautionary remedial measures will be recommended.

The conceptual model is based on the future use of the site (post development), in line with proposed development scheme.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers during development work. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors associated with the future use of the site. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance[10]) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

2.7 Recommendations

Based upon the Preliminary Contamination Conceptual Model a site investigation was recommended to assess the potential pollutant linkages further.

[9] CIRIA (2001). “Contaminated land risk assessment: A guide to good practice”. C552.
[10] HSE (1991). “Protection of Workers and the General Public During Development of Contaminated Land” London HMSO.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment & Recommendations
PL1	- Dermal contact. - Inhalation of soil, fibres and dust. - Ingestion of soils, dust, vegetables, soil attached to vegetables. - Windblown dust.	- Future site users. - Offsite receptors.	- ACM (former buildings, potentially in made ground). - Heavy metals and PAHs (made ground). - PCBs and transistor oils (electricity sub station)	Likely	Medium	**Moderate**	- Likely probability given history of site, date of demolition of former structures, identified ash made ground and potential pathway to receptors in gardens / landscaping. - **Recommendation**: Intrusive investigation required to include soil samples. Localised PCB testing (currently area occupied by housing).
			- Hydrocarbons, other inorganic and organic contaminants (made ground).	Low likelihood	Medium	Moderate / **Low**	- Low likelihood of hydrocarbons and other organic and inorganic contaminants associated with limited potential infilling identified on site and no specific source. Possible exception is the POS area where former reservoir located. - Low risk assumed at this stage (possible localised hotspots). - **Recommendation**: No testing required unless evidence of hydrocarbon contaminants identified in the ground.
			- Pesticides (orchard). - Detergents (cleaners)	Unlikely	Medium	**Low**	- Unlikely probability given limited extent and usage of site as orchard. In addition, the orchard was in use >100 years ago. Significant detergent contamination unlikely to persist within the soils. - **Recommendation**: No further assessment required.
PL2	- Inhalation of vapours. - Migration through permeable strata and preferential pathways.	- Future site users. - Offsite receptors.	- Volatile contaminants such as hydrocarbons, naphthalene (made ground).	Low likelihood	Medium	Moderate / **Low**	- Low probability as significant source of volatile contamination not identified historically but infilling of former reservoir has occurred. - Low risk assumed at this stage (possible localised hotspots). - **Recommendation**: No testing required unless evidence of volatile contaminants identified in the ground.
PL3	- Inhalation of gas. - Migration through permeable strata and preferential pathways. - Explosion in confined spaces.	- Future site users. - Buildings. - Offsite land users.	- Ground gas: - Methane, carbon dioxide (coal measures).	Unlikely	Severe	**Moderate** / Low	- Unlikely probability as potentially worked coal seams only identified on southern perimeter. - Moderate risk assumed at this stage. - **Recommendation**: Further assessment required once ground conditions are known.
			- Hazardous Gas: - Methane, carbon dioxide (landfill, potentially infilled features 250m of the site).	Low likelihood		**Moderate**	- Low probability given age and size of potentially infilled features identified on and offsite. Historic landfill has remained undeveloped; therefore, gas may vent to atmosphere. - **Recommendation:** Gas monitoring advised due to size of landfill and close proximity to the site.
PL4	- Surface run-off. - Migration through permeable strata and preferential pathways. - Perched waters migration.	- Groundwater (Secondary A Aquifer). - Surface water (Moston Brook, (culverted)).	- Mobile contaminants such as metals, PAHs, hydrocarbons, (made ground).	Low	Medium	**Moderate** / Low	- Low probability as significant source of mobile contamination not identified. Clay expected below the site will also prevent migration. - Moderate risk at this stage. - **Recommendation**: Precautionary testing required from selected boreholes.

Table 2-6: Preliminary Contamination Conceptual Model.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment & Recommendations
PL5	- Sulphate attack on concrete.	- Building structure.	- Sulphate (ash in made ground).	Likely	Mild	**Moderate** / Low	- Likely probability as ash was identified in made ground, which may be in contact with concrete used in future buildings. - Moderate risk assumed at this stage. - **Recommendation:** Intrusive investigation required as part of PL1.
PL6	- Ingestion of tainted water supply.	- Future site users. - Water pipes.	- Organic contaminants such as hydrocarbons (made ground).	Low	Medium	**Moderate** / Low	- Low probability as significant contamination not anticipated at pipeline depth (0.75-1.35m). - Risk is considered moderate at this stage due to unknown depth of made ground. - **Recommendation**: Sampling required if made ground present at pipeline installation depths.
PL7	- Direct contact (plant uptake).	- Flora.	- Phytotoxic contaminants (made ground).	Likely	Minor	**Low**	- Likely probability as contamination considered possible, which may be taken up by flora in soft landscaping / gardens. - **Recommendation**: Investigation work as part of PL1.

Table 2-6 (continued): Preliminary Contamination Conceptual Model.

3 Ground Investigation

3.1 Site Investigation Design and Methodology

In order to assess the ground conditions at the site and to investigate the potential pollutant linkages identified in the preliminary contamination conceptual model an intrusive investigation was undertaken.

The investigation was carried out on 13th to 23rd July 2020 and comprised the following:

- 18no. Window Sample boreholes drilled to max 5.45 metres below ground level (mbgl) (ref. WS101 to WS118) for contamination and geotechnical purposes.
- 33no. Trial Pits (using JCB 3CX) excavated to max 4.00mbgl (ref. TP101 to TP133) for contamination and geotechnical purposes.
- 10no. Trenches (using JCB 3CX) excavated to max 3.70mbgl (ref. TR101 to TR110) to ascertain edge of reservoir and find evidence of culvert.
- 18no. Utility Trenches (using Vacuum Excavator) excavated to 1.00mbgl (ref. UT1 to UT18.
- 6no. Soak Away tests (ref. SA101 to SA106).
- 4no. Cable Percussion boreholes drilled to 5.9-11.5mbgl (ref. BH1 to BH4) for geotechnical purposes.
- 5no. Dynamic Cone Penetration tests to 1mbgl (ref. DCPSA1 to DCPSA5) for geotechnical purposes.
- 4no. Rotary Bore Holes drilled to competent bedrock then cored to c. 20.00mbgl (ref: RBH1 to RBH4) for geotechnical purposes.

The area in the far southeast of the site is currently inaccessible for site investigation as the occupied houses in the area have not yet been demolished. Further site investigation will be required in this area post demolition.

Areas in the north of Plot C and southeast of Plot B were partially inaccessible due to dense vegetation (primarily trees).

All site investigation locations are shown in Figure 4.

With regards to the contamination assessment the following work was undertaken in each Plot (see Figure 3 for reference).

Plot A	Plot B	Plot C	Plot D	POS
BH4 WS15 WS17 WS18 TP128 TP129 TP130 TP131 TP132 TP133	BH2 BH3 WS9 WS11 WS12 WS16 TP101 TP114 TP115 TP116 TP118 TP119 TP124 TP127	BH1 WS6 WS7 WS8 TP110 TP111 TP112 TP113	WS1 WS2 WS3 WS4 WS5 WS13 TP102 TP103 TP104 TP105 TP106 TP107 TP108 TP109	WS10 WS14 TP117 TP120 TP121 TP122 TP123 TP125 TP126

Table 3-1: Locations within each plot.

The locations were chosen to allow a good spread across the site as well as target areas of concern. Table 3-2 details the targeted and general coverage (non-targeted) site investigation locations.

Site Investigation Locations	Rationale
WS1-WS6, WS11D, WS12, WS15, WS18 TP102-107, TP129-TP133	General site coverage and area of former residential terraces.
WS13, WS3-3B, TP108	Close to, or within, mound on site.
BH1, BH4, BH3, RBH1, RBH2	Areas where apartment blocks are proposed for geotechnical purposes.
BH2, TP117, TP12, TP125, WS10, TP122, TP127, TP101, WS16, WS17	Area of potentially infilled reservoir
WS14, WS14B, TP121, TP123, TP126	Area to remain undeveloped (public open space).
TR101-TR110	To investigate culvert on site and ascertain (if possible) the edge of the potentially infilled reservoir for geotechnical purposes.

Table 3-2: Summary of sampling locations.

With regards to contamination the number of site investigation points (within areas accessible) corresponds to approximately one location per 25m square centres. This is considered to be a conservative sampling density and is in line with BS10175[11] for a 'detailed investigation'.

All profile logs are provided in Appendix B and are in line with BS14688-1[12] and BS5930[13].

3.2 Well Installations

All of the boreholes, apart from WS7C, were installed with monitoring wells for gas, groundwater monitoring and groundwater sampling. Monitoring wells were installed in accordance with BS10175 and CIRIA C665[14] and generally comprised approximately 1-2m plain pipe over a length of slotted pipe surrounded by pea gravel and sealed at the top with bentonite and concrete.

Well installation details are provided in profile logs in Appendix B.

3.3 Sampling Protocol

3.3.1 Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation[15].

Soil was collected for onsite testing. A plastic zip bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested for total volatile organic compounds (TVOCs) using a PhoCheck Tiger photoionisation detector (PID). Results of the PID readings are presented on the

[11] British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.
[12] British Standards (2002) Geotechnical investigation and testing – Identification and Classification of Soil. Part 1: Identification and description. BS EN ISO 14688-1:2002.
[13] British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.
[14] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.
[15] EA (2000). "Technical Aspects of Site Investigation. Volumes 1 & 2 Text Supplements Research and Development Technical Report." P5-065/Tr.

profile logs (Appendix B). The on-site monitoring was carried out in line CIRIA C665[16] to aid in screening samples for volatile analysis.

Soil samples of approximately 500g were recovered in amber jars, amber vials for volatile analysis and plastic tubs. All the samples were labelled and stored in cool boxes prior to being collected by courier at the end of the day for delivery to the Chemtest laboratory in Newmarket for chemical testing. If collection was not possible the same day then samples were stored in the sample storage fridge at the LK Group offices below 4˚C. Samples were tracked using appropriate Chain of Custody forms provided by Chemtest.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix C. Table 3-3 shows the soil testing undertaken.

Suites and Contaminants	No. Samples	Location & Depth		Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	39	WS1 0.10-0.50m WS3 0.10-0.40m WS3B 0.00-0.50m WS4 0.10-0.80m WS5 0.00-0.30m WS6 0.00-0.30m WS7C 0.00-0.60m WS9 0.00-0.60m WS10 0.00-0.30m WS11D 0.50-1.00m WS13 0.00-0.50m WS14B 0.40-1.00m WS15 0.00-0.70m WS17 0.60-1.00m WS18 0.40-1.00m TP102 0.20-0.85m TP104 0.12-0.70m TP105 0.00-1.00m TP106 0.30-1.10m	TP107 0.00-0.30m TP108 0.00-0.30m TP109 0.12-0.65m TP111 010-1.10m TP113 0.00-0.30m TP114 0.20-1.20m TP116 0.00-1.00m TP118 0.20-1.00m TP120 0.10-1.80m TP122 0.30-0.80m TP123 0.30-0.90m TP124 0.10-1.10m TP125 0.30-1.20m TP126 0.30-0.70m TP127 0.10-1.10m TP129 0.10-1.00m TP130 0.00-1.00m TP132 0.00-1.00m TP133 0.00-1.00m	A basic suite with a broad selection of contaminants tested on samples across the site where no significant evidence of contamination was identified (except for occasional ash and coal) and no TVOCs identified from the PID tests.
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and asbestos screen.	15	WS2 0.70-1.00m WS8 0.80-1.50m WS12 0.30-1.00m WS13 0.80-1.70m WS16 0.50-1.50m TP101 0.00-1.00m TP103 1.20-2.20m TP109 2.20m TP112 0.30-1.00m TP115 0.05-0.20m	TP117 0.20-1.20m TP119 0.40-0.80m TP121 0.20-1.10m TP128 0.50-0.90m TP131 0.04-1.40m	Detailed suite undertaken to confirm the contamination risk and to inform the haz-waste assessment for disposal purposes.

Table 3-3. Summary of soil sample testing undertaken.

Notes:
If asbestos present during screen identification and quantification will be undertaken.
Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene and xylenes; MTBE=Methyl tert-butyl ether, SOM=Soil Organic Matter.

[16] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

Suites and Contaminants	No. Samples	Location & Depth	Justification
TPHCWG, BTEX, MTBE and SOM.	1	WS14B 4.00-4.50m	Sample tested to confirm the extent of hydrocarbon contamination observed on upper strata.
Waste Acceptance Criteria (WAC)	9	Composite TP119/TP113 Composite TP110/TP108 0.10-1.10m TP101 0.00-1.00m TP104 0.70-1.30m TP105 1.10-2.10m TP115 0.20-1.20m TP124 0.10-1.10m TP128 0.50-0.90m TP131 0.40-1.40m	To aid in waste classification.
Asbestos Identification	2	TP108 0.80m TP122 0.50m	Samples were tested for asbestos as visual evidence of fibres were observed.

Table 3-3 Continued. Summary of soil sample testing undertaken.
Notes:
If asbestos present during screen identification and quantification will be undertaken.
Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene and xylenes; MTBE=Methyl tert-butyl ether, SOM=Soil Organic Matter.

3.3.2 Water Sampling / Leaching Testing

To establish the condition of shallow groundwater LKC undertook 6 groundwater samples. It was not possible to sample all installed boreholes due to limited groundwater at the time of sampling.

The groundwater samples were collected a minimum of 1 week after drilling had finished and following well development. Sample collection was undertaken using a low flow sampling pump using thin walled tubing to encourage laminar flow and minimise the potential loss of volatiles during sampling The borehole was purged of all standing water and the sample collected from the recharged water. The sample was collected in glass and plastic bottles and a glass vial. A water meter was used to test the pH, temperature and conductivity before sampling until equilibrium conditions were met, as per BS10175[17] guidelines.

All water samples were placed in glass bottles, plastic bottles and septum topped vials and stored in ice packed cool boxes. The samples were sent to Chemtest on the same day for analysis. The sampling suite is presented in Table 3-4.

Sampling was carried out in accordance with BS5930[18] and BS5667-11[19].

Due to insufficient water volume in WS14B, groundwater samples could not be obtained. Therefore, leaching tests were undertaken as an alternative.

It should be noted that the leaching test is an aggressive test and may not give results that are truly representative of the groundwater on site.

Leaching tests were not undertaken across the remainder of the site or in areas of concern (hydrocarbons in the soil), as traditionally the leaching test was developed for

[17] British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.
[18] British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.
[19] British Standard (2009). "Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwaters". BS ISO 5667-11:2009.

inorganic constituents and the leaching of organics is poorly understood[20]. The main risk is expected to be from inorganic contaminants.

Groundwater and leaching test results are presented in Appendix D. Results are discussed in Section 5.4.

Suites and Contaminants	No. Samples	Location	Justification
Metals / metalloids, pH, sulphate, cyanide suite, TPHCWG, BTEX, MTBE, speciated PAHs, phenol and hardness.	6	WS1 (G) WS4 (G) WS5 (G) WS6 (G) WS8 (G) BH3 (G)	Detailed suite undertaken where groundwater present across the site to confirm the absence of contamination.
TPHCWG, BTEX, MTBE and hardness.	3	TP117 0.20-1.20mbgl (L) TP119 0.40-0.80mbgl (L) WS14B 1.60-2.10mbgl (L)	Contamination identified within soils; therefore, detailed suite undertaken where groundwater present across the site to confirm the extent of contamination.

Table 3-4. Summary of groundwater sampling tests undertaken.
Notes:
G=Groundwater Sample, L=Leaching Test
Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene and xylenes; MTBE=Methyl tert-butyl ether.

3.4 Gas Monitoring

Six gas monitoring visits have been undertaken over a 3-month period in all installed boreholes.

Monitoring was undertaken using a Geotechnical Instruments GA2000 plus and GA5000 in accordance with the monitoring protocol outlined in CIRIA C665[21] (flow rate measured first). The monitoring was undertaken over a range of weather conditions (including low and falling barometric pressure and heavy rain) to demonstrate worst-case conditions.

The gas monitoring results are reproduced in full in Appendix E.

3.5 Soakaway Tests

Soakaway tests were undertaken in SA101, SA103, SA104 and SA106 in accordance with BRE Digest 365[22].

It was not possible to carry about the testing in SA105 and SA106 due to deep made ground, instability of the trial pit walls in both locations and shallow groundwater within SA106.

The trial pits were machine excavated to dimensions of 0.5-0.8m wide, 2.0-2.2m long and 1.2-2.0m depth. The arisings were logged in accordance with BS14688-1[23] and BS5930.

[20] EA (2009). "Petroleum Hydrocarbons in Groundwater: Supplementary Guidance for Hydrological Risk Assessment."
[21] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.
[22] BRE (2003) 'Soakaway Design' British Research Establishment BRE Digest 365 2003
[23] British Standards (2002). Geotechnical investigation and testing – Identification and Classification of Soil. Part 1: Identification and description. BS EN ISO 14688-1:2002.

A slotted standpipe was placed vertically in the pit and gravel was backfilled into the bottom of the pit to prevent the sides falling in during water influx.

The pits were filled from a water bowser and the drop in level timed and recorded using a dip meter inside the temporary standpipe.

4 Ground Conditions

4.1 Made Ground

Made ground varied significantly across the site and was recorded between depths of 0.40-13.50mbgl and was primarily reworked natural material. Contours of made ground thickness are present in Geotechnical Assessment report.

In Plot A and in Plot D, outside of tarmacked areas, the made ground was predominantly gravelly sand comprising demolition rubble. Beneath the tarmac in Plot D cobbley sands and gravel of a MOT type material are present to between 0.65mbgl and 0.85mbgl.

A significant thickness of ashy made ground was encountered across the site, predominantly in the east and with increasing thickness further to the east. It would appear that a large area of this site has been infilled prior to the 1890 mapping. The presence of cockle shells, oyster shells and pottery smoking pipes also point to infilling around the early 1800s. 1st Edition Geological Mapping Sheet 104 at 1:10560 Published in 1848 show contours sloping down from the west of the site to the reservoir in the east.

Several obstructions were encountered in the ground during the site investigation works:

- WS11 was repositioned four times (WS11-WS11D) due to the presence of sandstone cobbles (possible former cobbled road) at 0.30-0.40mbgl. Further southeast of this position TP119 encountered a cobbled sandstone road.
- WS7 was re-positioned three times (WS7-WS7C) due to concrete obstructions. These were also encountered in TP110 and TP112. The edges of the slab were located in TR104 and TR105.
- WS3 was repositioned once (WS3-WS3B) due to the presence of a possible void in the mound in the north of site between 1.65-3.30mgl.
- WS3 was repositioned once (WS3-WS3B) due to the presence of a possible void in the mound in the north of site between 1.65-3.30mgl. It is unknown what this feature may be.

Slight hydrocarbon odour relating to large pieces of tarmacadam was identified in WS14B between 1.60-2.00mbgl. Sandstone cobbled setts (with bitumen coating) was noted in TP119 at 0.40-0.50mbgl.

4.2 Natural Strata

Natural superficial deposits generally comprised firm to stiff consistency brown sandy CLAY between 0.40mbgl and 4.30mbgl.

Slightly gravelly clayey SAND was encountered in WS15 below 1.20mbgl.

4.3 Bedrock

Sandstone bedrock was encountered in BH1 at 10.00mbgl, and mudstone bedrock was encountered in BH2 at 7.50mbgl and in BH4 at 10.30mbgl.

Interbedded sandstone, mudstone and siltstone was recorded in RBH1 below 3.00mbgl, and in RBH2 below 13.50mbgl.

The bedrock was noted to have a dip of approximately 20°. Slicken lines and polished surfaces were present within the mudstone showing movement and a plane of weakness.

4.4 Groundwater

4.4.1 Groundwater Levels

Groundwater strikes were recorded during the investigation in trial pits and boreholes. In addition, groundwater monitoring within the borehole wells has been undertaken on two occasions.

Results are summarised in Table 4-1.

BH/TP	Water Strike Depths (mbgl)	Well Response Zone (mbgl)	No. of Monitoring Visits	Monitoring Depths (mbgl)			Sample Taken?	Evidence of Contam?
				Min	Max	Base		
WS1	Dry	1.0-3.0 (C)	6	1.52	2.65	2.87-2.95	Y (G)	N
WS2	4.00	2.0-4.0 (C)	6	1.30	1.80	3.25-3.92	N	N
WS3B	Dry	1.0-3.0 (C)	6	Dry	3.47	3.41-3.54	N	N
WS4	Dry	1.0-3.0 (MG/C)	6	0.78	1.21	3.61-3.68	Y	N
WS5	1.0, 2.1 & 4.5	1.0-4.7 (C)	6	0.75	0.90	4.41-4.47	Y	N
WS6	Dry	0.8-3.0 (C)	6	0.54	1.67	2.82-2.90	Y (G)	N
WS8	4.5	1.0-5.0 (MG/C)	6	3.27	3.80	4.82-4.95	Y (G)	Y*
WS9	Dry	1.0-3.0 (MG/C)	6	Dry	Dry	2.94-3.01	N	N
WS10	Dry	1.0-5.0 (MG)	6	Dry	Dry	4.85-4.94	N	N
WS11D	Dry	1.0-3.0 (C)	6	Dry	1.18	2.79-2.88	N	N
WS12	Dry	1.0-5.0 (C)	6	3.81	3.86	3.93-4.12	N	N
WS13	Dry	1.0-4.0 (MG/C)	6	Dry	3.95	3.88-3.98	N	N
WS14B	Dry	1.0-5.0 (MG/C)	6	Dry	Dry	4.84-4.93	N	N
WS15	2.1	0.8-2.0 (C/S)	6	Dry	1.79	1.80-1.88	N	N
WS16	Dry	1.0-4.0 (MG)	6	Dry	0.49	4.83-4.91	N	N
WS17	Dry	1.0-3.0 (MG)	6	2.86	2.89	2.88-2.97	N	N
WS18	Dry	1.0-4.0 (MG/C)	6	Dry	Dry	3.88-3.97	N	N
BH1	Dry	2.0-10.0 (C)	6	Dry	9.79	9.82-10.10	N	N
BH2	Dry	5.0-8.50 (C/Ms)	6	Dry	Dry	7.96-8.23	N	N
BH3	Dry	1.0-5.5 (C)	6	3.82	4.88	5.34-5.40	N	N
BH4	10.3	1.0-10.0 (MG)	6	9.09	9.61	9.60-9.78	N	N
WS18	Dry	1.0-4.0 (MG/C)	6	Dry	Dry	3.96-3.97	N	N

Table 4-1: Summary of water strike depths within boreholes and trial pits.
Response Zones:
MG=Made Ground; C=Clay; Ms=Mudstone
Notes:
G=Groundwater Sample. * = Slight sheen

All trial pit locations were recorded as dry.

Soakaway Tests

Soakaway tests were also carried out within clay strata at the request of the drainage engineer. The results of the soakaways are presented in Appendix F and summarised in Table 4-2.

BRE365[24] indicates that the calculation of the soil infiltration rate is made from the time taken for the water level to fall from 75% to 25% effective storage depth in each pit.

Soil infiltration rate, $f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

Where:

V_{p75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth.
a_{p50} = the internal surface area of the trial pit up to 50% effective depth including the base area.
t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Due to the slow rate at which water drained, three tests were not carried out in both locations and tests were terminated before the required effective depth. Tests were not successful in any location.

TP	Test No.	Strata at Test Level	Time for outflow between 75% and 25% (mins)	Soil infiltration rate (m/s)
SA101	1	Clay	Not reached	Test Failed
SA102	1	Clay	Not reached	Test Failed
SA103	1	Clay	Not reached	Test Failed
SA104	1	Clay	Not reached	Test Failed
SA105		Clay	Not reached	Test Failed
SA106	1	Clay	Not reached	Test Failed

Table 4-2: Summary of soakaway tests and permeability.

It should also be noted that soakaways are not normally allowed to be installed in made ground.

Based on the above it is unlikely soakaways can be used on the site.

[24] BRE (2003) 'Soakaway Design' British Research Establishment BRE Digest 365 2003

5 Generic Risk Assessment

5.1 Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (CLR11[25]). Information gathered from the risk assessment has been collated in the revised contamination conceptual model in Section 5.6.

5.2 Soil Risk Assessment

5.2.1 Methodology

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs).
- LQM Suitable 4 Use Levels (S4ULs).
- ATRISK Soil Screening Values (SSVs) and CL:AIRE Generic Assessment Criteria (GACs).

C4SLs were published in 2013[26,27]. The recent change to the contaminated land guidance has changed the evaluation of risk from 'minimal' (referred to as Health Criteria values (HCVs))[28] used to generate Soil Guideline Values (SGVs) to 'low' (referred to as Lowest Level of Toxicological Concern (LLTCs)). The policy companion document and supporting letter by Defra, dated 3rd September 2014, states that C4SLs *'could be used under the planning regime, as well as within Part 2A'.* Based on these comments LKC considers the justifications and assumptions used to generate 'low' risk are suitable for the planning regime.

Where no C4SLs have been generated LKC will use the LQM S4ULs[29]. Similar assumptions and land uses to C4SLs have been used. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions[30,31,32,33].

If contaminants are not present as C4SLs and S4ULs then LKC will use ATRISK SSVs or CL:AIRE GACs[34]. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative.

LKC consider the main risk drivers for PAHs are benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P possibly being a carcinogen and most toxic of the

[25] EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.
[26] Defra (2014). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Policy Companion Document."
[27] CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."
[28] EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.
[29] LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."
[30] EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.
[31] EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.
[32] EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.
[33] EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.
[34] CL:AIRE (2009). "The Soil Generic Assessment Criteria for Human Health Risk Assessment."

PAHs[35,36] and naphthalene the most volatile and soluble[37]. The new C4SLs indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible[38]. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)[39] and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

The proposed development is mostly for residential houses with gardens, therefore the assessment criteria for residential with plant uptake has been used for Plots A-D.

For areas where apartment blocks are proposed in Plots A and C, the assessment criteria for residential without plant uptake has been used given that there will be shared soft landscaping only.

The assessment criteria for Public Open Space (Residential) has been used for POS area in the east.

All criteria have been generated using the CLEA V1.06 model[40] based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

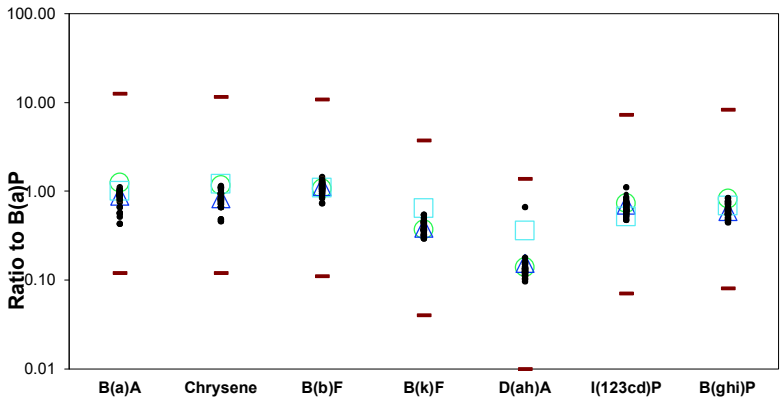
A summary of the generic assessment criteria is provided in Appendix G. ATRISK SSVs and CL:AIRE GACs were not required for this dataset and have not been included.

B(a)P as Surrogate Marker

Based on the above assumption for PAHs, LKC undertook an assessment of the data for the site with regards to using B(a)P as a surrogate marker for carcinogenic PAHs as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et.al*[41], which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

Graph 5-1 summarises the study site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the HPA document.

[35] EA (2002). "Contaminants in Soils: Collation of Toxicological Data and Intake Values for Humans. Benzo[a]pyrene." R&D Publication TOX2.
[36] USEPA (1984). "Health Effects Assessment of Polycyclic Aromatic Hydrocarbons (PAHs). EPA 540/1-86-013."
[37] EA (2003). "Review of the Fate and Transport of Selected Contaminants in the Soil Environment." Draft technical report P5- 079/TR1.
[38] CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."
[39] HPA (2010). "HPA Contaminated Land Information Sheet: Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)." Version 3.
[40] EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.
[41] Culp, S; Gaylor, D; Sheldon, W; Goldstein, L and Beland, F (1998). " A Comparison of Tumours Induced by Coal Tar and Benzo-a-pyrene in a 2-Year Bioassay." Carcinogenesis. **Vol 19**, no. 1, pp. 117-124.



Graph 5-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 45 samples (where values were >LOD to allow the calculation of a ratio).

Notes:
B(a)P = Benzo(a)pyrene; D(ah)A = Dibenzo(ah)anthracene; B(a)A = Benzo(a)anthracene; B(b)F = Benzo(b)fluoranthene;
B(k)F = benzo(k)fluoranthene; I(123cd)P = Indeno(123cd)pyrene; B(ghi)P = Benzo(ghi)perylene
● = Ratio to B(a)P for all data ○ = Mean ratio to B(a)P for Culp data △ = Mean ratio to B(a)P from all data at the site
□ = Mean ratio to B(a)P for UK data presented by HPA ▬ = Upper and Lower limits (order of magnitude from Culp data)

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

Based on this distribution of data LKC considers B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

5.2.2 Soil Results Comparison against Assessment Criteria

All analysis sheets are presented in Appendix C. All the data has been compared to relevant assessment criteria and is presented in Appendix G. Elevated and pertinent results are presented in Table 5-1.

A plan showing the location of the elevated contaminants is present in Figure 5.

Contaminant	Units	No. of samples	Elevated Results	Sample Location	Criteria (1%/2.5%/6%)	Source of Criteria
Metals						
Arsenic	mg/kg	54	62	TP101 (0.0-1.0m)	37 (residential with plant uptake)	C4SL
			99	WS9 (0.0-0.6m)		
			39	WS17 (0.6-1.0m)		
			140	WS16 (0.5-1.5m)		
Lead	mg/kg	54	1000	WS2 (0.7-1.0m)	200 (residential with plant uptake)	C4SL
			1400	WS13 (0.0-0.5m)		
			520	WS3 (0.1-0.4m)		
			210	WS3 (0.8-1.2m)		
			480	TP118 (0.2-1.0m)		
			360	TP119 (0.4-0.8m)		
			300	TP111 (0.1-1.1m)		
			240	TP113 (0.0-0.3m)		
			490	TP101 (0.0-1.0m)		
			710	WS9 (0.0-0.6m)		
			270	WS11D (0.0-0.4m)		
			350	WS7C (0.0-0.6m)		
			430	WS17 (0.6-1.0m)		
			300	WS18 (0.4-1.0m)		
			600	WS16 (0.5-1.5m)		
PAHs						
Benzo(a)pyrene	mg/kg	54	6.5	WS5 (0.0-0.5m)	5 (residential with plant uptake)	C4SL
			9	WS3 (0.1-0.4m)		
			10	WS3 (0.8-1.2m)		
			370	TP119 (0.4-0.8m)		
			23	TP111 (0.1-1.1m)		
			6.4	TP113 (0.0-0.3m)		
			9.0	TP108 (0.0-0.3m)		
			5.4	TP101 (0.0-1.0m)		
			11	WS6 (0.0-0.3m)		
			9.2	WS18 (0.4-1.0m)		
			7.6	TP133 (0.0-1.0m)		
			25	TP129 (0.1-1.0m)		
			11	WS6 (0.0-0.3m)		
			170	WS14B (1.6-2.0m)	10 (POS_{resi})	
			43	TP117 (0.2-1.2m)		
			29	TP125 (0.3-1.2m)		
Naphthalene	mg/kg	54	15	TP119 (0.4-0.8m)	13 (residential with plant uptake)	S4UL
			22	TP111 (01-1.1m)		
TPHs						
Aromatic C21-35	mg/kg	16	2000	TP119 (0.4-0.8m)	1700 (residential with plant uptake)	S4UL
			6400	WS14B (1.6-2.0m)	3800 (POS_{resi})	
GENERAL						
pH	pH	55	Range 7.4-11.5			
SOM	%	55	Range 1.5-48			
Asbestos	N/A	55	Detected (see Table 5-2)			

Table 5-1: Summary of elevated and pertinent analytical results.

Notes:
Only results that exceeded assessment criteria have been shown and results from **all depths** are noted.
Results have been compared to the nearest appropriate SOM.

Asbestos was identified, as detailed in Table 5-2.

Sample Location	ID	Type	Total Asbestos (%)
WS3 (0.10-0.40m)	Chrysotile	Fibres/Clumps	<0.001
TP104 (0.2-0.6m)	Chrysotile	Board fragment	-
TP108 (0.8m)	Chrysotile	Cement fragment	-
TP112 (0.5m)	Chrysotile	Cement fragment	-

Table 5-2: Details of asbestos identified.

5.2.3 Hazard Quotient

To examine the potential additivity of toxicological effects between the petroleum hydrocarbon fractions, a Hazard Index (HI) as described by the Environment Agency[42] technical report was calculated for the samples. This should be undertaken when there are no elevated petroleum hydrocarbons, when compared to assessment criteria of individual fractions. A HI was calculated for WS14B (4.0-4.5m), WS13 (0.8-1.7m) and TP112 (0.3-1.0m), TP101 (0.0-1.0m) and TP117 (0.2-1.2m) and are summarised in Table 5-3. A HI was not calculated for the remaining samples as no or minimal petroleum hydrocarbons fractions were present.

HI results are presented in Table 5-3.

Sample Location	Hazard Index	Further consideration required?
WS14B (4.0-4.5m)	0.65	N
WS13 (0.8-1.7m)	0.09	N
TP112 (0.3-1.0m)	0.30	N
TP101 (0.0-1.0m)	0.06	N
TP117 (0.2-1.2m)	**1.07**	**Y**

Table 5-3: Hazard Index results.

Notes

Bold where HI is >1

5.2.4 Direct Contact Risk – Pollutant Linkage 1

Residential Housing (Proposed Gardens)

Metals

Elevated arsenic (4/ 54 samples) and lead (15/54 samples) have been identified on site, and given the number and location of elevated samples, the contamination is considered to be site wide across Plots A-D in areas where residential houses with private gardens are proposed.

PAHs

Elevated benzo(a)pyrene (as a surrogate marker for carcinogenic PAHs), was identified (13/54 samples) in made ground samples across all plots. The source is anticipated to be coal and ash noted in the soils with exception of the very high concentration at TP119 likely related to small pieces of bitumen chipped off a sandstone cobble sett and not indicative of the composition of surrounding made ground.

[42] EA (2005). "The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils." Science report P5-080/TR3.

Petroleum Hydrocarbons – Heavy End (>EC 16)

Elevated aromatic C21-35 was identified in TP119 (0.4-0.8m) located in Plot B (1/16 samples). As with the high PAH the elevated result is likely related to small pieces of bitumen chipped off a sandstone cobble sett and not indicative of the composition of surrounding made ground. The laboratory interpretation identified the chromatogram as PAH source.

Summary of Pollutant Linkage 1 (Direct Contact) - Residential Housing (Proposed Gardens)

Based on the above assessment LKC considers at the distribution of exceedances identified, the contaminants are considered to pose a potential risk to future site users (residents) in gardens and soft landscaped areas, where made ground may be exposed / in contact with vegetables. The principal pathways are the ingestion pathways (soil, dust and vegetables) and dermal contact.

LKC considers the probability of metals and PAHs affecting site users (via ingestion and dermal contact) as likely in gardens of residential houses. Given a medium consequence a moderate risk is considered appropriate and remediation is recommended.

LKC considers the probability of petroleum hydrocarbons affecting site users (via ingestion and dermal contact) as unlikely in gardens of residential houses. Given a medium consequence a low risk is considered appropriate and remediation is not considered necessary for petroleum hydrocarbons.

Apartment Blocks (Landscaping)

Metals

No elevated metals identified above the criteria for the proposed apartment block areas in Plots A and C.

PAHs

No elevated PAHs identified above the criteria for the proposed apartment block areas in Plots A and C.

Petroleum Hydrocarbons – Heavy End (>EC 16)

No elevated petroleum hydrocarbons identified above the criteria for the proposed apartment block areas in Plots A and C.

Summary of Pollutant Linkage 1 (Direct Contact) - Residential Apartment Blocks (Proposed Landscaping)

Based on the above assessment LKC considers the probability of metals. PAHs and petroleum hydrocarbons affecting site users (via ingestion and dermal contact) as unlikely in landscaped areas of apartment blocks. Given a medium consequence a low risk is considered appropriate and remediation is not considered necessary for these contaminants.

Please note the apartment block locations need to be finalised and areas where trees were present could not be accessed.

Public Open Space

Metals

No elevated metals identified above the criteria for the proposed POS area.

PAHs

Elevated PAHs were noted in the POS area (3/10 samples). All appear to be related to the occasional tarmacadam fragments identified. The laboratory interpretation identified the chromatogram as PAH source.

LKC considers these discrete pieces of tarmacadam are not considered to be representative of the ground conditions as a whole. In addition, the area is not to be developed and will be managed and maintained by a private contractor. Significant exposure is not anticipated.

Petroleum Hydrocarbons

Elevated aromatic EC21-35 was identified in WS14B (1.6-2.0m) within the POS area. Visual/olfactory evidence of hydrocarbon contamination was also identified at WS14B in the form of lumps of tarmacadam fragments. Confirmed as PAHs form chromatogram.

Traces of heavy end hydrocarbons (not above assessment criteria) were identified in TP117 (0.2-1.2m). The hazard index of this sample was above 1 and further consideration is required.

As for PAHs the source is likely for discrete tarmacadam fragments and not considered to be representative of the ground conditions as a whole. Tarmacadam is known to comprise heavy end hydrocarbons, such as PAHs[43]. The matrix of tarmacadam comprises inert aggregate surrounded by bitumen, thus may not be in a form that can readily be ingested, absorbed through the skin or inhaled (dust) due to grain size). The laboratory preparation comprises crushing the sample and not be in a form that would be significantly observed onsite (much finer grain if crushed).

Summary of Pollutant Linkage 1 (Direct Contact) – POS Area

Based on the above assessment LKC considers at the distribution of exceedances identified in the POS area is not considered to pose a significant risk to potential key receptors considering exceedances relate to discrete tarmacadam fragments (relatively inert) and not considered to be representative of the ground conditions as a whole. In addition, the area is not to be developed and will be managed and maintained by a private contractor. Significant exposure is not anticipated.

LKC considers the probability of PAHs and petroleum hydrocarbons affecting site users (via ingestion and dermal contact) as unlikely for the POS area. Given a medium consequence a low risk is considered appropriate and remediation is not required.

[43] Kim E. Grosenheider, Paul R. Bloom, Thomas R. Halbach and Marilyn R. Johnson (2006). "A Review of the Current Literature Regarding Polycyclic Aromatic Hydrocarbons in Asphalt Pavement." University of Minnesota.

Asbestos

Asbestos (Chrysotile) was identified in WS3, TP104, TP18 and TP112. The asbestos was identified as free fibres in WS3, board in TP104 and cement in TP108 and TP112. The source of the asbestos is likely to be from demolished buildings. These were all located in the proposed residential housing part of the site.

Given the size of the site (over 4 hectares) and the number of samples containing asbestos in the soil (1 out of 55 samples) and 3 other discrete samples where visual evidence was identified (no fibres detected within the soil analysis in these locations), these samples are expected to be relatively limited / localised to the north of the site in Plots D and C.

LKC have utilised the Joint Industry Working Group (JIWG) Decision Support Tool for receptor risk ranking of ACM onsite. This model incorporates guidance from CL:AIRE CAR-SOIL[44] and CIRIA C733[45].

In this model a child of school age playing in the landscaped area for 1 hour was assumed in close proximity to the source. A medium respirable index was assumed base on the ACM identified onsite as per RIVM[46].

The assessment was carried out assuming 'low disturbance' based on ACM at a shallow depth.

For added conservatism, the model does not take into account moisture content, which can significantly reduce the potential for airborne fibre release from soil in a typical UK climate. AGS interim guidance[47], based on work by Addison et al[48], notes that the addition of 10% water to soil decreases the risk of potential fibre release by a factor of between 2 and 10. The moisture content of the soil from this area was 10-14% making fibre release unlikely.

Data from Addison *et al* shows that a sandy soil with Chrysotile fibre concentrations of 0.01%w/w (1 order of magnitude lower recorded) when agitated in a moderately aggressive way, produced between 0.01fibres/ml and no recordable fibres at moisture contents of 5% and above. It should be noted that the clearance level is 0.01f/ml.

The JWIG model output sheet is presented in Appendix J. A **low risk** was identified to key receptors based on general worst case scenario, such as some ground disturbance.

Asbestos may affect site users in garden areas in areas of the site, via the inhalation of fibres. Considering limited fibre within the soil (1/55 samples) and evidence of 3 discrete small ACM pieces the probability is considered to be low and with a medium consequence the risk is considered moderate / low for the area of residential housing and low for the rest of the site. The removal of the source and hand picking any visible pieces will mitigate the risk. Furthermore, there will be a clean capping layer in gardens to remove any direct contact pathway.

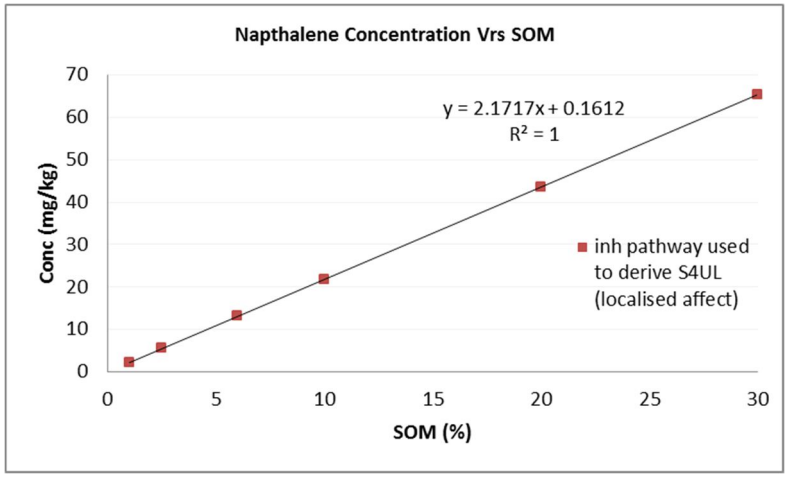
[44] CL:AIRE (2016). "CAR-SOIL Controlled Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials" Industry Guidelines.
[45] CIRIA (2014). "Asbestos in Soil and Made Ground: A guide to Understanding and Managing Risks." CIRIA C733.
[46] RIVM (2003). "Assessment of the Risks of Soil Contamination with Asbestos" CIRIA C733." RIVM Report 711701034/2003.
[47] AGS (2013). "Site Investigation Asbestos Risk Assessment." AGS Interim Guidance, Feb 2013, Ver 2.4.
[48] Addison et al (1988). "The Release of Dispersed Asbestos Fibres from Soils." Institute of Occupational Medicine Report No. TM/88/14.

Additional consideration should also be given to the risk to workers and offsite receptors during groundworks and construction. This is discussed further in Section 8.1.

5.2.5 *Risk from Inhalation of Vapours – Pollutant Linkage 2*

Naphthalene was elevated in TP119 (0.4-0.8m) and TP111 (0.1-1.1m) at concentrations of 15mg/kg and 22mg/kg respectively. The SOM values for these samples are 48% (TP119) and 8.3% (TP111).

There is a linear relation (r^2=1) between Naphthalene and SOM concentrations (see Graph 5-2).



Graph 5-2: Naphthalene vs. SOM

The modified assessment criteria for naphthalene (lowest SOM of 8.3%) is calculated as 18mg/kg. When using the above formula only TP111 (0.1-1.1m) marginally exceeds this modified criterion and may pose a low risk to site users via the inhalation of vapours.

Given that only one marginal exceeds has been identified out of 54 samples, it is not considered to be representative of the ground conditions on site as a whole. The source as discussed previously is likely related to small discrete pieces of tarmacadam, which is not representative of the surrounding made ground matrix. No other elevations were identified from confirmatory soil analysis or high PID readings encountered.

Therefore, LKC consider the probability of volatile contaminants affecting site users as unlikely across the site. The consequence is expected to be medium, giving a low risk and no remediation is required with respect to pollutant linkage 2.

5.3 Gas Risk Assessment

A total of six gas monitoring visits were undertaken over a three month period. Gas monitoring results in full are presented in Appendix E. Following guidance set out in CIRIA C665[49] and BS8485[50] peak methane and carbon dioxide concentrations have been used in the gas risk assessment. In addition, and as per guidance, flow rates were measured first.

All gas concentrations, flow, pressure and groundwater levels are shown on Table 5-4.

Boreholes	Visit	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	H_2S (ppm)	CO (ppm)	Flow (l/h)	Groundwater (mbgl)	Pressure (mb)
WS1	1	0.1	1.8	14.5	<0.1	<0.1	<0.1	1.52	1010 (r)
	2	<0.1	3.3	14.3	<0.1	<0.1	4.3	2.43	1007 (r)
	3	0.1	3.8	12.7	<0.1	5.0	0.1	2.32	1012 (r)
	4	<0.1	4.3	13.7	<0.1	1.0	<0.1	2.65	1006 (f)
	5	<0.1	4.3	14.2	<0.1	<0.1	<0.1	2.56	1003 (r)
	6	0.0	4.2	15.9	<0.1	<0.1	<0.1	2.38	1021 (r)
WS2	1	<0.1	<0.1	19.7	<0.1	<0.1	<0.1	1.80	1010 (r)
	2	<0.1	<0.1	20.8	<0.1	<0.1	<0.1	1.57	1007 (r)
	3	<0.1	0.4	20.8	<0.1	1.0	<0.1	1.45	1012 (r)
	4	0.1	0.5	13.7	<0.1	1.0	-0.1	1.79	1004 (f)
	5	<0.1	0.6	20.5	<0.1	<0.1	<0.1	1.80	1006 (r)
	6	<0.1	1.1	16.0	<0.1	<0.1	<0.1	1.36	1021 (r)
WS3B	1	<0.1	0.1	20.5	<0.1	<0.1	<0.1	3.47	1009 (r)
	2	<0.1	0.9	19.9	<0.1	<0.1	<0.1	3.44	1007 (r)
	3	<0.1	1.2	19.9	<0.1	3.0	<0.1	3.43	1012 (r)
	4	<0.1	1.0	20.8	<0.1	3.0	<0.1	Dry	1006 (r)
	5	<0.1	1.0	20.9	<0.1	<0.1	<0.1	Dry	1003 (r)
	6	0.0	0.9	20.7	<0.1	<0.1	<0.1	Dry	1021 (r)
WS4	1	<0.1	<0.1	19.8	<0.1	<0.1	<0.1	1.04	1010 (r)
	2	<0.1	<0.1	9.3	<0.1	<0.1	0.3	0.80	1007 (r)
	3	0.1	<0.1	6.2	<0.1	<0.1	<0.1	0.81	1012 (r)
	4	0.1	<0.1	4.6	<0.1	<0.1	<0.1	1.21	1006 (f)
	5	0.1	0.5	3.5	<0.1	<0.1	0.1	0.78	1003 (r)
	6	0.0	0.5	4.0	<0.1	<0.1	-0.1	0.83	1021 (r)
WS5	1	<0.1	0.1	20.3	<0.1	<0.1	<0.1	0.84	1010 (r)
	2	<0.1	0.5	19.4	<0.1	<0.1	<0.1	0.76	1007 (r)
	3	0.1	5.0	19.1	<0.1	8.0	<0.1	0.76	1012 (r)
	4	0.1	0.6	19.8	<0.1	3.0	<0.1	0.90	1005 (f)
	5	0.1	0.6	19.8	<0.1	<0.1	-0.2	0.75	1002 (r)
	6	0.1	0.6	20.4	<0.1	<0.1	0.1	0.76	1020 (r)

Table 5-4: Summary of gas monitoring.

Notes:

If concentrations / flow is zero, then equipment detection limits are assumed.
Table shows peak concentrations of CH_4, CO_2, O_2, H_2S and CO.
Bold where CO_2 exceeds 5%v/v and CH_4 exceeds 1%v/v.
Atmospheric pressure (over past 24hrs): r=rising, f=falling, s=steady

[49] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.
[50] BSI (2015). "Code of Practice for the Characterisation and Remediation from Ground Gas in Affected Developments." BS8485:2015.

Boreholes	Visit	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	H_2S (ppm)	CO (ppm)	Flow (l/h)	Groundwater (mbgl)	Pressure (mb)
WS6	1	<0.1	1.4	19.8	<0.1	<0.1	<0.1	1.67	1010 (r)
	2	<0.1	1.1	19.8	<0.1	<0.1	<0.1	0.84	1007 (r)
	3	0.1	0.5	20.7	<0.1	1.0	<0.1	1.69	1012 (r)
	4	<0.1	2.2	18.8	<0.1	2.0	<0.1	1.11	1006 (f)
	5	<0.1	1.1	20.7	<0.1	<0.1	<0.1	0.54	1002 (r)
	6	<0.1	1.5	21.6	<0.1	<0.1	-0.1	0.59	1021 (r)
WS8	1	<0.1	2.2	18.1	<0.1	<0.1	<0.1	3.73	1011 (r)
	2	<0.1	2.2	16.6	<0.1	3.0	<0.1	3.80	1008 (r)
	3	0.1	3.9	15.1	<0.1	4.0	<0.1	3.54	1012 (r)
	4	<0.1	3.8	15.8	<0.1	<0.1	0.2	3.63	1007 (f)
	5	<0.1	**6.8**	0.5	<0.1	<0.1	<0.1	3.38	1004 (r)
	6	<0.1	3.4	14.5	<0.1	<0.1	<0.1	3.27	1021 (r)
WS9	1	<0.1	1.6	20.0	<0.1	<0.1	<0.1	Dry	1008 (r)
	2	<0.1	2.5	17.5	<0.1	2.0	-0.2	Dry	1008 (r)
	3	0.1	3.2	17.0	<0.1	1.0	<0.1	Dry	1012 (r)
	4	<0.1	2.6	18.6	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	<0.1	3.2	16.0	<0.1	<0.1	-0.1	Dry	1005 (r)
	6	<0.1	2.5	18.7	<0.1	<0.1	<0.1	Dry	1022 (r)
WS10	1	<0.1	4.1	14.4	<0.1	<0.1	<0.1	Dry	1008 (r)
	2	<0.1	**11.1**	1.8	<0.1	2.0	<0.1	Dry	1008 (r)
	3	0.1	**6.4**	13.4	<0.1	<0.1	<0.1	Dry	1012 (r)
	4	<0.1	3.5	17.3	<0.1	1.0	<0.1	Dry	1007 (f)
	5	<0.1	1.1	19.9	<0.1	<0.1	<0.1	Dry	1004 (r)
	6	<0.1	**9.7**	4.8	<0.1	<0.1	<0.1	Dry	1022 (r)
WS11D	1	<0.1	1.5	20.0	<0.1	<0.1	<0.1	Dry	1007 (r)
	2	<0.1	1.3	20.2	<0.1	<0.1	<0.1	Dry	1008 (r)
	3	<0.1	1.8	19.7	<0.1	1.0	<0.1	Dry	1012 (r)
	4	<0.1	1.2	20.8	<0.1	2.0	<0.1	Dry	1007 (f)
	5	<0.1	1.4	20.0	<0.1	<0.1	<0.1	Dry	1005 (r)
	6	<0.1	1.1	20.2	<0.1	<0.1	<0.1	1.18	1022 (r)
WS12	1	<0.1	0.9	20.6	<0.1	<0.1	<0.1	3.81	1008 (r)
	2	<0.1	1.4	20.2	<0.1	<0.1	<0.1	3.81	1008 (r)
	3	0.1	1.7	19.3	<0.1	<0.1	<0.1	4.80	1012 (r)
	4	<0.1	1.4	20.5	<0.1	<0.1	<0.1	3.83	1007 (f)
	5	<0.1	1.7	19.3	<0.1	<0.1	<0.1	3.86	1005 (r)
	6	>0.1	1.8	19.8	<0.1	<0.1	<0.1	3.85	1022 (r)
WS13	1	<0.1	0.0	20.7	<0.1	<0.1	<0.1	3.93	1009 (r)
	2	<0.1	0.8	20.8	<0.1	<0.1	0.2	4.95	1008 (r)
	3	0.1	0.9	19.8	<0.1	<0.1	<0.1	3.95	1012 (r)
	4	<0.1	0.8	20.8	<0.1	1.0	<0.1	Dry	1006 (f)
	5	<0.1	0.8	20.6	<0.1	<0.1	<0.1	Dry	1003 (r)
	6	<0.1	0.7	20.7	<0.1	<0.1	<0.1	Dry	1021 (r)
WS14B	1	<0.1	2.7	14.7	<0.1	<0.1	<0.1	Dry	1010 (r)
	2	<0.1	**6.1**	12.4	<0.1	2.0	0.2	Dry	1008 (r)
	3	0.1	**5.4**	13.6	<0.1	<0.1	<0.1	Dry	1012 (r)
	4	<0.1	4.3	16.6	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	0.1	2.5	18.7	<0.1	<0.1	<0.1	Dry	1004 (r)
	6	<0.1	4.2	15.4	<0.1	<0.1	<0.1	Dry	1022 (r)
WS15	1	0.1	2.0	16.2	<0.1	<0.1	<0.1	1.79	1009 (r)
	2	<0.1	0.4	20.4	<0.1	2.0	<0.1	1.71	1008 (r)
	3	0.1	0.9	20.6	<0.1	2.0	<0.1	1.53	1012 (s)
	4	<0.1	1.7	20.6	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	<0.1	1.4	18.2	<0.1	<0.1	<0.1	1.61	1006 (r)
	6	<0.1	1.8	19.8	<0.1	<0.1	<0.1	1.62	1022 (r)

Table 5-4 Continued: Summary of gas monitoring.

Notes:

If concentrations / flow is zero, then equipment detection limits are assumed.
Table shows peak concentrations of CH_4, CO_2, O_2, H_2S and CO.
Bold where CO_2 exceeds 5%v/v and CH_4 exceeds 1%v/v.
Atmospheric pressure (over past 24hrs): r=rising, f=falling, s=steady

Boreholes	Visit	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	H_2S (ppm)	CO (ppm)	Flow (l/h)	Groundwater (mbgl)	Pressure (mb)
WS16	1	0.1	**13.0**	6.0	<0.1	<0.1	<0.1	Dry	1007 (r)
	2	<0.1	**7.5**	14.0	<0.1	1.0	<0.1	Dry	1008 (r)
	3	0.1	**9.0**	10.4	<0.1	1.0	<0.1	Dry	1012 (s)
	4	0.1	**10.1**	9.1	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	<0.1	**10.7**	8.0	<0.1	<0.1	<0.1	Dry	1005 (r)
	6	<0.1	**10.8**	6.6	<0.1	<0.1	<0.1	0.49	1022 (r)
WS17	1	0.1	2.3	16.2	<0.1	<0.1	<0.1	2.86	1009 (r)
	2	<0.1	2.5	17.5	<0.1	2.0	-0.1	2.89	1008 (r)
	3	0.1	2.9	16.0	<0.1	<0.1	<0.1	2.88	1012 (s)
	4	<0.1	3.6	14.4	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	<0.1	3.7	12.8	1.0	<0.1	-0.1	2.86	1006 (r)
	6	<0.1	3.8	12.5	<0.1	<0.1	<0.1	2.87	1023 (r)
WS18	1	0.0	0.0	21.1	<0.1	<0.1	<0.1	Dry	1009 (r)
	2	0.0	0.1	21.2	<0.1	3.0	<0.1	Dry	1008 (r)
	3	<0.1	4.2	14.9	<0.1	4.0	<0.1	Dry	1012 (s)
	4	<0.1	4.8	15.2	<0.1	4.0	0.1	Dry	1007 (f)
	5	0.0	**5.2**	13.8	<0.1	<0.1	0.1	Dry	1006 (r)
	6	Unable to monitor						Dry	1023 (r)
BH1	1	0.0	4.2	8.3	<0.1	<0.1	<0.1	Dry	1008 (r)
	2	0.0	0.2	20.9	<0.1	<0.1	<0.1	Dry	1007 (r)
	3	<0.1	1.1	19.1	<0.1	1.0	<0.1	9.79	1012 (s)
	4	<0.1	4.7	13.4	<0.1	<0.1	<0.1	9.78	1007 (f)
	5	0.0	**5.3**	6.9	<0.1	<0.1	-0.7	9.83	1007 (r)
	6	0.0	5.2	10.3	<0.1	<0.1	<0.1	9.78	1022 (r)
BH2	1	0.0	0.7	19.9	<0.1	<0.1	0.0	Dry	1008 (r)
	2	0.0	2.7	17.4	<0.1	9.0	0.0	Dry	1008 (r)
	3	<0.1	3.6	16.1	<0.1	2.0	<0.1	Dry	1012 (s)
	4	<0.1	1.5	20.2	<0.1	<0.1	<0.1	Dry	1007 (f)
	5	0.0	3.0	16.6	<0.1	<0.1	0.1	Dry	1005 (r)
	6	0.0	2.3	18.2	<0.1	<0.1	<0.1	Dry	1022 (r)
BH3	1	0.0	1.8	18.2	<0.1	<0.1	0.0	3.85	1007 (r)
	2	0.0	0.2	21.0	<0.1	<0.1	0.0	3.88	1008 (r)
	3	<0.1	2.0	17.9	<0.1	1.0	<0.1	3.85	1012 (s)
	4	<0.1	1.8	19.6	<0.1	<0.1	<0.1	4.88	1007 (f)
	5	0.0	1.9	18.3	<0.1	<0.1	0.0	3.82	1005 (r)
	6	0.0	1.8	17.7	<0.1	<0.1	<0.1	3.75	1022 (r)
BH4	1	0.1	1.8	18.3	<0.1	<0.1	0.0	9.57	1009 (r)
	2	0.0	**6.9**	13.8	<0.1	9.0	-0.2	9.62	1008 (r)
	3	0.1	3.9	17.0	<0.1	<0.1	<0.1	9.61	1012 (s)
	4	<0.1	4.3	17.2	<0.1	<0.1	<0.1	Dry	1007 (s)
	5	0.0	**7.2**	12.5	<0.1	<0.1	0.0	9.09	1006 (r)
	6	0.0	3.2	16.7	<0.1	<0.1	<0.1	9.48	1021 (r)

Table 5-4 Continued: Summary of gas monitoring.

Notes:

If concentrations / flow is zero, then equipment detection limits are assumed.
Table shows peak concentrations of CH_4, CO_2, O_2, H_2S and CO.
Bold where CO_2 exceeds 5%v/v and CH_4 exceeds 1%v/v.
Atmospheric pressure (over past 24hrs): r=rising, f=falling, s=steady

Generally, flow readings across the site during all monitoring visits were very low to negligible. The highest flow reading was recorded in WS1 (4.3l/hr) but this is likely to be associated with barometric pumping and high groundwater level during that visit causing an artificially high flow rate. As no other flow rate above 0.1l/hr was recorded in WS1 on subsequent visits, the elevated flow rate of 4.3l/hr is considered an anomaly has not been used in the derivation of worst case gas screening values.

As expected, locations in the former infilled reservoir recorded the highest levels of carbon dioxide concentrations with WS110, WS14B and WS16 generally being the locations where Carbon Dioxide exceeded 5%v/v with the maximum concentration recorded in WS16 (13%v/v).

Three other locations outside of the infilled reservoir also recorded carbon dioxide above 5%v/v; WS8 on one occasion (6.8%v/v), WS18 on one occasion (5.2%v/v) and BH4 on two occasions (maximum of 7.2%v/v).

Minimal methane was recorded during both visits (maximum 0.1%v/v).

Carbon monoxide was >1ppm in boreholes WS8, WS9, WS10, WS14B, WS15, WS17, WS18, BH2 and BH4. The maximum concentration was recorded as 9ppm (BH2 and BH4).

Only workplace exposure limits defined by the HSE are available for carbon monoxide and are not fully applicable to a residential setting. A Short-Term Exposure Limit of 200ppm (15-minute period) and Long-Term Exposure Limit of 30ppm have been defined (8-hour period).

Based on the above exposure limits, carbon monoxide is not expected to pose a significant risk to the proposed site receptors.

Gas Screening Value

In accordance with CIRIA C665[51], a Gas Screening Value (GSV) may be calculated. Assuming worst-case scenario maximum gas concentrations and flow for each borehole have been used to calculate the GSV. The GSV can be used to determine the characteristic situation (CS).

Table 5-5 shows the maximum GSV for each borehole and the appropriate characteristic situation (based on GSV only).

Boreholes	Max GSV (l/hr)	CS
WS1	0.0048	CS1
WS2	<0.001	CS1
WS3	0.0012	CS1
WS4	0.0015	CS1
WS5	0.010	CS1
WS6	0.0022	CS1
WS8	0.014	CS1
WS9	0.006	CS1
WS10	0.011	CS1
WS11D	0.0018	CS1
WS12	0.0018	CS1
WS13	0.0018	CS1
WS14B	0.012	CS1
WS15	0.0017	CS1
WS16	0.013	CS1
WS17	0.0038	CS1
WS18	0.0052	CS1
BH1	0.0371	CS1
BH2	0.0036	CS1
BH3	0.003	CS1
BH4	0.0144	CS1

Table 5-5: Summary of worst-case Gas Screening Values (GSV) for each location.
Notes:
CS – Characteristic Situation

Based on the worst case GSVs, all locations would be placed within a CS1 scenario, but some monitoring visits had carbon dioxide above 5%v/v

[51] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

However, in accordance with CIRIA C665[52], if carbon dioxide and methane are recorded above 5%v/v and 1%v/v respectively, you should consider upgrading the characteristic situation from CS1 to CS2.

Due to the number of visits with relatively high carbon dioxide (above 5%v/v) around WS16 and in proximity in the former infilled reservoir to the east (proposed POS area), LKC consider that the eastern section of Plot B (shown on Figure 6 (Remediation Plan)) should be treated as CS2.

Carbon dioxide concentrations were also recorded above 5%v/v in WS10 and WS14B in the area of the former infilled reservoir on a number of monitoring visits. These boreholes are located within the POS area where no buildings are proposed and minimal flow readings (maximum 0.2l/hr) identified. Any gasses can freely vent into the atmosphere. Taking this into account and negligible flow rates to drive any gas migration to residential areas outside the POS, LKC do not consider remediation necessary for this area of the site unless development is to take place, in which case CS2 gas protection measures would be considered a conservative measure.

The other locations where carbon dioxide has exceeded 5%v/v (WS8, WS18 and BH4) did so on only one or two occasions with the maximum concentration being 7.2%v/v. Flow rates in these locations were negligible. WS18 and BH4 are located in the south of the site where deeper made ground has been recorded and WS8 also recorded made ground to around 4mbgl. The deeper made ground may account for the occasional slightly elevated CO_2 levels, but no significant putrescible or degradable material has been identified and material appears to be inert. As the levels are only marginally elevated on one or two occasions and the flow rates negligible, LKC do not consider there to be enough evidence to uprate these locations to CS2. Any residual gas from within the made ground does not seem to be generating any significant flow rates.

For added comfort it should be noted RB17[53] states that with regards to carbon dioxide glacial deposits *'can often be recorded up to 15% in monitoring wells. But this does not pose a risk to development'*. Maximum concentration of carbon dioxide was identified at these concentrations. The underlying Glacial Till deposit could generate some of the carbon dioxide (inclusions of coal and silt) and contribute to the gas concentrations, but as stated earlier with limited flow rates to drive any migration and therefore unlikely to be a risk to future residents.

A depletion of oxygen was noted in some boreholes (not consistent), but all had limited flow rates and no significant carbon dioxide gas production (except WS16). This is likely to be an artefact of the drilling process and perched groundwater and not indicative of true in-ground oxygen levels at the site.

Based on the results of the gas monitoring and above assessment, LKC consider the probability of carbon dioxide and methane affecting site users and buildings across a majority of the site to be unlikely and no remediation is required.

However, in a localised area in the east of Plot B, the probability of carbon dioxide affecting site users and buildings is considered to be low but, with a severe consequence, a moderate risk is given. Precautionary gas protection measures in line with CS2 are recommended in buildings in proximity to WS16 due to consistent carbon dioxide >10%v/v (but <15%v/v), as shown in Figure 6.

[52] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.
[53] CL:AIRE Research Bulletin 17. "A Pragmatic Approach to Ground Gas Risk Assessment". November 2012.

5.4 Controlled Water Assessment

LKC considers the Secondary A Aquifer as the primary receptor.

Groundwater samples were collected from selected boreholes and additional leachate tests were undertaken on soil samples where no groundwater was available for sampling. All analysis sheets for groundwater and leachate tests are presented in Appendix C.

LKC have compared results above Limits of Detection (LOD). Where relevant the review of priority substances takes precedence considering threshold values for groundwater cannot be used '*as part of site-specific investigations*'. The hierarchy is as follows:

- River Basin District Standards[54] and updated Water Framework Directive[55] for Annual Average / Maximum Allowable Concentration Environmental Quality Standards (AA-MAC-EQS) for priority substances (surface water risk).
- 2016 private water supply standards (UKDWS potable)[56].
- 2001 Environment Agency Values for Environmental Quality Standards (EQS) and UK Drinking Water Standard (UKDWS)[57].

With regards to hydrocarbon mixtures (TPHCWG) for UKDWS, LKC will use the CL:AIRE guidance on petroleum hydrocarbons in groundwater[59] based on WHO guidelines.

No criteria values have been presented for surface waters (EQS) except the odour, visual evidence and taste test for fish[60]. However, criteria for each banding has been presented by WHO within the CL:AIRE report for drinking water and will be used in the assessment.

It should be noted that the leaching test is aggressive (de-ionised water) and is not in aqueous equilibrium (steady state) with the solid sample. This may cause rapid dissolution and overestimation of the aqueous phase concentrations compared to groundwater in contact with contaminated soils. Although dissolution may be reduced for highly hydrophobic contaminants[61], such as B(a)P it is likely that the initial leaching will remove the most readily available hydrocarbons and subsequent flushing would reduce the leachable concentrations[62]. Traditionally the leaching test was developed for inorganic constituents and the leaching of organics is poorly understood[63].

Elevated contaminants above limits of detection are presented in Table 5-6 below and all analysis sheets are presented in Appendix E.

[54] Defra (2010). "The River Basin Districts Typology, Standards and Groundwater Threshold Values". Water Framework Directive (England and Wales) Directions 2010.
[55] Defra (2015). " Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015".
[56] Statutory Instruments (2016). "The Private Water Supplies Regulation 2016." No. 614
[57] EA (2002). "Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the Environment Protection Act 1990."
[59] CL:AIRE (2017). "Petroleum Hydrocarbons in Groundwater: Guidance on Assessing Petroleum Hydrocarbons Using Existing Hydrological Risk Assessment Methodologies."
[60] EA (2009). "Petroleum Hydrocarbons in Groundwater: Supplementary Guidance for Hydrological Risk Assessment."
[61] EA (1999)."Methodology for the Derivation of Remedial Targets for the Soil and Groundwater to Protect Water Resources." R&D Technical Report, P20
[62] EA (2006)."Remedial targets Methodology: Hydrological Risk Assessment for Land Contamination."
[63] EA (2009). "Petroleum Hydrocarbons in Groundwater: Supplementary Guidance for Hydrological Risk Assessment."

Contaminant	Units	No. of samples	Elevated Result	Location	GAC	Source of Criteria
Metals						
Manganese	µg/l	6	380	WS6	10	UKDWS
			630	WS8		
			790	WS4		
			160	WS5		
			590	BH3		
			730	WS1		
TPH						
Aro >EC8-EC10 (ethylbenzene)	µg/l	7	900	WS14B	300	WHO
Aro >EC8-EC10 (xylene)	µg/l	7	730	WS14B	500	WHO
Aro >EC10-EC12	µg/l	7	940	WS14B	90	WHO
Aro >EC12-EC16	µg/l	7	550	WS14B	90	WHO
Aro >EC16-EC21	µg/l	7	940	WS14B	90	WHO
Aro >EC21-EC35	µg/l	7	730	WS14B	90	WHO
Ali >EC8-EC10	µg/l	7	2,300	WS14B	300	WHO
Ali >EC10-EC12	µg/l	7	1,100	WS14B	300	WHO

Table 5-6: Summary of elevated groundwater and leaching test results.
Notes:
[2] = Based on hardness
EQS (2001) and AA / MAC-EQS (2015) = surface water criteria.
UKDWS (2001, 2016) and WHO (2017) = Groundwater criteria (potable supply).
Results above LOD's presented.

Only manganese exceedances were recorded in the groundwater samples tested (maximum concentration of 790µg/l) but this was compared to a UKDWS of 10µg/l which is considered overly conservative for a Secondary A Aquifer with no groundwater abstractions within 250m. These determinands are unlikely to be a detriment to the study site, since values are based on stringent UKDWS and aesthetic consideration. Furthermore, it is well known that manganese exist as colloids which may pass through standard 0.45 micron filters[64,65], thus over estimating dissolved concentrations.

No free product was noted in any water samples

No elevated concentrations of TPH were recorded in any groundwater samples collected but one sample of soil from WS14B subjected to leaching tests recorded elevated TPH fractions when compared to WHO assessment criteria for drinking water. These exceedences are likely to be related to tarmacadam fragments identified in made ground and not true representation of the true groundwater body. Therefore, although exceedences of conservative drinking water standards have been identified, the localised nature of the contamination is not considered to pose a risk to the wider Secondary A Aquifer below the site.

Based on the above, LKC considers the probability of contaminants on site affecting the Secondary A Aquifer as unlikely. Given the medium consequence, a low risk is anticipated (Pollutant Linkage 4) and no remediation is required.

[64] Boult, S (1996). "Fluvial Metal Transport Near Sources of Acid Mine Drainage: Relationship of Soluble, Suspended and Deposited Material." *Mineralogical Magazine*. **60**:325-335.
[65] Kennedy, V. Zellweger, GW. Blair, FJ (1974). "Filter Pore Size Effects on the Analysis of Al, Fe, Mn and Ti in Water." Water Resources Research. **10**(4):785-790.

5.5 Additional Risk Assessments

5.5.1 Concrete (Pollutant Linkage 5)

Based on BRE Digest 2005[66] it is unlikely that sulphate resistant concrete will be required across the majority of the site and DS-1 AC-1 is deemed acceptable.

Elevated sulphate was only encountered within TP112 (0.30-1.00m), TP121 (0.20-1.10m) and WS5 (0.00-0.30m). TP121 is located within the area of POS so no development is proposed, therefore the elevation should not pose a risk.

The other locations are within the proposed residential areas. Should this made ground still be in place once reduction of levels has taken place then sulphate resistant concrete DS-2 AC-1s may be required in these areas.

This should be confirmed with the structural engineer.

5.5.2 Potable Water Supply (Pollutant Linkage 6)

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination[67]. Only contaminants of concern, based on the preliminary conceptual model and ground conditions encountered, were analysed. The following contaminants were not considered to be a risk and therefore not included in the analysis suites: speciated petroleum hydrocarbons, chlorinated compounds, BTEX compounds, phenols, cresols, ethers, nitrobenzene, ketones, aldehydes and amines.

The following elevated contaminants were identified:

- Elevated petroleum hydrocarbons in the east of the site.
- Elevated TVOCs (inc. naphthalene) in made ground across the site.

It is likely that barrier pipe will be required across the site subject to the depth and location of the water pipes and in consultation with UU.

It should be noted typical pipework depths are 0.75mbgl to 1.35mbgl. The pipework will likely be laid into the underlying natural strata after levels have been reduced.

Once details of the pipeline location and depths are known a UU Risk Assessment should be undertaken.

At this stage, the probability of organic contaminants affecting potable water pipes is likely. Given the consequence is considered to be medium, the risk (pollutant linkage 6) is anticipated to be moderate risk and remediation (i.e. barrier pipe) is likely to be required (subject to further risk assessment).

5.5.3 Phytotoxicity (Pollutant Linkage 7)

Soil results were compared to phytotoxic guideline values as outlined in BS3882[68].

Elevated zinc (maximum concentration 350mg/kg) and copper (maximum concentration 480mg/kg) were identified. No evidence of vegetation stress was identified onsite and even though there were some exceedances of phytotoxic metals it is unlikely that specific remediation is required to remove this pollutant linkage, The

[66] BRE (2005). "Concrete in Aggressive Ground." Special Digest 1.
[67] UU(2011). "United Utilities Water Supplementary Guidance for the Selection of Water Pipes in Land Potentially Affected by Contamination."
[68] BS (2015). "Specifications for Topsoil and Requirements for Use." BS3882:2015.

probability of phytotoxic contaminants affecting vegetation is considered to be low. With a minor consequence, the risk (pollutant linkage 7) is anticipated to be very low.

In addition to the above, the characteristics of the made ground should also be taken into account if it is to be used as a topsoil / growing medium for flora. The material should be assessed against the parameters outlined in Table 1 of BS3882 (not included within this assessment). Made ground with undesirable material (e.g. glass, brick) was noted at shallow depth in localised areas of the site / across the site. Irrespective of the contamination risk, this material should not be used as topsoil.

5.6 Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-6) has been revised following the risk assessments undertaken in Sections 5.1-5.5. The revised contamination conceptual model follows the same methodology and guidance used in the preliminary contamination conceptual model. The risk matrix is provided in Appendix A.

The revised contamination conceptual model is presented in Table 5-7.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Further details of the remedial proposals and a remedial option appraisal are given in Section 6.

Please note further investigation is required in occupied area of the site once building have been demolished.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Assessment
PL1	– Dermal contact. – Inhalation of soil, fibres and dust. – Ingestion of soils, dust, vegetables, soil attached to vegetables. – Windblown dust.	– Current residents. – Future residents. – Site users. – Offsite receptors.	<u>Residential with Private Gardens</u> – Arsenic, lead, B(a)P.	Likely	Medium	**Moderate**	– Likely probability as elevated metals (arsenic and lead) and PAHs identified in the made ground which could come into contact with site users in gardens / soft landscaping areas. – **Recommendation**[*1]**:** Remediation required. Likely to include an environmental cover system in gardens where residential houses are present.
			<u>Residential with Private Gardens</u> -Heavy end HC -ACM chrysotile.	Low	Medium	Moderate / **Low**	– Low probability as limited heavy end hydrocarbons encountered and related to discrete cobble with bitumen coating and not representative of made ground matric. – ACM identified at Limits of Detection (LOD) as chrysotile in one location within landscaped areas. Visible pieces of ACM identified in a small number of locations. -Risk assessed as low. **-Recommendation**[*1]**:** Removal of the mound. Hand picking of visible ACM pieces. Environmental cover system as above for metals and PAHs will be sufficient in residential gardens.
			<u>Apartment Blocks, small verges (no gardens) and POS</u>	Unlikely	Medium	**Low**	– No elevations identified within proposed apartment block areas. – Localised elevations in POS area unlikely to pose a risk based on limited end use anticipated and nature of ground conditions. – **Recommendation:** Nominal 150mm topsoil layer in shared soft landscaping within apartment blocks and small verges. No specific remediation required in the POS area.
			<u>South East</u> Metals, PAHs, ACM (made ground) PCBs and transistor oils (electricity sub station)	Likely	Medium	**Moderate**	– Risk cannot be confirmed at this stage until investigation has taken place in southeast of site currently covered by occupied houses. – **Recommendation**: Intrusive investigation required once area has been demolished.
PL2	– Inhalation of vapours. – Migration through permeable strata and preferential pathways.	– Current residents. – Future residents. – Site users.	Volatile Contaminants: - Naphthalene	Unlikely	Medium	**Low**	– One elevated naphthalene results encountered, but marginal exceedance. – **Recommendation:** No remediation required.

Table 5-7: Revised Contamination Conceptual Model.

<u>Notes</u>

[*1] The conceptual model only takes into consideration the future use of the site and long-term exposure. Consideration should also be given to the short-term exposure of construction workers and nearby land users to ACM containing soils during groundworks. This is discussed further in Section 8.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Assessment
PL3	– Inhalation of gas. – Migration through permeable strata and preferential pathways. – Explosion in confined spaces (methane only).	– Current residents. – Future residents. – Buildings. – Offsite land users.	- Carbon dioxide (Area of Plot B)	Low Likelihood	Severe	**Moderate (Localised)**	– Elevated carbon dioxide identified (max. 16%v/v) in area of former infilled reservoir. Sufficient evidence to uprate the east of Plot B to CS2 from CS1. – **Recommendation:** Gas protection measures in line with CS2 required in the east of Plot B (see Figure 6).
			- Carbon Dioxide and methane (remainder of site)	Unlikely	Severe	Moderate / **Low**	– Remainder of site is within CS1 scenario and no evidence (e.g significant elevated gas concentrations or flow rates) to uprate the rest of the site to CS2. – Low risk assumed based on gas concentrations and flow rates being low to very low across most of the site. – **Recommendation:** No gas protection measures required.
PL4	– Surface Run-off. – Migration through permeable strata and preferential pathways – Perched waters migration.	– Groundwater (Secondary A Aquifer). – Surface water (Moss Brook (Culverted)).	Mobile contaminants: - Metals and PAHs.	Unlikely	Medium	**Low**	– Only elevated manganese recorded in groundwater samples when compared to relevant assessment criteria. – Very localised leachable hydrocarbon fractions relating to tarmacadam fragments in made ground. Not considered to pose a significant risk to wider groundwater. – Controlled waters sensitivity is considered to be low. – **Recommendation**: No remediation required.
PL5	– Sulphate attack on concrete.	– Building structure.	– Sulphate	Assessed in geotechnical report			– Elevated sulphate sporadic across the site. – **Recommendation**: Worst case sulphate resistant concrete to DC-2 AC-1s required.
PL6	– Ingestion of tainted water supply.	– Future site users (via potable water).	Organic Contaminants: – Naphthalene, hydrocarbons.	Likely	Medium	**Moderate**	– Likely probability as elevated organic contaminants encountered which could permeate water pipes and contaminate water supply. – **Recommendation:** UU risk assessment should be undertaken. Barrier piping likely to be required.
PL7	– Direct Contact (plant uptake).	– Flora.	Phytotoxic Contaminants: – Zinc, copper	Low	Minor	**Very Low**	– Elevated zinc and copper identified, which may be taken up by flora in soft landscaping / gardens. However, no evidence of vegetative stress identified. – **Recommendation:** No specific remediation required, but nominal clean cover will be sufficient.

Table 5-7 Continued: Revised Contamination Conceptual Model.

6 Waste Disposal Assessment

The soil contamination results as presented in Appendix C have been used to help determine the waste classification of material for off-site disposal.

As an initial screen the soil results were inputted into Hazwaste Online™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation[69, 70 ,71,72 ,73 ,74, 75, 76, 77].

Hazwaste Online™. has been designed to cover, amongst other waste types, the European Waste List of Waste (LoW) code number 17 "Construction and Demolition Waste (Including Excavated Soil from Contaminated Sites)".

Where less than limits of detection (LOD) were recorded, the value of the LOD was inputted.

Where applicable, appropriate metal species based on hazard statements/ molecular weight, site history, ground conditions and likely species present in soils were used (e.g. metal oxides relating to an ash based source).

The results show that the majority of the samples tested are classified as NON-HAZARDOUS WASTE and LoW code "17-05-04 - soil and stones other than those mentioned in 17 05 03" is suitable. The Hazwaste Online™ output sheets are provided in Appendix I.

However, 5 samples tested are classified as HAZARDOUS WASTE. The results for these samples are summarised in Table 6-1.

Sampling Location	LoW Code	Hazard (Risk Phrase)	Contaminants
WS5	17 05 03	HP8 (Corrosive)	pH
TP119	17-05-03	HP7 (Carcinogenic) HP11 (Mutagenic)	TPH (C6-40) petroleum group
TP117	17-05-03	HP7 (Carcinogenic) HP11 (Mutagenic)	TPH (C6-40) petroleum group
WS14B	17-05-03	HP7 (Carcinogenic) HP11 (Mutagenic)	TPH (C6-40) petroleum group

Table 6-1: Summary of Hazwaste Online ™ findings.

Based on individual locations hazardous waste has been identified. The soil in the east of the site, should be classified as HAZARDOUS WASTE based on carcinogenicity, mutagenicity, pH and LoW code "17-05-03 - soil and stones containing hazardous substances". This will be related to any tarmacadam fragments and cobble setts and therefore a bitumen source and not fuel. If these can be separated and re-tested along with any handpicking of visible ACM then the risk maybe reduced to non-hazardous waste. In addition, the mound may need further testing before disposal as LOD ACM was identified in one sample.

[69] EA (2018). "Guidance on the Classification and Assessment of Waste (1st Edition v1.1)". Technical Guidance WM3.
[70] CLP Regulation - Regulation 1272/2008/EC of 16 December 2008.
[71] 1st ATP - Regulation 790/2009/EC of 10 August 2009
[72] Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
[73] WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
[74] Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
[75] 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
[76] POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
[77] 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

6.1 Waste Acceptance Criteria (WAC) Testing

Waste Acceptance Criteria (WAC) testing was also undertaken on 9no. samples representative of material likely to be earmarked for off-site disposal. WAC test results are included in Appendix C.

The WAC limits cannot be used to make an assessment of whether a waste is hazardous. Landfills are classified according to whether they can accept hazardous or non-hazardous wastes. Wastes can only be accepted at a landfill if they meet the WAC for that class of landfill.

With regards to non-hazardous waste, material can only be designated to an inert cell of a non-hazardous landfill based on WAC testing. With regards to hazardous waste, material can only be designated as SNRH cell within a non-hazardous landfill or hazardous landfill from WAC testing.

The above potential designation if disposed to a licenced landfill are summarised in Table 6-2. It should be noted that the licenced landfill operator would determine the designation, which may differ to this assessment.

Sampling Location	Soil Designation (Haz-Waste)	Potential Landfill Designation			Designation
		Inert	SNRH	Haz.	
TP119/TP113	Hazardous	-	-	x	Hazardous landfill due to TOC, but SNRH if allow 2 x TOC.
TP110/TP108 0.1-1.1mbgl	Non-Hazardous	-	x	-	Non-hazardous but inert if allow 2x TOC and marginal fluoride exceedance.
TP101 0.0-1.0mbgl	Non-Hazardous	-	x	-	Non-hazardous but inert if allow 2x TOC.
TP104 0.70-1.30mbgl	Non-Hazardous		x		Non-hazardous but inert if allow 2x TOC.
TP105 1.10-2.1mbgl	Non-Hazardous	-	x	-	Non-hazardous but inert if allow 2x TOC.
TP115 0.20-1.20mbgl	Non-Hazardous	x	-	-	Inert
TP124 0.10-1.10mbgl	Non-Hazardous	x	-	-	Inert
TP128 0.50-0.9mbgl	Non-Hazardous	-	-	x	Hazardous landfill due to TOC.
TP131 0.40-1.0mbgl	Non-Hazardous		x		Non-hazardous but inert if allow 2x TOC.

Table 6-2: Summary of potential designations.

A number of WAC samples from the site fail the inert waste landfill criteria due to elevated TOC concentrations. Environment Agency[78] guidance includes a potential derogation to allow soils up to two times the TOC limits to be deposited at landfills for inert waste in certain circumstances.

Landfill operators wishing to pursue this approach will need to apply to vary their permit. The application must be waste-specific and must specify what limit of TOC is being applied for. It must include a risk assessment considering whether the landfill is designed such that it can cope with any gas and/or leachate that may be produced as a result of accepting this waste.

The producer will need to make a case for an increased TOC up to 2 x the WAC limit.

[78] EA 2010 "Waste Acceptance at Landfills" Guidance on Waste Acceptance Procedures and Criteria.

7 Conclusions

7.1 Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 7-1 below (more detailed model provided in Section 5).

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to site users future residents, site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and vegetables).	**Moderate** **Residential with private gardens**	– Moderate risk as elevated metals (arsenic and lead) and PAHs identified in the made ground which could come into contact with site users in gardens / soft landscaping areas. – **Recommendation:** Remediation required to include an environmental cover system in gardens where residential houses are present.
		Moderate / **Low** **Residential with private gardens**	– Low risk as limited heavy end hydrocarbons encountered and related to discrete cobble with bitumen coating and not representative of made ground matric. – ACM identified at Limits of Detection (LOD) as chrysotile in one location within landscaped areas. Visible pieces of ACM identified in a small number of locations. -Low risk assumed. – **Recommendation:** Removal of the mound. Hand picking of visible ACM pieces. Environmental cover system as above for metals and PAHs will be sufficient in residential gardens.
		Low **Apartment Block, small verges (no gardens) and POS**	– Low risk as no elevations identified within proposed apartment block areas. – Localised elevations in POS area unlikely to pose a risk based on limited end use anticipated and nature of ground conditions. – **Recommendation:** Nominal 150mm topsoil layer in shared soft landscaping within apartment blocks and small verges. No specific remediation required in the POS area.
		Moderate **SE occupied site**	– Moderate risk for heavy metals, PAHs and localised PCBs. Risk cannot be confirmed at this stage until investigation has taken place in southeast of site currently covered by occupied houses. – **Recommendation**: Intrusive investigation required once area has been demolished.
2	Volatile contaminants posing a risk to site users future site users via the inhalation of vapours.	**Low**	– No significantly elevated volatile contamination identified. **Recommendations:** No remediation required.
3	Gas posing a risk to buildings and site users buildings and site users via the migration of gas into building causing explosion and asphyxiation.	**Moderate** **East of Plot B**	– Elevated carbon dioxide identified (max. 16%v/v) in area of former infilled reservoir. Sufficient evidence to uprate the east of Plot B to CS2 from CS1. – **Recommendation:** Gas protection measures in line with CS2 required in the east of Plot B (see Figure 6).
		Moderate / **Low** **Remainder of occupied site**	– Remainder of site is within CS1 scenario and no evidence (e.g significant elevated gas concentrations or flow rates) to uprate the rest of the site to CS2. – Low risk assumed based on gas concentrations and flow rates being low to very low across most of the site. – **Recommendation:** No gas protection measures required

Table 7-1: Summary Risk Table.

Pollutant Linkage		Risk	Recommendations
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	**Low**	- Only elevated manganese recorded in groundwater samples when compared to relevant assessment criteria. - Very localised leachable hydrocarbon fractions relating to tarmacadam fragments in made ground. Not considered to pose a significant risk to wider groundwater. - **Recommendation**: No remediation required.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	-Assessed in geotechnical report. Elevated sulphate sporadic across the site. **-Recommendation**: Worst case sulphate resistant concrete to DC-2 AC-1s required.	
6	Organic contaminants posing a risk to water pipes.	**Moderate**	- Organic contamination identified at potable pipe depth of 0.75-1.35mbgl. - **Recommendations:** UU risk assessment to be completed. The site will likely require barrier piping.
7	Phytotoxic metals posing a risk to flora via root uptake.	**Very Low**	- Elevated contaminants identified, but no vegetative stress. - **Recommendations:** No specific remediation required, but nominal clean cover will be sufficient.

Table 7-1 Continued: Summary Risk Table.

Waste Classification

The majority of the made ground onsite is characterised as Non-Hazardous waste only if ACM is not visible. The exception is soil in the east of the site which could be classed as Hazardous waste. This will be related to any tarmacadam fragments and cobble setts. If these can be separated and re-tested along with any handpicking of visible ACM then the risk maybe reduced to non-hazardous waste. In addition, the mound may need further testing before disposal as LOD ACM was identified in one sample.

Remedial recommendations are presented in Section 8.

Soakaways

Soakaways failed in the clay onsite. Therefore, due to underlying clay and deep made ground soakaways are unlikely to feasible for this site.

8 Recommendations and Remedial Strategy

The recommendations provided below are considered appropriate for the site based on the site investigation work undertaken to date. LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

8.1 Remediation and Validation Recommendations

Table 8-1 details the further works and remedial recommendations / requirements. The table shows work required post-demolition of building(s), pre-construction (i.e. during earthworks) and during / post construction.

Table 8-2 provides information on considerations during and after construction.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	All	Post-demolition Trial Pitting in SE This is recommended to confirm ground conditions below the current buildings and allow delineation of areas of concern. This should allow a more targeted remediation strategy to be completed. This work will also provide more geotechnical information for foundation design.	N/A (Investigation Report will be provided with an updated Remediation Strategy).
		The bunded material will need further testing before disposal in relation to LOD ACM identified in one sample (assumed disposal as site is to be reduced in levels). Appropriate asbestos management will be required by the Remediation Contractor before work commences.	Report results and provide disposal tickets as part of wider earthwork removal offsite.
	ALL	Earthworks Inspections / Unexpected Contamination The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required. Material should be stockpiled and quarantined on visqueen and covered.	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
On / Post--Construction	3	Gas Protection Measures required in Localised Areas (East of Plot B – see Figure 6) In line with CS2 as per UK guidance[79,80]. This is likely to / should include: • Passive subfloor or active subfloor ventilation system. • Methane and carbon dioxide resistant membrane installed as per manufacturer's instructions. • Ventilation of confined spaces within the building. • Well-constructed reinforced suspended, raft or cast in situ ground slab. • Minimum penetration of ground slab by services. • All joints and penetrations to be sealed. Depending on the type of building and foundation design the protection measures can vary. The gas protection measures will be detailed and approved with the Local Authority once the foundation design has been confirmed.	Supply and review of foundation designs. Photographic evidence of sub-floor void, ventilation and suitably sealed gas membrane. Validation of gas protection measures should be in line with CIRIA 735[81]

Table 8-1: Remediation and validation requirements
Note: PL = Pollutant Linkage

[79] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665
[80] BSI (2015). "Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for new buildings." BS8485:2015.
[81] CIRIA (2014). "Good Practice on the Testing and Verification of Protection Systems for Building Against Hazardous Ground Gas". CIRIA C735.

Phase	PL	Remediation Requirements	Validation Requirements
On / Post--Construction	1 and 7	Environmental Cover System (Residential with garden areas only- see Figure 6) As made ground is relatively deep, it is unlikely to be viable to remove the contaminated soils. Therefore, an environmental cover system is recommended. The environmental cover system should be as follows: **Private Back Gardens:** **600mm thick environmental cover system comprising:** **Either** 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 500mm comprising clean inert fill and sufficient topsoil for a growing medium. **Or** geotextile membrane and at least 600mm comprising clean inert fill and sufficient topsoil for a growing medium. **Private Front Gardens:** **450mm thick environmental cover system comprising:** **Either** 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 350mm comprising clean inert fill and sufficient topsoil for a growing medium. **Or** geotextile membrane and at least 300mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. **Landscaping Around Apartment Blocks, small verges around duplex buildings and POS.** Topsoil Growing Medium Although no contamination were at levels or in a matrix that could significantly harm key receptors in areas of landscaping around the apartment blocks, POS and small verges around the duplex buildings, the existing made ground is not expected to be a suitable growing medium given the nature of the soil and the undesirable material present (ash and brick). A minimal topsoil cover of approximately 150mm is recommended	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 8-2.
	5	Sulphate Resistant Concrete Sulphate Resistant Concrete in line with DS-2 AC-1s may be required in localised areas.	N/A
	6	Potable Water Pipes It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material or Photographs of the Installed Pipe.

Table 8-1 (continued): Further work, remediation and validation requirements
Notes: See Table 5-7 for pollutant linkage (PL) details.

Other Considerations
Grubbing Out of In-Ground Structures It is recommended that in-ground structures are grubbed out as part of the groundworks
Re-use of site won material (LKC understand site levels will be reduced so may not be required) To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used): 5,000 tonnes (*c.* 2,500m^3) treatment of crushed concrete / stone. 1,000 tonnes (*c.* 500^3) use of non-hazardous soil 5,000 tonnes (*c.* 2,500m^3) use of clays, sand, gravel, brick, concrete, stone etc. 50,000 tonnes (*c.* 25,000m^3) use of bitumous material to be used in roadways. A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered **before** material movement starts onsite. If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'. For all the above material will need to be tested at the rate and analytical suites presented in Table 8-3.
Asbestos Management Plan Due to the presence of asbestos containing material (1/54 in soil and 3no. visible pieces), it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations. This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, such as wetting techniques and it is recommended that an appropriate 'Asbestos Management Strategy' is developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733. This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring. With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012). If ACM is identified in soil arisings then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable (if present) and must be removed by a licenced contractor. Given that visible pieces of ACM were identified in TP104, TP18 and TP112, it is recommended that hand picking of the ACM is undertaken in these areas. The ACM should be doubled bagged and disposed of accordingly. The JIWG model (presented in Appendix J) identified this work to be classed as **Non-Licensed Work (basic RPE and localised dust suppression)** for the identified pieces of chrysotile cement and board. The soil ACM at LOD was considered a negligible risk, where CAR did not apply.

Table 8-2: Further considerations.

Other Considerations
Health and Safety Considerations In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance[85]) should be adopted by all workers involved with site enabling and construction works.
Piling in Contaminated Land It is understood that the building will be piled. This may provide a preferential pathway for contaminants to the Secondary B Aquifer. Once the method of piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency.
Asbestos Survey (areas of occupied residential housing) A Pre-Demolition and Major Refurbishment Asbestos Survey should be undertaken, and any ACMs removed and properly disposed of, prior to the demolition of the existing buildings, by a suitably qualified professional.

Table 8-2 (continued): Further considerations.

8.2 Validation of Subsoil / Topsoil

Chemical validation of all imported soils to be used on site in gardens and soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

A summary of the required imported material sampling requirements is presented in Table 8-3, based on MCC 'Guidelines to Developer' (2016). LKC however consider no testing, but proof of provenance for natural virgin quarried material.

Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. However, where this is not possible then material imported should be segregated based on source and soil type. Validation samples should be taken prior to placement in gardens / soft landscaping to ensure suitability for use.

Material Type	Source	Suite of Analysis	Sampling Rate (min. 3 per source) *		
			Garden	Landscape	Other **
Topsoil / subsoil / Fill material	Greenfield	Suite A	200m^3	200m^3	200m^3
	Remediated	Suite A / B dependent upon original SI	100m^3	150m^3	200m^3
	Brownfield / Unknown	Suite B	50m^3	150m^3	200m^3
Quarried Fill	First Generation i.e. quarried sand (subsoil) or stone (break layer)	No testing is required. Certification of material provenance is required.			

Table 8-3: Sampling requirements for imported soils.

Notes:

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

** Other assumed to be stone / 6F2 etc.

Any soil with visual or olfactory evidence of hydrocarbons should be rejected.

[85] HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882[86]). LKC advise this information is provided by the supplier before material is imported onto site.

Imported material to be used in gardens will be compared against residential with plant uptake criteria (as used in the contamination risk assessment (Section 5-1). Appropriate remedial target criteria are presented in Appendix G.

8.3 Site Completion Report

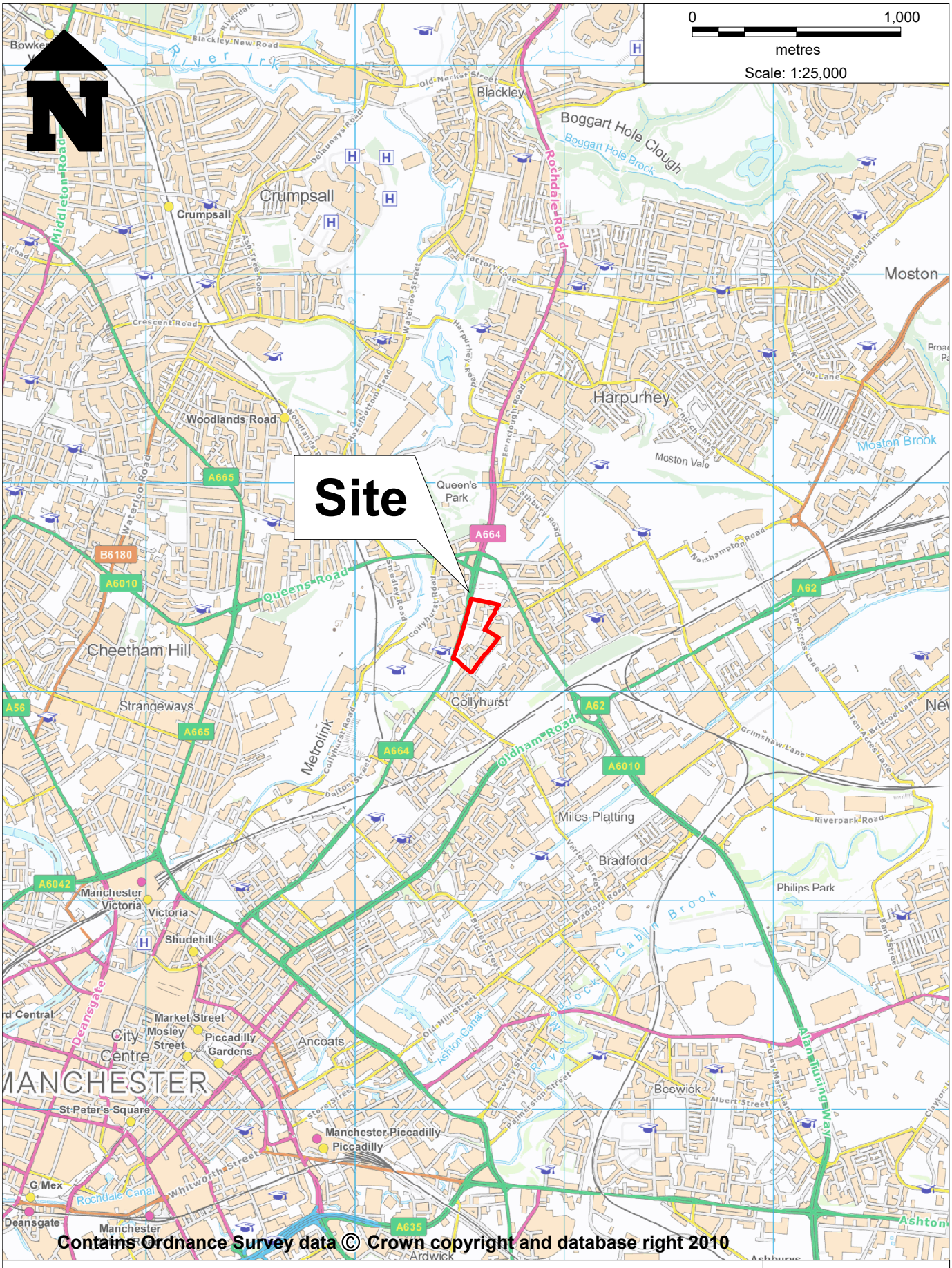
It is recommended that any remediation carried out on the site is validated by a third party and suitable documentary evidence provided in a Site Completion Report, such as photographs, consignment documents and analytical results. This should include as a minimum:

- Further site investigation and risk assessment within the area of the occupied houses, when demolished.
- Validation of gas protection measures installed or assessment of the gas risk after monitoring.
- Provision of waste transfer documents.
- Environmental capping layer: Validation of environmental cover system.
- Verification testing of all imported soil for garden and soft landscaping areas.
- Information on the installation of protective pipes and / or sterile trenches.
- Details of any unexpected contamination identified onsite, suitably risk assessed and / or validated.

The Site Completion Report will assist the Local Authority in the discharge of any future relevant planning condition and will also be of use to solicitors acting on behalf of any prospective conveyancer who may have concerns over the former use of the site.

[86] BS (2015). "Specifications for Topsoil and Requirements for use." BS3882:2015.

Figures

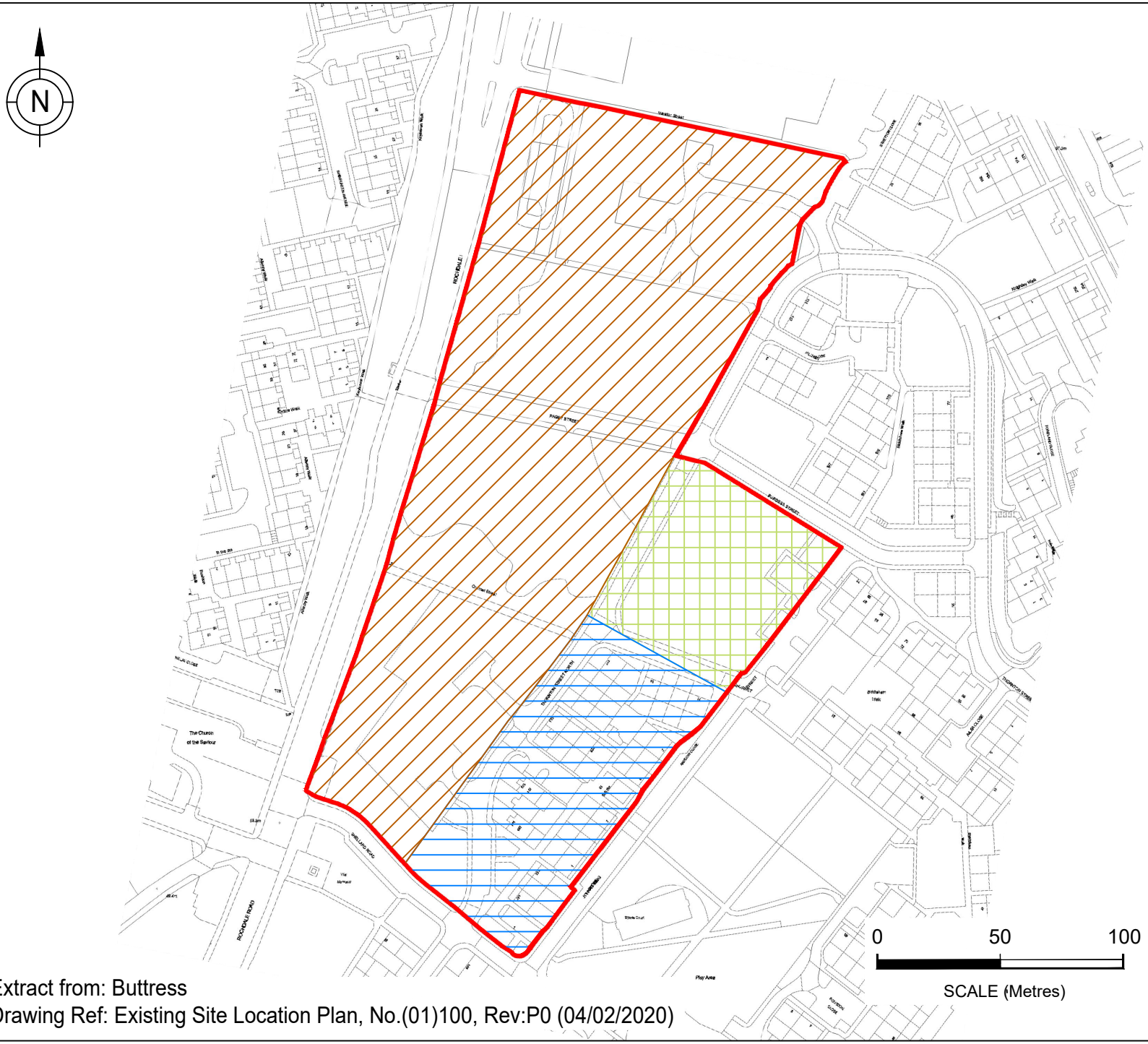


Contains Ordnance Survey data © Crown copyright and database right 2010

Figure 1: Site Location Plan, Collyhurst Village, Manchester

Drawn: August 2020 Scale: 1:25,000 @ A4 (see scale bar)

LK CONSULT LIMITED



KEY

- Planning Boundary
- Current Development Area
- Public Open Space
- To be Developed in Future Once Unoccupied

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

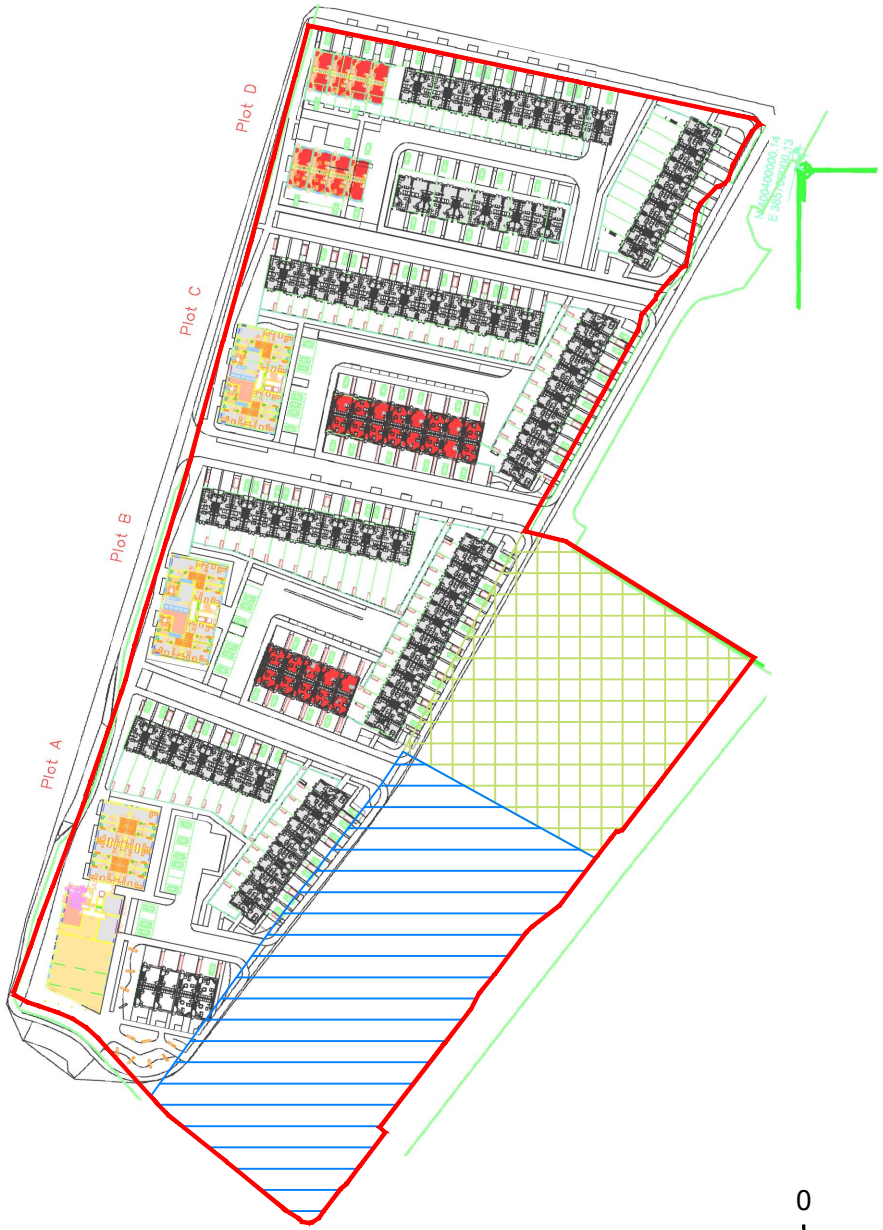
LK CONSULT LIMITED

Client:	Civic Engineers
Site:	Collyhurst Village, Manchester
Title:	Site Boundary Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	2	

Drawn By:	Checked By:	Drawn:
AC	CH	Oct 2020

Extract from: Buttress
Drawing Ref: Existing Site Location Plan, No.(01)100, Rev:P0 (04/02/2020)



0 50 100

SCALE (Metres)

KEY

- Site Boundary
- Public Open Space
- To be Developed in Future Once Unoccupied

Housetypes:

2B3P – Apt	20
2B4P – Apt	17
2B4P – Duplex	24
2B4P – TH	50
3B4P – Apt	2
3B5P – Duplex	6
3B5P – Apt	15
3B5P – TH	88
3B6P – Duplex	0
3B6P – Apt	0
4B6P – TH	18
	240

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LK CONSULT LIMITED

Client: Civic Engineers

Site: Collyhurst Village, Manchester

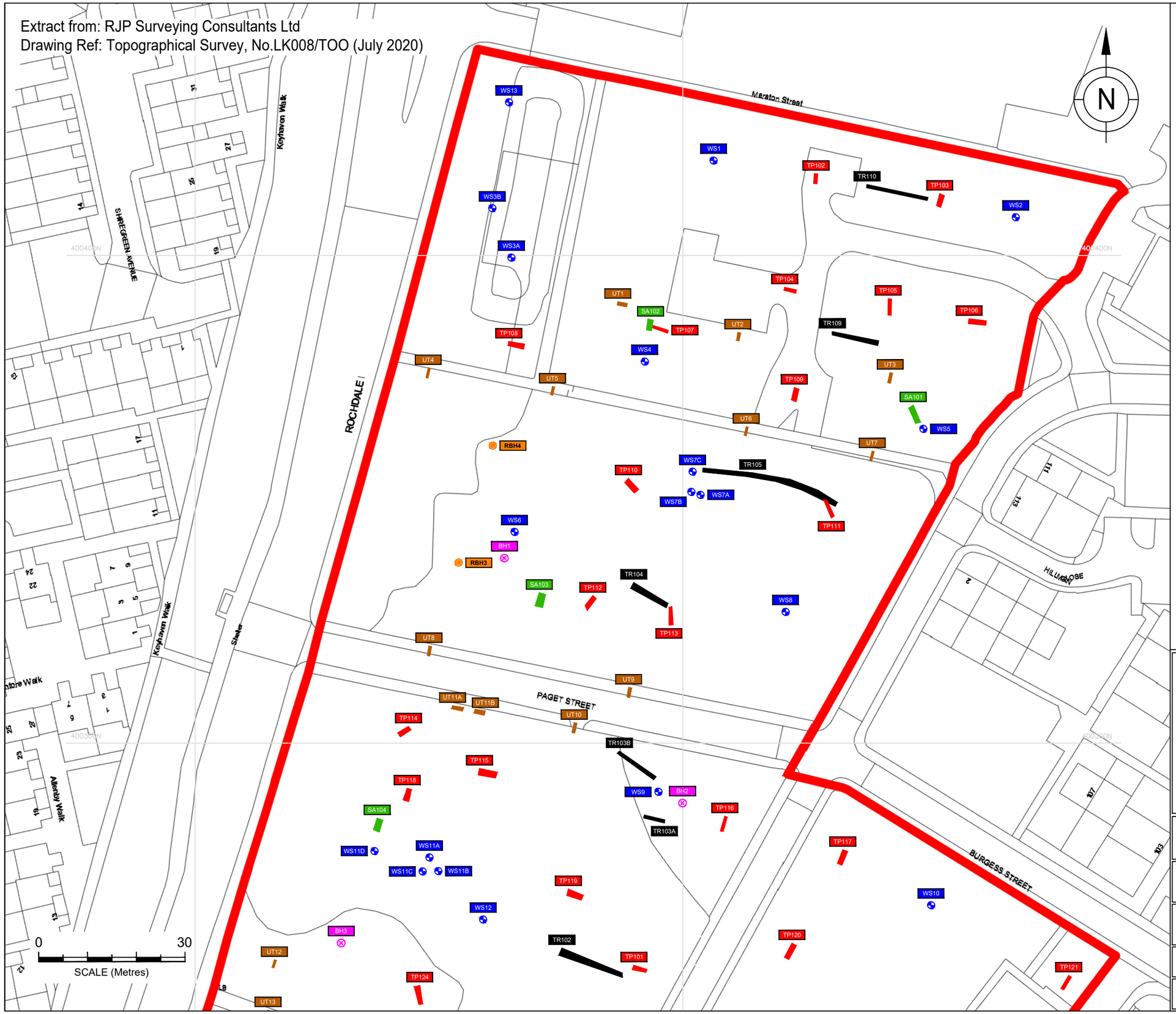
Title: Proposed Development Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	3	

Drawn By:	Checked By:	Drawn:
AC	HM	Aug 2020

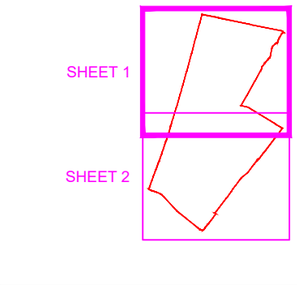
Extract from: Buttress
Drawing Ref: Collyhurst Village Housetype Plan (19/08/2020)

Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)



KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)



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LK CONSULT LIMITED

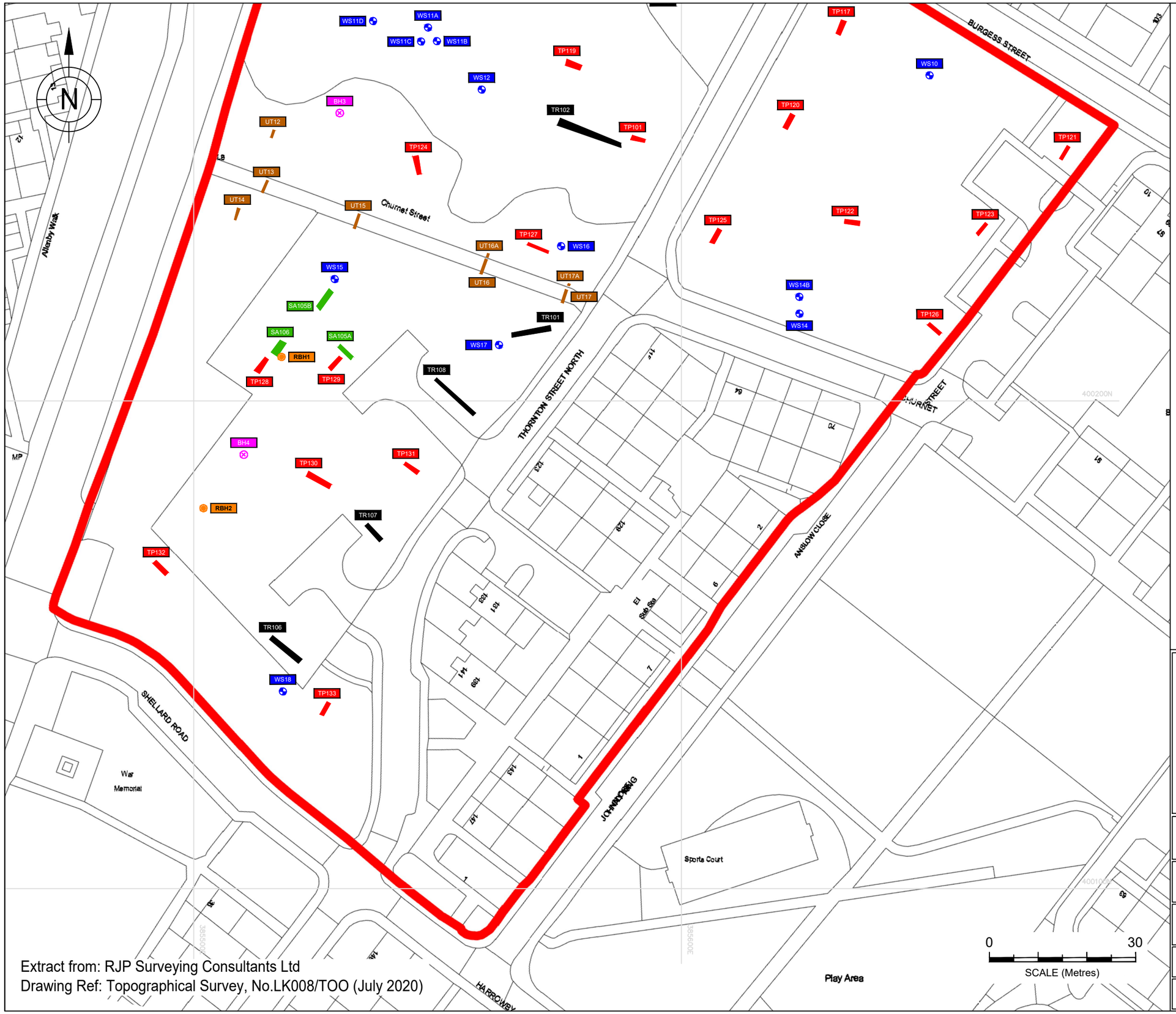
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Site Investigation Location Plan (Sheet 1)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	4	

Drawn By:	Checked By:	Drawn:
AC	HM	Aug 2020



Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)

KEY

- Site Boundary
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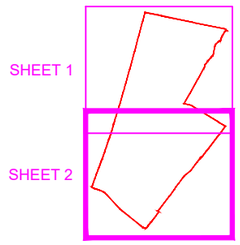

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LK CONSULT LIMITED

Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Site Investigation Location Plan (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	4	

Drawn By:	Checked By:	Drawn:
AC	HM	Aug 2020

Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)

Public Open Space
(number in box = GAC)

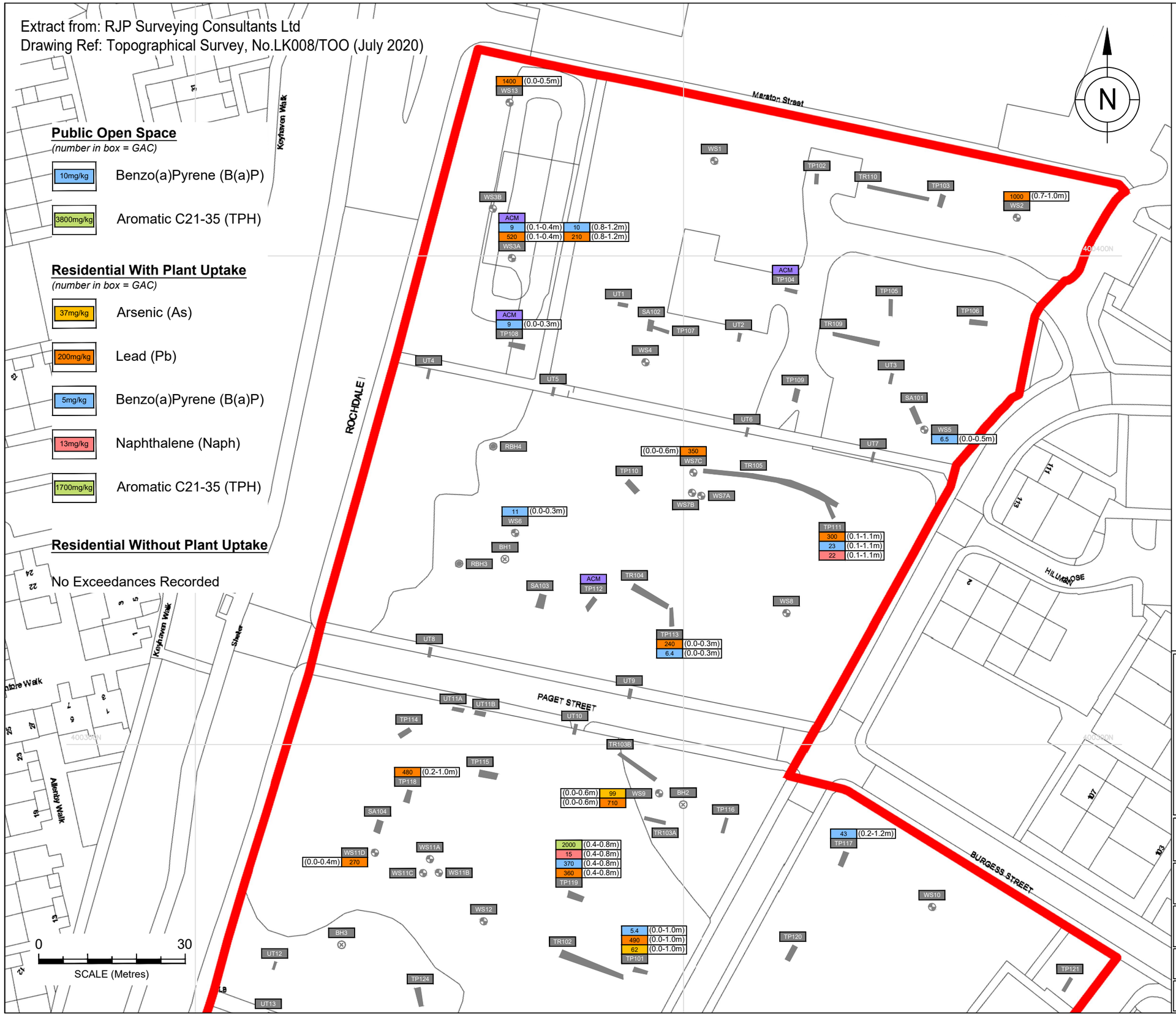
- 10mg/kg — Benzo(a)Pyrene (B(a)P)
- 3800mg/kg — Aromatic C21-35 (TPH)

Residential With Plant Uptake
(number in box = GAC)

- 37mg/kg — Arsenic (As)
- 200mg/kg — Lead (Pb)
- 5mg/kg — Benzo(a)Pyrene (B(a)P)
- 13mg/kg — Naphthalene (Naph)
- 1700mg/kg — Aromatic C21-35 (TPH)

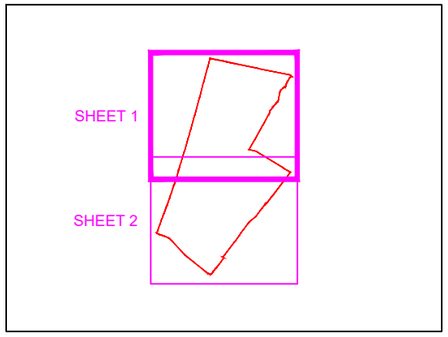
Residential Without Plant Uptake

No Exceedances Recorded



KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)
- ACM — Asbestos-Containing Material (ACM)



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LK CONSULT LIMITED

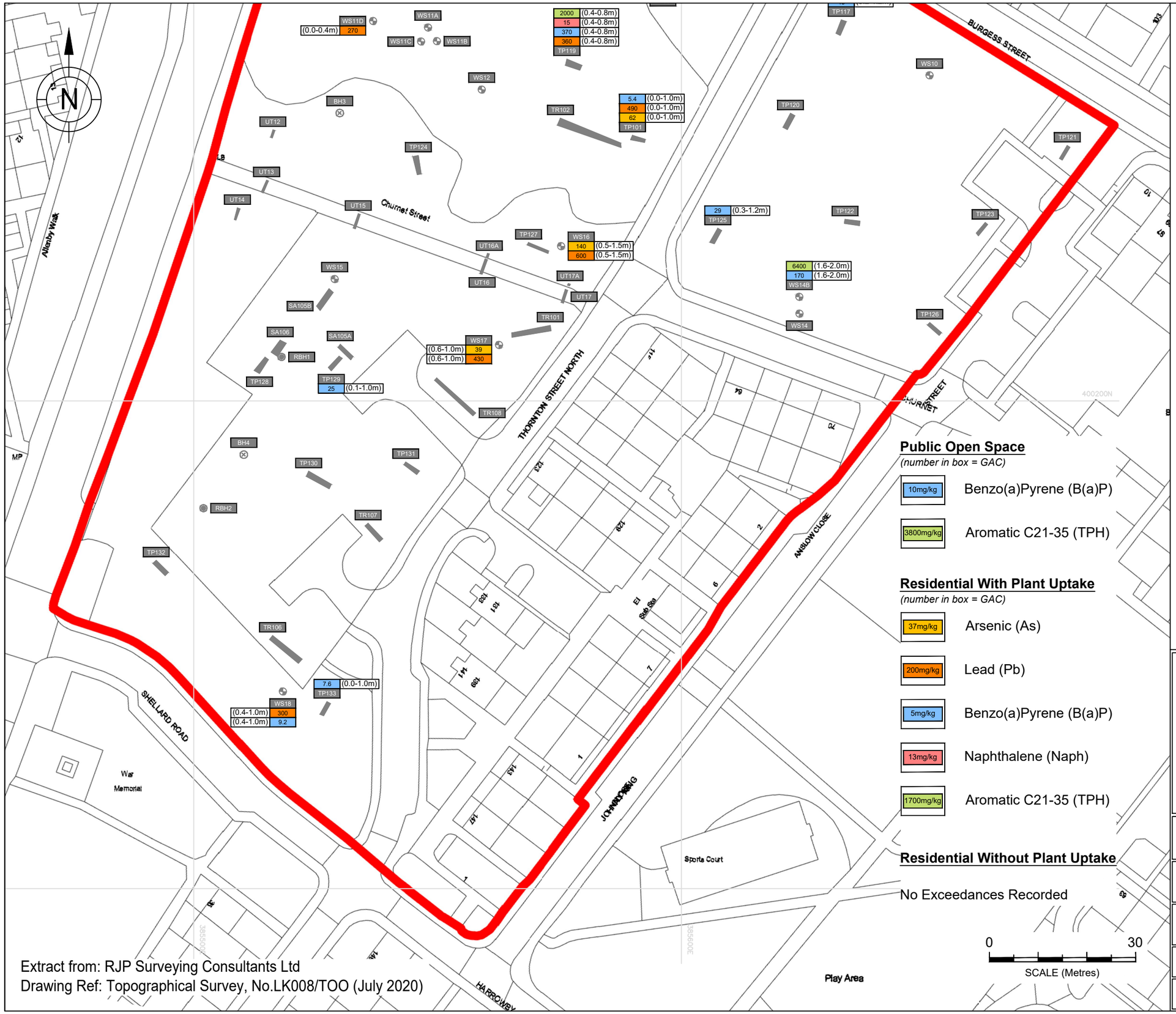
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Elevated Contaminants Plan (Sheet 1)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	5	

Drawn By:	Checked By:	Drawn:
AC	CH	Oct 2020



Public Open Space

(number in box = GAC)

10mg/kg	Benzo(a)Pyrene (B(a)P)
3800mg/kg	Aromatic C21-35 (TPH)

Residential With Plant Uptake

(number in box = GAC)

37mg/kg	Arsenic (As)
200mg/kg	Lead (Pb)
5mg/kg	Benzo(a)Pyrene (B(a)P)
13mg/kg	Naphthalene (Naph)
1700mg/kg	Aromatic C21-35 (TPH)

Residential Without Plant Uptake

No Exceedances Recorded

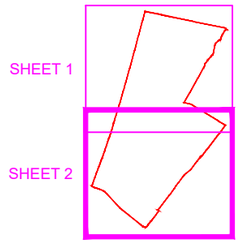
0 30

SCALE (Metres)

Extract from: RJP Surveying Consultants Ltd
Drawing Ref: Topographical Survey, No.LK008/TOO (July 2020)

KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)
- ACM — Asbestos-Containing Material (ACM)



Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

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Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Elevated Contaminants Plan (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	5	

Drawn By:	Checked By:	Drawn:
AC	CH	Oct 2020

Extract from: Buttress
Drawing Ref: Collyhurst Village Housetype Plan (19/08/2020)

Remediation Zones

- Cover System Required (450mm Front Gardens, 600mm Rear Gardens)
- Characteristic Situation 2 (CS2) Gas Protection Measures Required
- Site Investigation Required (Occupied)

NOTE:

Nominal 150mm topsoil cover required in any soft landscaping in areas not requiring cover system.

0 30
SCALE (Metres)

KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)

SHEET 1
SHEET 2

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

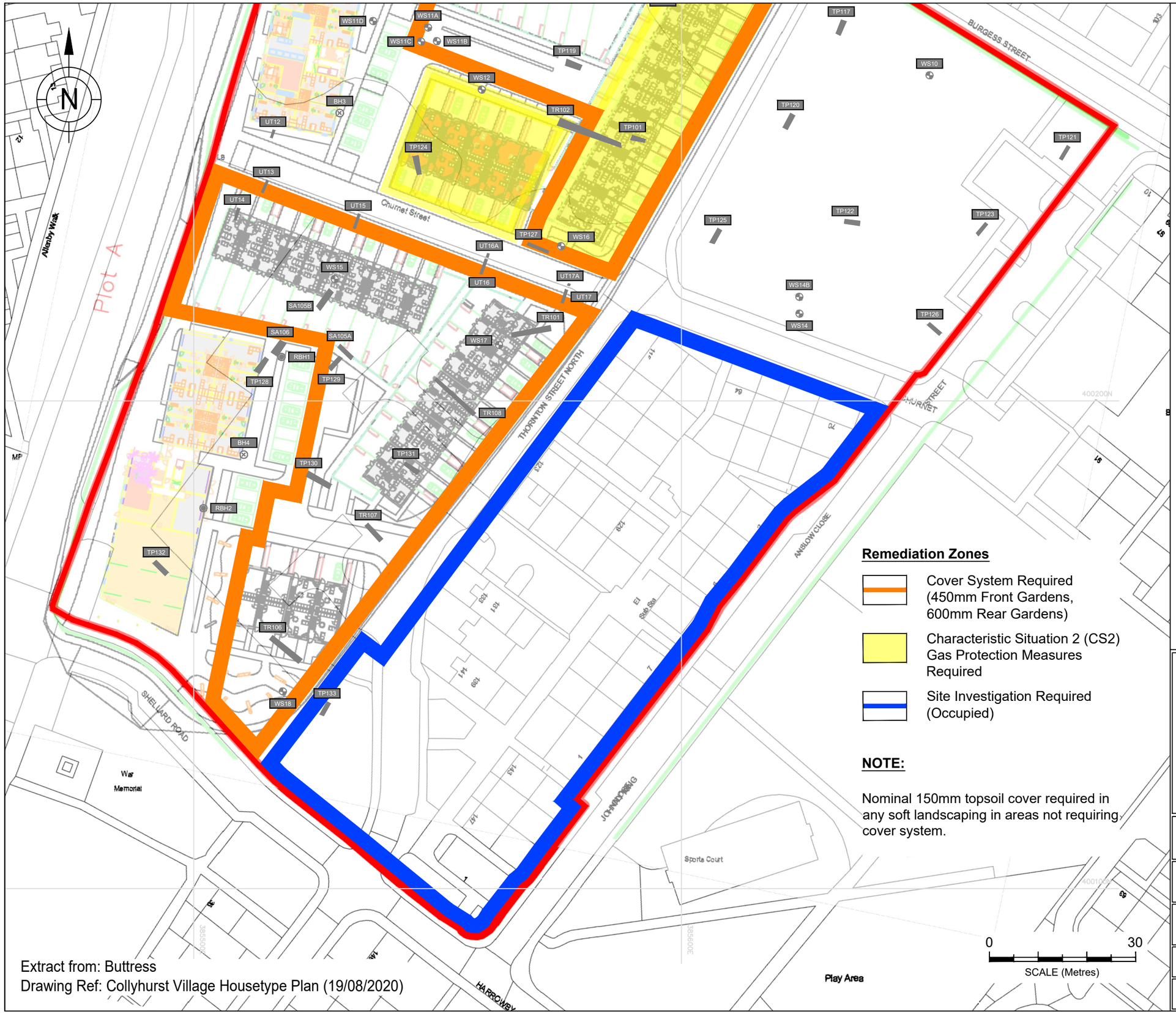
Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Remediation Zoning Plan (Sheet 1)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	6	

Drawn By:	Checked By:	Drawn:
AC	HM	Oct 2020



Remediation Zones

- Cover System Required (450mm Front Gardens, 600mm Rear Gardens)
- Characteristic Situation 2 (CS2) Gas Protection Measures Required
- Site Investigation Required (Occupied)

NOTE:

Nominal 150mm topsoil cover required in any soft landscaping in areas not requiring cover system.

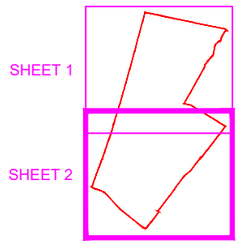
0 30

SCALE (Metres)

Extract from: Buttress
Drawing Ref: Collyhurst Village Housetype Plan (19/08/2020)

KEY

- Site Boundary
- Cable Percussive Borehole (BH)
- Trial Pit with Soakaway Testing (SA)
- Trial Pit (TP)
- Trial Trench (TR)
- Utility Trench (UT)
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)



Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

Client: Civic Engineers

Site: Collyhurst Village, Manchester

Title: Remediation Zoning Plan (Sheet 2)

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1120	See Scale Bar	6	

Drawn By:	Checked By:	Drawn:
AC	HM	Oct 2020

Appendix A

Risk Matrix

Risk Evaluation

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552[87]. It involves the classification of the:

- Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- Magnitude if the probability (likelihood) of the risk occurring (Table B).

Consequence (Severity)		
Classification	**Definition**	**Example**
Severe	- Short term (acute) risk to human health likely to results in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. - Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. - Catastrophic damage to buildings/properties. - A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	- High Concentrations of cyanide on the surface of an informal recreation area. - Major spillage of contaminants from site into controlled waters. - Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied).
Medium	- Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). - Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution). - A significant change in a particular ecosystem, or organism forming part of such ecosystem.	- Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria. - Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary). - Death of a species within a designated nature reserve.
Mild	- Pollution of non-sensitive water resources. - Significant damage to crops, buildings, structures and services ('significant harm' as defined in DETR, 2000). - Damage to sensitive buildings/structures/services or the environment.	- Pollution of non-classified groundwater. - Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	- Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. - Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). - Easily repairable damage to buildings, structures and services.	- The presence of contaminants at such concentrations that protective equipment is required during site works. - The loss of plants in a landscaping scheme. - Discoloration of concrete.

Table A. Classification of Consequence

Probability (Likelihood)	
Classification	**Definition**
High Likelihood	- There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	- There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. - Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	- There is a pollutant linkage and circumstances are possible under which an event could occur. - However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	- There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term.

Table B. Classification of Probability.

[87] CIRIA C552 (2001) Contaminated Land Risk Assessment - A Guide to Good Practice.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table C. Comparison of Consequence against Probability

Once the risk has been determined the corresponding action can be assessed (Table D).

Risk	Action Required
Very High Risk	- There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that sever harm to a designated receptor is currently happening. - This risk, if realised, is likely to results in a substantial liability. - Urgent investigation (if not already undertaken) and remediation are likely to be required.
High Risk	- Harm is likely to arise to a designated receptor from an identified hazard. - Realisation of the risk is likely to present a substantial liability. - Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	- It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. - Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	- It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	- There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table D. Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Appendix B

Profile Logs

LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **RBH1**
Machine : Beretta T41 **Flush :** Mist **Core Dia :** 92 mm **Method :** Rotary Cored	**Casing Diameter** 125mm cased to 3.00m **Location**	**Ground Level (mOD)** **Dates** 17/08/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(3.00)	MADE GROUND: Dark brown clayey gravelly SAND with occasional brick and stone.		
							3.00 (1.45)	Weathered SANDSTONE.		
4.50							4.45 (0.31) 4.76 (0.46) 5.22 (0.14) 5.36 (0.14) 5.50 (0.26) 5.76	NO RECOVERY. Medium strong thinly bedded red and orange fine to medium SANDSTONE with occasional rounded red mudstone clasts. Slightly weathered. Dip 20degrees. Fractures very closely spaced planar smooth clean. Residual weathered MUDSTONE recovered as firm consistency red CLAY. Very weak thinly laminated grey SILTSTONE. Partially weathered. Dip 20degrees. Fractures very closely spaced planar smooth clean bedding parallel, likely drilling induced.		
	82	74	48	Av:50 Min:NI Max:450			(1.12)	NO RECOVERY. Very weak thinly laminated red MUDSTONE. Destructured to 6.00mbgl. Distinctly weathered below 6.00mbgl. Dip 20degrees. Fractures closely to medium spaced stepped rough clean bedding parallel, possibly drilling induced.		
7.50							6.88 (0.12) 7.00 (0.50)	Very weak thinly laminated black MUDSTONE to SHALE. Partially weathered becoming reddish grey in bands with depth. Dip 20degrees. Fractures closely to medium spaced stepped rough clean bedding parallel, possibly drilling induced. Weak thinly laminated grey SILTSTONE. Distinctly weathered to 7.30mbgl. Partially weathered below 7.30mbgl. Dip 20degrees. Fractures very closely spaced stepped rough clean, majority bedding parallel. Subvertical stepped rough clean fracture from		

Remarks	**Scale (approx)**	**Logged By**
	1:40	PW
	Figure No.	
	LKC 20 1120.RBH1	

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **RBH1**
Machine : Beretta T41 **Flush :** Mist **Core Dia :** 92 mm **Method :** Rotary Cored	**Casing Diameter** 125mm cased to 3.00m **Location**	**Ground Level (mOD)** **Dates** 17/08/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							7.50	7.20-7.50mbgl.		
							8.00	NO RECOVERY.		
	82	75	46	Av:10 Min:10 Max:360			(2.50)	Very weak thinly laminated reddish grey SILTSTONE. Slightly weathered. Dip 20degrees. Fractures medium spaced planar smooth clean, rare closed with slight red discolouration, bedding parallel. Subvertical undulating smooth clean fracture from 8.50-9.00mbgl. Subvertical stepped striated iron stained fracture from 9.90-10.30mbgl. Very thinly interbedded light grey fine SANDSTONE lenses present from 10.00-10.20mbgl.		
10.50							10.50	NO RECOVERY.		
	69	66	40	Av:80 Min:NI Max:380			(0.60) 11.10 (2.40)	Very weak thinly laminated reddish grey SILTSTONE. Slightly weathered. Dip 20degrees. Fractures closely spaced planar smooth clean bedding parallel. Subvertical undulating closed fracture from 11.90-12.10mbgl. Very thinly interbedded light grey fine SANDSTONE lenses present from 12.30-13.10mbgl. Subvertical undulating rough iron stained fracture from 12.30-12.80mbgl. Highly weathered 12.50-12.75mbgl.		
13.50							13.50	Completely weathered 13.40-13.50mbgl.		
							(0.60)	NO RECOVERY.		
	79	78	35	Av:80 Min:NI Max:320			14.10 (0.70)	Weak thinly laminated reddish grey MUDSTONE. Partially weathered. Dip 20degrees. Fractures closely spaced stepped smooth clean bedding parallel. One of the stepped smooth clean bedding parallel fractures shows polished clay and slicken lines.		
15.00							14.80 (0.70)	Weak thinly laminated black MUDSTONE to SHALE. Partially weathered. Dip 20degrees. Fractures medium to closely spaced planar smooth clean bedding parallel, potentially drilling induced. Subvertical stepped closed fracture from 14.90-15.40mbgl.		
							15.50 (0.50)	Complete at 15.50m		

Remarks

Scale (approx)	Logged By
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Figure No.
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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 92 mm **Method :** Rotary Cored	**Casing Diameter** 125mm cased to 13.50m **Location**	**Ground Level (mOD)** **Dates** 18/08/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(3.00)	MADE GROUND: Dark brown clayey gravelly SAND with occasional brick and stone.		
							3.00	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with occasional pottery, bones and timber.		
							(8.50)			

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
LKC 20 1120.RBH2

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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 92 mm **Method :** Rotary Cored	**Casing Diameter** 125mm cased to 13.50m **Location**	**Ground Level (mOD)** **Dates** 18/08/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							11.50	MADE GROUND: Bricks and stone with some ash.		
							(2.00)			
13.50							13.50	Medium strong thinly bedded red fine to medium SANDSTONE with occasional mica. Fresh. Dip 15-25degrees. Fractures closely to medium spaced planar smooth clean bedding parallel.		
							(1.30)			
							14.80	30mm thick deep red band at base of the strata.		
	79	78	70	Av:140 Min:10 Max:260			(0.98)	Medium strong thinly bedded pale buff fine to medium SANDSTONE with occasional mica. Fresh. Dip 15-25degrees. Fractures closely to medium spaced planar smooth clean bedding parallel. Distinctly weathered 15.28-15.35mbgl.		
							15.78	Weak thinly laminated reddish grey MUDSTONE. Unweathered. Dip 20degrees. Fractures closely spaced		

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
LKC 20 1120.RBH2

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **RBH2**
Machine : Beretta T41 **Flush :** Mist **Core Dia :** 92 mm **Method :** Rotary Cored	**Casing Diameter** 125mm cased to 13.50m **Location**	**Ground Level (mOD)** **Dates** 18/08/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.32)	planar smooth bedding parallel.		
							16.10 (0.13)			
							16.23 (0.27)	Weak thinly laminated grey SILTSTONE with occasional iron inclusions. Slightly weathered. Dip 20degrees. Fractures closely spaced planar smooth clean bedding parallel.		
16.50	74	42	32	Av:NI	Min:NI,Max:180		16.50 (0.50)	Very weak thinly laminated reddish grey MUDSTONE. Distinctly weathered. Dip 20degrees. Fractures extremely to very closely spaced planar smooth clean with rare clay infill bedding parallel.		
17.00							17.00	Medium strength thinly laminated light and dark grey interbedded SILTSTONE. Slightly weathered. Dip 15degrees. Fractures closely spaced planar smooth clean bedding parallel. Subvertical stepped rough clean fracture from 16.80-17.00mbgl.		
	100	92	32	Av:80 Min:NI Max:190			(3.00)	Medium strength thinly laminated reddish grey SILTSTONE. Slightly weathered. Dip 20degrees. Fractures closely spaced planar smooth to undulating smooth clean 20-45degrees. Very thinly interbedded light grey fine SANDSTONE lenses present from 19.00-19.35mbgl.		
20.00							20.00	Complete at 20.00m		

Remarks

Scale (approx)	Logged By
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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Borehole Number** **RBH3**
Machine : Beretta T41 **Flush :** Mist **Core Dia :** 84 mm **Method :**	**Casing Diameter** 125mm cased to 14.00m **Location**	**Ground Level (mOD)** **Dates** 01/09/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.15) 0.15	MADE GROUND: Brown silty gravelly SAND with occasional rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
								Light brown CLAY with frequent sand and gravel bands.		
							(13.85)			

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
LKC 20 1120.RBH3

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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 84 mm **Method :**	**Casing Diameter** 125mm cased to 14.00m **Location**	**Ground Level (mOD)** **Dates** 01/09/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
14.00							14.00	NO RECOVERY.		
	36	26	6	Av:30 Min:NI Max:190			(1.90) 15.90	Weak to medium strong thinly to thickly laminated dark red		

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 84 mm **Method :**	**Casing Diameter** 125mm cased to 14.00m **Location**	**Ground Level (mOD)** **Dates** 01/09/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.10)	fine SANDSTONE with occasional mica. Slightly weathered. Dip 20degrees. Fractures very closely spaced planar smooth clean bedding parallel, possibly drilling induced. Subvertical fracture planar rough iron stained from 15.90-16.60mbgl.		
17.00							17.00			
							(0.80)	NO RECOVERY.		
	46.6	23.3	0	Av:10 Min:NI Max:80			17.80			
							(0.70)	Weak thinly laminated black shaley MUDSTONE. Partially weathered. Dip 20degrees. Fractures very closely planar smooth clean bedding parallel, possibly drilling induced. Distinctly weathered 18.00-18.15mbgl.		
18.50							18.50			
							(0.50)	NO RECOVERY.		
	67	56	0	Av:70 Min:NI Max:90			19.00			
							(1.00)	Weak thinly laminated black shaley MUDSTONE. Partially weathered. Dip 20degrees. Fractures very closely planar smooth clean bedding parallel, possibly drilling induced.		
20.00							20.00	Complete at 20.00m		

Remarks	**Scale (approx)**	**Logged By**
	1:40	PW
	Figure No.	
	LKC 20 1120.RBH3	

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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 84 mm **Method :**	**Casing Diameter** 125mm cased to 14.00m **Location**	**Ground Level (mOD)** **Dates** 01/09/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 1/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.15) 0.15	MADE GROUND: Brown silty gravelly SAND with occasional rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
								Light brown CLAY with frequent sand and gravel bands.		
							(13.85)			

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
LKC 20 1120.RBH4

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LK GROUP

LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site
Collyhurst Village, Manchester

Borehole Number
RBH4

Machine : Beretta T41
Flush : Mist
Core Dia : 84 mm
Method :

Casing Diameter
125mm cased to 14.00m

Ground Level (mOD)

Client
Far East Consortium International Limited

Job Number
LKC 20 1120

Location

Dates
01/09/2020

Project Contractor
D&I

Sheet
2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
14.00							14.00	NO RECOVERY.		
							(1.70)			
	35	30	11.6	Av:NI Min:NI Max:350			15.70 (0.30)	NOT INTACT. Siltstone recovered as gravel and clay.		

Remarks

Scale (approx)
1:40

Logged By
PW

Figure No.
LKC 20 1120.RBH4

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Machine : Beretta T41 **Flush :** Mist **Core Dia :** 84 mm **Method :**	**Casing Diameter** 125mm cased to 14.00m **Location**	**Ground Level (mOD)** **Dates** 01/09/2020	**Client** Far East Consortium International Limited **Project Contractor** D&I	**Job Number** LKC 20 1120 **Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	I_f (mm)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							16.00			
							(0.45)	Very weak thinly laminated grey interbedded SILTSTONE and fine SANDSTONE. Distinctly weathered. Dip 20degrees. Fractures very closely spaced planar smooth clean bedding parallel, possibly drilling induced.		
							16.45	Subvertical undulating closed fracture from 16.00-20.00mbgl. Weak by 16.30mbgl.		
							16.47			
							(0.53)	Orange fine SAND. Possibly a band of completely weathered sandstone.		
17.00							17.00	Weak thinly laminated grey interbedded SILTSTONE and fine SANDSTONE. Distinctly weathered. Dip 20degrees. Fractures very closely spaced planar smooth clean bedding parallel, possibly drilling induced.		
	96	85	8.6	Av:60 Min:NI Max:130				Weak thinly laminated black shaley MUDSTONE with rare light grey fine sandstone inclusions. Partially weathered. Dip 20degrees. Fractures very closely planar smooth clean bedding parallel, possibly drilling induced. Destructured at 17.65-17.76mbgl.		
18.50							(3.00)			
	93	88	52	Av:110 Min:NI Max:150				Destructured at 19.12-19.20mbgl.		
20.00							20.00	Complete at 20.00m		

Remarks

Scale (approx)	Logged By
1:40	PW

Figure No.
LKC 20 1120.RBH4

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LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site	Number
Collyhurst Village, Manchester	WS1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sample driven to 3.44mbgl.		60.61	Far East Consortium International Limited	LKC 20 1120

Location	Dates	Project Contractor	Sheet
385606.3 E 400419.4 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
				60.51	(0.10) 0.10	MADE GROUND: Dark greyish brown slightly gravelly sandy SILT with frequent rootlets and rare clinker. Sand is fine to medium. Gravel is fine to medium and subrounded to subangular comprising sandstone.
0.10-0.50	D1 PID=0.1ppm				(0.40)	
				60.11	0.50	MADE GROUND: Dark brown gravelly sandy silty CLAY with occasional brick fragments, coal fragments and rare ash. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.
0.60-1.00	DB2 PID=<0.1ppm					
1.20-1.65	SPT N=14		3,3/3,3,4,4			Firm to very stiff consistency brown to light yellowish brown mottled slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to medium and angular to subangular comprising sandstone and mudstone. Less sand and gravel content with depth.
1.20-1.65	X3					
1.50-2.00	B4					
					(2.94)	
2.00-2.45	SPT N=21		2,3/4,5,6,6			
2.00-2.45	X5					Noted to be silty between 2.50-3.00mbgl.
3.00-3.44	SPT 50/290		8,9/11,13,13,13			
3.00-3.44	X6					
				57.17	3.44	SPT refusal at 3.44mbgl on hard consistency CLAY.
						Complete at 3.44m

Remarks
SPT refusal at 3.44mbgl on hard consistency CLAY.
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	Logged By
1:40	HM

Figure No.
LKC 20 1120.WS1

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		56.11	Far East Consortium International Limited	LKC 20 1120
	Location 385650.9 E 400266.7 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.30	D1				(0.50)	MADE GROUND: Dark greyish brown slightly gravelly very sandy SILT with occasional rootlets, rare brick fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
				55.61	0.50	Layer of bricks at 0.30-0.50mbgl.			
1.20-1.65 1.20-1.50	SPT N=15 D2		3,2/3,4,4,4			MADE GROUND: Medium dense to very loose black to dark orangish brown gravelly SAND with frequent ash, occasional brick fragments, clinker, rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone and mudstone. Frequent ash and clinker between 1.00-2.00mbgl.			
2.00-2.45	SPT N=12		1,2/2,3,3,4			Layer of dark grey gravelly sandy SILT with frequent ash, brick fragments and rare clinker between 2.00-2.10mbgl.			
3.00-3.45	SPT N=4		1,1/1,1,1,1		(4.95)	Very loose below 3.00mbgl.			
4.00-4.45	SPT N=0		1,0/0,0,0,0			Dark orangish brown below 4.00mbgl.			
5.00-5.45	SPT N=1		1,0/0,1,0,0						
				50.66	5.45	Complete at 5.45m			

Remarks
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS10

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Site	Number
Collyhurst Village, Manchester	**WS11**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385530 E 400276 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	Blackish brown gravelly silty SAND with occasional rootlets, brick fragments and rare clinker. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.		
					0.40	Refusal at 0.40mbgl on sandstone cobble.		
						Complete at 0.40m		

Remarks
Refusal at 0.40mbgl on sandstone cobble, borehole relocated.

Scale (approx)	Logged By
1:40	HM

Figure No.
LKC 20 1120.WS11

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Excavation Method Drive-in Windowless Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location	**Dates** 13/07/2020- 24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	MADE GROUND: Blackish brown gravelly silty SAND with occasional rootlets, brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Refusal at 0.30mbgl on sandstone cobble. Complete at 0.30m		

Remarks

Scale (approx)	Logged By
1:40	

Figure No.
LKC 20 1120.WS11B

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sampler			Far East Consortium International Limited	LKC 20 1120
	Location	**Dates** 13/07/2020- 24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	MADE GROUND: Blackish brown gravelly silty SAND with occasional rootlets, brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Refusal at 0.30mbgl on sandstone cobble. Complete at 0.30m		

Remarks

Scale (approx)	**Logged By**
1:40	

Figure No.
LKC 20 1120.WS11B

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 3.37mbgl.		58.05	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385536.8 E 400277.9 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.40	D1				(0.40)	MADE GROUND: Blackish brown gravelly sandy SILT with occasional rootlets, brick fragments, rare clinker and ash. Sand is fine to medium. Gravel is fine to coarse and rounded to angular comprising sandstone and mudstone.			
				57.65	0.40				
0.50-1.00	DB2					Stiff to hard consistency brown grey mottled slightly gravelly CLAY with rare sandstone cobbles. Gravel is fine to coarse and subangular comprising sandstone.			
1.00	PP 171.8kPa								
1.20-1.65	SPT N=17		2,3/4,4,4,5						
1.20-1.65	X3								
					(2.97)				
2.00	PP 1843.7kPa					Hard consistency below 2.00mbgl.			
2.00-2.45	SPT N=30		4,4/6,7,8,9						
2.00-2.45	X4					No grey mottling below 2.50mbgl.			
3.00	PP 220.8kPa								
3.00-3.37	SPT 50/220		9,11/14,18,18						
3.00-3.37	X5								
				54.68	3.37	SPT refusal at 3.37mbgl on hard consistency clay.			
						Complete at 3.37m			

Remarks
Borehole dry and stable.
Location accurate to 5.00-8.00m.
SPT refusal at 3.37mbgl on hard consistency clay.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS11D

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample to driven to 5.45mbgl.		56.98	Far East Consortium International Limited	LKC 20 1120
	Location 385559 E 400263.8 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.20	D1				(0.30)	MADE GROUND: Blackish gravelly silty SAND with frequent rootlets, occasional brick fragments, rare glass, ash and clinker. Sand is fine to medium. Gravel is fine to medium angular comprising sandstone.			
0.30-1.00	D2			56.68	0.30				
					(0.70)	MADE GROUND: Orangish brown very gravelly SAND with frequent brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone.			
1.20	PP 171.6kPa			55.98	1.00				
1.20-1.65	SPT N=15		7,7/6,3,3,3			Very stiff consistency high strength brown slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.			
1.20-1.60	D4				(0.70)				
1.20-1.65	X3								
1.70-2.00	B5			55.28	1.70				
2.00	PP 85.8kPa					Firm to stiff consistency medium to high strength brown grey mottled slightly gravelly CLAY. Gravel is fine to medium and subangular comprising sandstone and mudstone.			
2.00-2.45	SPT N=17		3,3/3,4,5,5						
2.00-2.45	X6								
2.70-3.00	B7				(2.10)				
3.00	PP 73.6kPa								
3.00-3.45	SPT N=13		3,3/3,3,3,4						
3.00-3.45	X3								
				53.18	3.80				
4.00-4.45	SPT N=16		2,3/3,4,4,5			Firm consistency greyish brown slightly sandy silty CLAY with slight organic odour. Sand is fine to medium. Sand content decreases with depth.			
4.00-4.45	X4								
					(1.65)				
5.00-5.45	SPT N=9		2,2/2,2,2,3			Damp strata at base.			
5.00-5.45	X5								
				51.53	5.45				
						Complete at 5.45m			

Remarks
Location accurate to 5.00-8.00m.
Damp strata below 5.00mbgl.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS12

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		62.42	Far East Consortium International Limited	LKC 20 1120
	Location 385564.3 E 400431.4 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.50	D1				(0.70)	MADE GROUND: Dark grey gravelly silty SAND with occasional brick fragments, rare plastic, ceramic fragments, ash and clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
				61.72	0.70	Layer of ash between 0.60-0.70mbgl.			
0.80-1.70	D2					MADE GROUND: Brown slightly gravelly sandy CLAY (dessicated) with occasional brick fragments, ceramic fragments, rare roots, clinker and coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising mudstone.			
1.20-1.65	SPT N=12		3,3/3,3,3,3		(1.00)				
1.60-1.65	X3			60.72	1.70				
1.70-2.00	D4					Stiff to hard consistency high to very high strength brown slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone and mudstone. Less sand and gravel content with depth.			
2.00	PP 134.8kPa								
2.00-2.45	SPT N=24		3,4/5,6,6,7						
2.00-2.45	X5								
2.50-3.00	B6								
3.00	PP 147.1kPa								
3.00-3.45	SPT N=38		8,8/8,10,10,10						
3.00-3.45	X7					Thin layer of silty SAND between 3.00-3.05mbgl.			
					(3.75)				
4.00-4.45	SPT N=32		6,6/7,8,8,9						
4.00-4.45	X8								
5.00-5.45	SPT N=44		8,8/10,11,11,12						
5.00-5.45	X9								
				56.97	5.45	Complete at 5.45m			

Remarks
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS13

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 1.70mbgl.			Far East Consortium International Limited	LKC 20 1120
	Location 385626 E 400218 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1 PID=				(0.40) 0.40	MADE GROUND: Dark greyish brown gravelly very sandy SILT with frequent rootlets, rare brick fragments, clinker, coal fragments, metal and plastic. Sand is fine to medium. Gravel is fine to coarse and rounded to angular comprising sandstone and mudstone.		
					(0.80) 1.20	MADE GROUND: Dark greyish brown sandy GRAVEL with occasional brick fragments, concrete fragments and rare sandstone cobbles. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.		
1.20-1.65	SPT N=9		2,2/3,2,2,2		(0.50) 1.70	MADE GROUND: Grey gravelly sandy silty CLAY with frequent ash and brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Sampler refusal at 1.70bgl on sandstone cobble		
						Complete at 1.70m		

Remarks
Borehole dry and stable.
Sampler refusal at 1.70mbgl on possible sandstone cobble. Borehole relocated (See WS14B).
Location accurate to 5.00-8.00mbgl.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS14

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		55.56	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385624.2 E 400221.3 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.40)	MADE GROUND: Dark greyish brown gravelly very sandy SILT with frequent rootlets, rare brick fragments, clinker, coal fragments, metal and plastic. Sand is fine to medium. Gravel is fine to coarse and rounded to angular comprising sandstone and mudstone.			
0.40-1.00	D1			55.16	0.40				
					(1.60)	MADE GROUND: Dark brown slightly clayey gravelly SAND with frequent brick fragments, occasional clinker, rare plastic, clay inclusions and coal fragments. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone and mudstone.			
1.20-1.65	SPT N=12		3,3/3,3,3,3						
1.60-2.00	D2					Occasional tarmacadam fragments and light hydrocarbon odour between 1.60-2.00mbgl.			
2.00-2.45	SPT N=0		1,0/0,0,0,0	53.56	2.00	MADE GROUND: Grey slightly gravelly sandy silty CLAY with occasional pottery fragments, ash and brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone. Damp strata below 2.00mbgl.			
					(2.00)				
3.00-3.45	SPT N=0		1,0/0,0,0,0						
4.00-4.45	SPT N=1		1,0/0,0,0,1	51.56	4.00	Soft consistency grey slightly gravelly silty CLAY. Gravel is fine to medium and subangular comprising sandstone.			
4.00-4.50	D3								
					(1.45)				
5.00-5.45	SPT N=2		1,1/2,0,0,0						
				50.11	5.45	Complete at 5.45m			

Remarks
Damp strata below 2.00mbgl.
Borehole stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS14B

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 2.37mbgl.		55.81	Far East Consortium International Limited	LKC 20 1120
	Location 385528.9 E 400221.3 N	**Dates** 13/07/2020- 24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.70	D1 PID=<0.1ppm				(0.70)	MADE GROUND: Light brown sandy very gravelly CLAY with occasional concrete fragments, rare brick fragments and ash. Sand is fine to medium. Gravel is fine to coarse and subangular comprising limestone and mudstone.			
				55.11	0.70				
0.80-1.00 1.00	DB2 PID=<0.1ppm PP 171.68kPa				(0.50)	Very stiff consistency very high strength brown and grey mottled slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
1.20-1.65	SPT N=23		2,3/4,6,6,7	54.61	1.20				
1.40-1.80	B3				(1.17)	Very dense brown to orangish brown slightly gravelly slightly clayey SAND with rare clay inclusions and coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone. Clay content decreases with depth.			
2.00-2.37	SPT 50/220		8,8/10,17,23 Water strike(1) at 2.10m.			Wet strata below 2.00mbgl.		▽1	
				53.44	2.37	SPT refusal at 2.37mbgl on very dense SAND.			
						Complete at 2.37m			

Remarks
Groundwater strike at 2.10mbgl.
SPT refusal at 2.37mbgl on very dense SAND.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS15

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		54.89	Far East Consortium International Limited	LKC 20 1120
	Location 385575.3 E 400231.7 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.30	D1				(0.40)	MADE GROUND: Blackish brown gravelly sandy SILT with occasional clinker, rare brick fragments and glass. Sand is fine to medium. Gravel is fine to medium and angular to subangular comprising sandstone and slate.			
0.50-1.50	D2			54.49	0.40	MADE GROUND: Dark brown and orangish brown mottled sandy very gravelly CLAY with frequent ash, clinker, occasional blue-glazed pottery fragments, rare glass, plastic, metal fragments and coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone, mudstone and shale.			
1.20-1.65	SPT N=0		1,0/0,0,0,0						
2.00-2.45	SPT N=0		1,0/0,0,0,0		(2.60)				
3.00-3.45	SPT N=1		1,0/0,0,0,1	51.89	3.00	MADE GROUND: Dark grey slightlly gravelly silty CLAY with occasional oyster shells and rare clinker. Gravel is fine to medium and subangular comprising mudstone.			
4.00-4.45	SPT N=1		1,0/0,0,1,0						
4.60-5.00	D3				(2.45)				
5.00-5.45	SPT N=2		1,0/0,0,1,1						
				49.44	5.45	Complete at 5.45m			

Remarks
Borehole dry and stable.
Location accurate to 5.0-8.0m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS16

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	Site Collyhurst Village, Manchester	Number WS17

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sample driven to 5.45mbgl.		55.37	Far East Consortium International Limited	LKC 20 1120
	Location 385562.6 E 400211.5 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.60)	MADE GROUND: Greyish brown sandy very clayey GRAVEL with rare brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising limestone, quartz and sandstone.			
0.60-1.00	D1 PID=0.1ppm			54.77	0.60				
					(0.40)	MADE GROUND: Dark greyish brown gravelly sandy silty CLAY with occasional brick fragments, coal fragments, rare ash and pottery fragments. Sand is fine to medium. Gravel is fine to medium and subangular to angular comprising sandstone and mudstone.			
1.20-1.65	SPT N=1		2,2/0,0,0,1	54.37	1.00				
1.20-2.20	D2 PID=0.3ppm								
					(1.80)	MADE GROUND: Dark greyish brown to black gravelly SAND with frequent ash, occasional brick fragments, clinker and rare pottery fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone and mudstone. Layer of predominantly ash between 1.800-2.00mbgl.			
2.00-2.45	SPT N=8		2,2/2,2,2,2			Borehole collapsing from 2.50mbgl.			
2.80-3.50	D3 PID=0.3ppm			52.57	2.80				
3.00-3.45	SPT N=21		3,3/4,5,6,6			MADE GROUND: Dark brown gravelly sandy CLAY with occasional brick fragments, coal fragments and ash. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone and mudstone.			
					(0.70)				
3.80-4.00	DB4 PID=0.1ppm			51.87	3.50				
4.00	PP 98.1kPa					Firm to stiff consistency high strength slightly gravelly sandy to very sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.			
4.00-4.45	SPT N=9		2,2/2,2,2,3						
4.00-4.45	X5								
					(1.95)				
5.00-5.45	SPT N=10		2,2/2,2,3,3						
5.00-5.45	X6								
				49.92	5.45				
						Complete at 5.45m			

Remarks
Borehole collapsing from 3.00mbgl.
Borehole dry.
Location accurate to 5.00-8.00mbgl.

Scale (approx)	Logged By
1:40	HM

Figure No.
LKC 20 1120.WS17

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 4.30mbgl.		54.77	Far East Consortium International Limited	LKC 20 1120
	Location 385518.3 E 400140.4 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.40	D1				(0.40)	MADE GROUND: Dark grey slightly sandy gravelly silty CLAY with occasional brick fragments, rare concrete fragments and rootlets. Sand is fine to medium. Gravel is fine to coarse and subangular comprising limestone and sandstone.			
0.40-1.00	D2			54.37	0.40	MADE GROUND: Orangish brown to greyish brown organic sandy CLAY with occasional brick fragments, coal fragments, rare plastic and rootlets. Sand is fine to medium. Gravel is fine to medium and subangular to angular comprising sandstone comprising sandstone and mudstone.			
1.20-1.65	SPT N=11		2,2/2,3,3,3		(0.80)				
1.20-2.00	D3			53.57	1.20	MADE GROUND: Black gravelly SAND of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to medium and subangular.			
2.00-2.45	SPT N=3		1,0/1,0,1,1		(0.80)				
				52.77	2.00	MADE GROUND: Dark greyish brown to dark brown very gravelly very sandy CLAY with frequent ash, clinker, occasional coal fragments and rare glass. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone, mudstone and shale. Less sand and gravel with increasing depth. Dark brown below 2.00mbgl.			
3.00-3.45	SPT N=8		1,1/2,2,2,2		(1.00)				
3.00-3.50	D4			51.77	3.00	Soft to firm consistency light grey silty CLAY (possible reworked).			
				51.27	3.50	Firm to stiff consistency orangish brown slightly gravelly CLAY. Gravel is fine to coarse and subangular comprising sandstone.			
4.00-4.30	SPT 50/150		8,10/22,28		(0.80)				
4.00-4.30	X5			50.47	4.30	SPT refusal at 4.30mbgl on stiff consistency gravelly CLAY (possible sandstone cobble).			
						Complete at 4.30m			

Remarks
Borehole dry and stable.
SPT refusal at 4.30mbgl on stiff consistency gravelly CLAY (possible sandstone cobble).
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS18

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		59.33	Far East Consortium International Limited	LKC 20 1120
	Location 385668.3 E 400407.8 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.30	D1				(0.40)	MADE GROUND: Brown gravelly silty SAND with occasional clinker, brick fragments and concrete fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
				58.93	0.40				
0.70-1.00	D2				(0.60)	MADE GROUND: Dark greyish brown gravelly sandy CLAY with occasional ash, coal fragments, concrete fragments, rare clinker and sandstone cobbles. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone.			
				58.33	1.00				
1.20-1.65 1.20-1.50	SPT N=42 D3		9,10/10,10,10,12		(0.70)	MADE GROUND: Black slightly silty gravelly SAND with frequent ash, occasional clinker and rare oyster shells. Sand is fine to medium. Gravel is fine to medium and angular to subangular comprising mudstone.			
1.70-2.00	B4			57.63	1.70				
2.00 2.00-2.45 2.00-2.45	PP 85.8kPa SPT N=11 X5		2,2/3,2,3,3			Soft to firm consistency medium to high strength brown slightly sandy silty CLAY with occasional silt layers. Sand is fine to medium. Layer of light greyish brown SILT at 2.00-2.10mbgl.			
2.50-3.00	B6								
					(2.30)				
3.00 3.00-3.45 3.00-3.45	PP 49.1kPa SPT N=8 X7		2,2/2,2,2,2			Layer of light greyish brown SILT at 2.95-3.00mbgl. Soft consistency between 3.50-4.00mbgl.			
4.00-4.45 4.00-4.45	X8 SPT N=4		Water strike(1) at 4.00m. 1,1/0,0,2,2	55.33	4.00	Soft to firm consistency brown slightly gravelly CLAY. Gravel is fine to medium and subangular comprising sandstone. Wet strata below 4.00mbgl.		▽1	
					(1.45)				
5.00-5.45 5.00-5.45	SPT N=9 X9		2,2/2,2,2,3						
				53.88	5.45	Complete at 5.45m			

Remarks
Wet strata below 4.00mbgl.
Location accurate to 5.00-8.00m.
Borehole stable.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS2

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 3.30mbgl.		62.00	Far East Consortium International Limited	LKC 20 1120
	Location 385560.9 E 400409.7 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.40	D1 PID=0.1ppm			61.90	(0.10) 0.10	MADE GROUND: Dark greyish brown slightly gravelly sandy silty CLAY with frequent rootlets, occasional brick fragments and rare sandstone cobbles. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.		
					(0.50)			
0.80-1.20	D2 PID=0.2ppm			61.40	0.60	MADE GROUND: Dark brown gravelly very sandy CLAY with occasional brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone.		
1.20-1.65	SPT N=12		3,3/3,3,3,3		(1.05)	MADE GROUND: Dark grey gravelly silty SAND with frequent brick fragments, occasional silt inclusions and rare clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.		
				60.35	1.65	NO RECOVERY - POSSIBLE VOID. Sampler dropped from 1.65-3.30mbgl, possible void. Borehole terminated.	VOID	
					(1.65)			
				58.70	3.30	Complete at 3.30m		

Remarks
Borehole dry and stable.
Possible void identified between 1.65-3.30mbgl. Borehole terminated and relocated (See WS13B).
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS3

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 3.24mbgl.		62.85	Far East Consortium International Limited	LKC 20 1120
	Location 385564.8 E 400399.5 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.50	D1				(0.50)	MADE GROUND: Dark grey slightly gravelly very silty SAND with occasional glass, ash and rare brick fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
				62.35	0.50				
0.50-0.80	D2				(0.40)	MADE GROUND: Grey slightly silty gravelly SAND with occasional clinker, ash and rare brick fragments. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone and mudstone. Layer of CLAY between 0.80-0.90mbgl.			
				61.95	0.90				
1.00-1.40 1.20 1.20-1.65 1.20-1.65	D3 PP 220.7kPa SPT N=20 X4		3,3/4,5,5,6		(1.10)	Very stiff to hard consistency very high strength brown and grey mottled slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone and mudstone.			
1.70-2.00	B5								
2.00 2.00-2.45 2.00-2.45	PP 183.9kPa SPT N=25 X6		3,4/5,6,7,7	60.85	2.00	Very hard consistency very high strength light brown silty CLAY.			
					(1.24)				
2.80 2.80-3.24 2.80-3.24	PP 196.2kPa SPT 50/290 X7		5,10/11,13,14,12						
				59.61	3.24	Complete at 3.24m			

Remarks
SPT refusal at 3.24mbgl on very hard consistency CLAY.
Borehole dry and stable.
Location accurate to 3.0-5.0m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS3B

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 4.24mbgl.		59.84	Far East Consortium International Limited	LKC 20 1120
	Location 385592.2 E 400378.2 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				59.74	(0.10) 0.10	MADE GROUND: Dark greyish brown slightly gravelly sandy SILT with frequent rootlets and rare clinker. Sand is fine to medium. Gravel is fine to medium and subrounded to subangular comprising sandstone.			
					(1.10)	MADE GROUND: Brown very gravelly very sandy CLAY with occasional brick fragments, concrete fragments, rare plastic and clinker. Sand is fine to medium. Gravel is fine to coarse and subrounded to angular comprising sandstone and mudstone.			
1.20 1.20-1.65	PP 110.3kPa SPT N=14		2,2/3,3,4,4	58.64	1.20	Very stiff consistency very high strength brown grey mottled slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
2.00 2.00-2.45	PP 171.6kPa SPT N=19		2,3/4,5,5,5		(1.70)				
3.00 3.00-3.45	PP 159.4kPa SPT N=32		7,8/8,8,8,8	56.94	2.90	Very stiff consistency very high strength light greyish brown slightly gravelly silty CLAY with occasional silt layers. Gravel is fine to medium and subangular comprising sandstone. Band of brownish grey slightly sandy SILT between 2.90-3.00mbgl. Band of brownish grey slightly sandy SILT between 3.20-3.30mbgl.			
					(1.34)				
4.00-4.24	SPT 50/90		8,10/11,14,14,11	55.60	4.24	SPT refusal at 4.24mbgl on very stiff consistency CLAY.			
						Complete at 4.24m			

Remarks
Borehole dry and stable.
SPT refusal at 4.24mbgl.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS4

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 5.45mbgl.		57.86	Far East Consortium International Limited	LKC 20 1120
	Location 385649.3 E 400364.4 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.30	D1 PID=0.2ppm				(0.50)	MADE GROUND: Dark greyish brown gravelly silty SAND with occasional concrete fragments, brick fragments and rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone.			
0.50-0.80	D2 PID=0.1ppm			57.36	0.50				
0.80-1.00	D3 PID=<0.1ppm			57.06	(0.30) 0.80	MADE GROUND: Grey sandy GRAVEL with frequent brick and coal fragments. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone and limestone.			
1.20 1.20-1.65 1.20-1.65	PP 61.3kPa SPT N=11 X4		Water strike(1) at 1.00m. 1,1/2,3,3,3			Firm to stiff consistency medium to high strength slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone and mudstone.		▽1	
1.60-2.00	B5								
2.00 2.00-2.45 2.00-2.45	PP 85.8kPa SPT N=8 X6		2,2/2,2,2,2 Water strike(2) at 2.10m.			Wet strata below 2.00mbgl.		▽2	
					(3.30)				
3.00 3.00-3.45 3.00-3.45	PP 98.1kPa SPT N=10 X7		2,2/2,2,3,3						
4.00-4.45 4.00-4.45	SPT N=7 X8		1,1/1,2,2,2 Water strike(3) at 4.50m.	53.76	4.10	Soft to firm consistency light brown slightly gravelly silty CLAY. Gravel is fine to coarse and subangular comprising mudstone. Less gravel content with depth.		▽3	
					(1.35)				
5.00-5.45 5.00-5.45	SPT N=8 X9		1,1/2,2,2,2						
				52.41	5.45	Complete at 5.45m			

Remarks
Groundwater at 1.00mbgl, 2.10mbgl and 4.50mbgl.
Borehole stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS5

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Site	Number
Collyhurst Village, Manchester	**WS6**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sample driven to 4.42mbgl.		59.58	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385565.5 E 400343.3 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00-0.30	D1				(0.50)	MADE GROUND: Dark brown gravelly silty SAND with frequent brick fragments and rare clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.
0.50-0.80	D2			59.08	0.50	
0.80-1.00	D3				(0.30)	MADE GROUND: Brown slightly gravelly slightly sandy CLAY with occasional brick fragments, coal fragments, ash and rare clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.
1.20	PP 171.6kPa			58.78	0.80	
1.20-1.65	SPT N=21		2,3/5,5,5,6			Very stiff consistency brown grey mottled slightly gravelly CLAY. Gravel is fine to coarse and subangular comprising sandstone and mudstone.
1.20-1.65	X4					
1.70-2.00	B5					
2.00	PP 171.6kPa					
2.00-2.45	SPT N=24		3,4/5,6,6,7			
2.00-2.45	X6					
					(3.62)	
3.00	PP 183.9kPa					
3.00-3.45	SPT N=40		4,6/9,10,10,11			
3.00-3.45	X7					
4.00-4.42	SPT 50/270		7,11/12,13,15,10			
4.00-4.42	X8					
				55.16	4.42	SPT refusal at 4.42mbgl on hard consistency clay.
						Complete at 4.42m

Remarks
SPT refusal at 4.42mbgl on hard consistency clay.
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	Logged By
1:40	HM

Figure No.
LKC 20 1120.WS6

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 0.60mbgl.		58.90	Far East Consortium International Limited	LKC 20 1120
	Location 385602 E 400355.6 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.60)	MADE GROUND: Dark brown gravelly very silty SAND with occasional whole bricks and concrete fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to subrounded comprising sandstone and mudstone.		
				58.30	0.60	Refusal at 0.60mbgl on layer of whole bricks (possible relic foundation).		
						Terminated at 0.60m		

Remarks
Refusal at 0.60mbgl on layer of whole bricks (possible relic foundation). Borehole relocated.
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS7

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 0.45mbgl.		58.70	Far East Consortium International Limited	LKC 20 1120
	Location 385601.7 E 400351.5 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.45)	MADE GROUND: Dark brown gravelly very silty SAND with occasional whole bricks and concrete fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to subrounded comprising sandstone and mudstone.		
				58.25	0.45	Refusal at 0.45mbgl on layer of whole bricks (possible relic foundation).		
						Terminated at 0.45m		

Remarks
Location accurate to 5.00-8.00m.
Refusal at 0.45mbgl on layer of whole bricks (possible relic foundation). Borehole relocated.
Borehole dry and stable.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS7

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Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 1.30mbgl.		58.70	Far East Consortium International Limited	LKC 20 1120
	Location 385603.9 E 400350.9 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.60	D1 PID=0.2ppm				(0.60)	MADE GROUND: Dark brown gravelly very silty SAND with occasional whole bricks and concrete fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to subrounded comprising sandstone and mudstone.		
				58.10	0.60			
					(0.60)	MADE GROUND: Brown gravelly clayey SAND with occasional brick fragments, concrete fragments and ash. Sand is fine to coarse. Gravel is fine to coarse and subangular to subrounded comprising sandstone and mudstone.		
				57.50	1.20			
				57.40	(0.10) 1.30	MADE GROUND: Concrete. SPT refusal at 1.30mbgl on concrete.		
						Terminated at 1.30m		

Remarks
Refusal at 1.20mbgl on concrete. Borehole abandoned.
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS7

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Site	Number
Collyhurst Village, Manchester	WS8

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sample driven to 5.45mbgl.		57.89	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385621.1 E 400326.9 N	13/07/2020-24/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00-0.20	D1 PID=0.1ppm				(0.30)	MADE GROUND: Blackish brown slightly gravelly sandy SILT with frequent rootlets, occasional brick fragments and rare glass. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.
				57.59	0.30	
					(0.50)	MADE GROUND: Grey slightly clayey sandy GRAVEL with rare brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and limestone.
0.80-1.50	D2 PID=0.3ppm			57.09	0.80	
1.20-1.65	SPT N=11		2,2/2,3,3,3		(1.00)	MADE GROUND: Brown slightly gravelly slightly sandy CLAY with occasional brick fragments and ash. Sand is fine to medium. Gravel is fine to medium and angular to subangular comprising sandstone and mudstone.
1.80-2.00	D3 PID=0.2ppm			56.09	1.80	
					(0.20)	MADE GROUND: Dark grey organic slightly gravelly silty CLAY with rare wood fragments, metal fragments and clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising mudstone.
2.00-2.45	SPT N=15		5,6/6,3,3,3	55.89	2.00	
2.10-3.00	D4 PID=0.3ppm					MADE GROUND: Brownish orange very gravelly SAND with requent ash, occasional clinker, oyster shells and rare clay inclusions. Sand is fine to medium. Gravel is fine to coarse and angular to subangular comprising sandstone and mudstone. Layer of gravel at 2.00-2.10mbgl.
3.00-3.45	SPT N=10		3,3/4,2,2,2		(2.60)	
4.00-4.45	SPT N=3		1,0/0,1,1,1			
			Water strike(1) at 4.50m.			Wet strata below 4.50mbgl.
4.60-5.00	D5 PID=0.1ppm			53.29	4.60	Soft to firm consistency slightly gravelly silty CLAY. Gravel is fine to medium and subangular comprising mudstone (possible reworked).
5.00-5.45	SPT N=7		1,1/1,2,2,2		(0.85)	
5.00-5.45	X6			52.44	5.45	Complete at 5.45m

Remarks
Groundwater noted at 4.50mbgl.
Borehole stable.
Location accurate to 5.00-8.00m.

Scale (approx)	Logged By
1:40	HM

Figure No.
LKC 20 1120.WS8

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Number** **WS9**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sample driven to 4.12mbgl.		57.34	Far East Consortium International Limited	LKC 20 1120
	Location 385595 E 400290 N	**Dates** 13/07/2020-24/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.60	D1					MADE GROUND: Black gravelly silty SAND with occasional sandstone cobbles, clinker, rare pottery fragments, wood fragments and coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising mudstone.			
					(1.80)				
1.20-1.65	SPT N=0		1,0/0,0,0,0						
1.20-1.50	D2								
1.50-2.00	B3								
				55.54	1.80				
2.00	PP 141kPa					Stiff to very stiff consistency high to very high strength brown slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone.			
2.00-2.45	SPT N=10		1,1/2,2,3,3						
2.00-2.45	X3								
3.00	PP 190kPa				(2.32)				
3.00-3.45	SPT N=49		8,8/10,11,13,15						
3.00-3.45	X4								
3.70-4.12	SPT 50/270		10,10/12,13,14,11			Very sandy clay noted in SPT recovery between 3.70-4.12mbgl.			
3.70-4.12	X5								
				53.22	4.12	SPT refusal at 4.12mbgl on very stiff clay.			
						Complete at 4.12m			

Remarks
Borehole dry and stable.
Location accurate to 5.00-8.00m.

Scale (approx)	**Logged By**
1:40	HM

Figure No.
LKC 20 1120.WS9

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** SA101
Excavation Method Machine excavated trial hole to 2.70mbgl.	**Dimensions**	**Ground Level (mOD)** 58.15	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385647.8 E 400367.3 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				57.85	(0.30) 0.30	MADE GROUND: Dark greyish brown gravelly silty SAND with occasional concrete fragments, brick fragments and rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and mudstone.		
				57.65	(0.20) 0.50	MADE GROUND: Orangish brown gravelly SAND with frequent brick fragments, occasional whole bricks and rare metal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Concrete slab at 0.30mbgl, plastic sheet beneath slab.		
				56.95	(0.70) 1.20	MADE GROUND: Dark brown gravelly sandy CLAY with occasional clinker, brick fragments, rare ash and coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to angular comprising sandstone and mudstone.		
				56.45	(0.50) 1.70	Firm consistency brown slightly gravelly slightly sandy CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone (possible reworked).		
			Water strike(1) at 2.40m.		(1.00)	Stiff consistency brown slightly gravelly CLAY. Gravel is fine to coarse and subangular comprising sandstone. Becoming stiffer with depth.		▽1
				55.45	2.70	Complete at 2.70m		

Plan

Remarks

Slow inflow of water at 2.40mbgl.
Trial pit stable.

Scale (approx)	Logged By	Figure No.
1:40	HM	LKC 20 1120.SA101

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **SA102**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Machine excavated trial hole to 2.0		59.98	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385593.4 E 400385.6 N	16/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				59.68	(0.30) 0.30	MADE GROUND: Dark brown gravelly clayey SAND with occasional brick fragments, rare glass and plastic. Sand is fine to coarse. Gravel is fine to coarse and subangular comprising sandstone.		
					(1.00)	MADE GROUND: Dark brown gravelly SAND with occasional brick (whole and fragments), rare ash, metal and concrete. Sand is fine to coarse. Gravel is fine to coarse and subangular comprising sandstone.		
			Water strike(1) at 1.60m.	58.68	1.30 (0.70)	Soft to firm consistency brown and grey mottled sandy CLAY with occasional sand lenses. Sand is fine to coarse. Becoming stiffer consistency with depth (possible reworked).		▽1
				57.98	2.00	Complete at 2.00m		

Plan

Remarks

Groundwater strike at 1.60mbgl, rising to 1.40mbgl after 20 minutes.
Trial pit stable.

Scale (approx)	**Logged By**	**Figure No.**
1:40	HM	lkc 20 1120.SA102

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **SA103**
Excavation Method Machine excavated trial pit to 2.10mbgl.	**Dimensions**	**Ground Level (mOD)** 59.70	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385570.9 E 400329.6 N	**Dates** 23/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND: Black slightly silty gravelly SAND with occasional rootlets, occasional glass fragments and brick fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising		
				59.30	0.40			
					(0.70)	MADE GROUND: Black gravelly SAND with frequent ash, occasional bricks (whole and fragments), sandstone cobbles and clinker. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone and limestone.		
				58.60	1.10			
					(1.00)	Stiff to very stiff consistency brown and grey mottled sandy CLAY. Sand is fine to medium. Layer of light brown SAND between 1.20-1.60mbgl along the N wall of pit.		
				57.60	2.10			
						Complete at 2.10m		

Plan

Remarks

Trial pit dry and stable.

Scale (approx)	Logged By	Figure No.
1:40	HM	LKC 20 1120.SA103

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **SA104**
Excavation Method Machine excavated trial pit to 2.00mbgl.	**Dimensions**	**Ground Level (mOD)** 58.68	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385537.5 E 400283.2 N	**Dates** 01/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND: Dark brown gravelly silty SAND with occasional rootlets and brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.		
				58.28	0.40			
					(1.50)	Stiff to very stiff consistency brown and grey mottled slightly gravelly CLAY. Gravel is fine to coarse and subangular comprising sandstone and quartz.		
				56.78	1.90	Brown silty fine to medium SAND.		
				56.68	2.00	Complete at 2.00m		

Plan

Remarks

Borehole dry and stable.

Scale (approx)	Logged By	Figure No.
1:40	HM	LKC 20 1120.SA104

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **SA105**
Excavation Method Trial Pit	**Dimensions**	**Ground Level (mOD)** 55.66	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385531.1 E 400210.2 N	**Dates** 23/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.50)	MADE GROUND: Light brown clayey GRAVEL. Gravel is fine to coarse and subangular comprising limestone.		
				55.16	0.50	Old cast iron pipe on northern wall of trial pit at 0.30mbgl, travelling in an approximate E-W direction along northern wall.		
					(1.60)	MADE GROUND: Black gravelly SAND with frequent bricks (whole and fragments), ash, occasional clinker, metal fragments, glass, pottery fragments. Sand is fine to medium. Gravel is fine to coarse and angular to subanugular comprising sandstone and mudstone. Brick wall (relic foundation/basement) on eastern side of trial pit wall extending between 0.50-1.20mbgl. Old cast iron pipe on northern wall of trial pit at 0.60mbgl, travelling in an approximate E-W direction along northern wall. Trial pit collapse from 0.60mbgl.		
				53.56	2.10			
					(0.20)	Orangish brown slightly clayey SAND. Sand is fine to coarse.		
				53.36	2.30			
						Complete at 3.00m		

Plan

Remarks

Trial pit unstable.
Trial pit dry.

Scale (approx)	Logged By	Figure No.
1:40		LKC 20 1120.SA105

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **SA106**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Machine excavated trial pit to 2.00mbgl.		55.83	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385517.3 E 400210.8 N	23/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND: Grey clayey GRAVEL. Gravel is fine to coarse and subangular comprising limestone.		
				55.43	0.40			
					(0.20)	MADE GROUND: Dark brown gravelly clayey SAND with occasional brick fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.		
				55.23	0.60			
					(1.35)	Stiff consistency brown and grey mottled slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Becoming sandier with depth.		
				53.88	1.95			
				53.83	2.00	Orangish brown fine to coarse SAND.		
						Complete at 2.00m		

Plan

Remarks

Trial hole dry and stable.

Scale (approx)	**Logged By**	**Figure No.**
1:40	HM	LKC 20 1120.SA106

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP101**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.99	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385591.3 E 400253.7 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	D1				(1.40)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional masonry, whole brick and fragments and rare sandstone slabs. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
1.40-2.40	D2			54.59	1.40	MADE GROUND: Black gravelly SAND of predominantly ash and clinker with occasional pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(2.60)			
				51.99	4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP101

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP102**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 60.08	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385627.3 E 400415.6 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00	PP 132kPa							
0.12-0.85	D1			59.96	(0.12) 0.12	MADE GROUND: Tarmacadam.		
					(0.73)	MADE GROUND: Light grey SANDS and GRAVEL with rare small cobbles. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.		
0.85-1.90	D2			59.23	0.85	MADE GROUND: Soft consistency black and brown mottled sandy CLAY with rare brick fragments. Sand is fine to coarse. Moderate organic "bottom of pond" odour.		
					(1.05)			
1.90-2.50	DB3			58.18	1.90	Firm to stiff consistency brown and grey mottled CLAY.		
					(0.60)			
				57.58	2.50	Complete at 2.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP102

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP103**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.67	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385652.8 E 400411 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-3.00 0.00-0.40	PP 108kPa D1				(0.40)	MADE GROUND: Brown silty SAND with rare clinker. Sand is fine to coarse.		
0.40-1.20	D2			59.27	0.40	MADE GROUND: Black gravelly SAND of predominantly ash with occasional whole brick and fragments and rare metal. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(0.80)			
1.20-2.20	D3			58.47	1.20	MADE GROUND: Firm consistency brown and grey mottled CLAY with rare brick fragments and ash inclusions.		
					(1.30)			
2.50-3.50	DB4			57.17	2.50	Firm consistency brown CLAY.		
					(1.00)			
				56.17	3.50	Complete at 3.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP103

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP104**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.81	**Client** Far East Consortium International Limited **Job Number** LKC 20 1120
	Location 385622.3 E 400392.7 N	**Dates** 16/07/2020	**Project Contractor** D&I **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00	PP 108kPa			59.75	0.06	MADE GROUND: Tarmacadam.		
0.12-0.70	D1			59.69	0.12	MADE GROUND: CONCRETE.		
					(0.58)	MADE GROUND: Light grey cobbley gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone (quartzite).		
0.70-1.30	D2			59.11	0.70	MADE GROUND: Grey clayey SILT with occasional pottery fragments and plant remains. Slight organic "bottom of pond" odour. Duct resent within a trench of orange SAND at 0.70mbgl in the east of the pit. Potential electric cable.		
					(0.60)			
1.30-2.30	DB3			58.51	1.30	Firm to stiff consistency brown CLAY.		
					(1.00)			
				57.51	2.30	Complete at 2.30m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP104

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP105**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.48	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385642.3 E 400389.4 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-3.00 0.00-1.00	PP 108kPa D1				(1.10)	MADE GROUND: Brown gravelly SAND with occasional brick fragments, concrete and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
1.10-2.10	D2			58.38	1.10	MADE GROUND: Brown sandy gravelly CLAY with occasional brick fragments. Sand is fine to coare. Gravel is fine to coarse, subangular.		
					(1.30)	Pottery pipe present at 2.20mbgl.		
2.40-3.40	DB3			57.08	2.40	Firm consistency brown CLAY.		
					(1.00)			
				56.08	3.40	Complete at 3.40m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP105

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP106**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.31	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385660.5 E 400386.5 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 -3.00 0.00-0.30 0.30-1.10	PP 44kPa PP 103kPa D1 D2			59.01	(0.30) 0.30	MADE GROUND: Brown and grey gravelly SAND with occasional brick fragments, concrete and plastic. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(0.80)	MADE GROUND: Brown silty gravelly SAND with occasional whole brick and fragments, rare clay inclusions. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
1.10-1.90	D3			58.21	1.10	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(0.80)			
1.90-2.90	DB4			57.41	1.90	Soft to firm consistency brown and grey mottled silty CLAY with rare brick fragments near the top of the strata. Potentially reworked.		
					(1.20)			
				56.21	3.10	Complete at 3.10m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP106

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP107**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 60.01	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385595.8 E 400384.7 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 0.00-0.30	PP 128kPa D1				(0.30)	MADE GROUND: Dark brown clayey gravelly SAND with occasional brick fragments and plastic. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				59.71	0.30			
0.30-1.20	D2				(0.90)	MADE GROUND: Brown gravelly SAND with occasional clay inclusions, brick fragments, rare metal and concrete. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				58.81	1.20			
1.20-2.20	DB3				(1.30)	Firm brown and grey mottled sandy CLAY. Sand is fine to coarse. Hard and friable with depth. A pottery pipe is present within a MOT filled trench at 1.60mbgl in the north of the pit running alongside the pavement.		
				57.51	2.50	Complete at 2.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP107

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP108**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 61.22	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385565.8 E 400381.4 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-0.80 0.00-0.30	ACM D1				(0.30)	MADE GROUND: Brown silty SAND with frequent rootlets, rare pottery and plastic. Sand is fine to coarse.		
0.30-0.90	D2			60.92	0.30	MADE GROUND: Brown clayey gravelly SAND with occasional brick fragments, ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(0.60)			
0.90-1.90	DB3			60.32	0.90	Cast iron pipe present running approximately east to west at 0.70mbgl Potential ACM cement pipe present running approximately north to south at 0.80mbgl.		
					(1.20)	Stiff consistency brown and grey mottled sandy CLAY.		
				59.12	2.10	Complete at 2.10m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP108

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP109**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.17	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385622.9 E 400371.5 N	**Dates** 16/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.20 0.12-0.65	D3 D1			59.05	(0.12) 0.12	MADE GROUND: Tarmacadam.		
					(0.53)	MADE GROUND: Light grey cobbley gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.		
0.65-1.60	D2			58.52	0.65	MADE GROUND: Firm consistency brown slightly sandy slightly gravelly CLAY with occasional whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular. Cable present at 0.70mbgl. Pottery pipe present at 1.20mbgl.		
					(1.65)			
2.30-2.50	DB4			56.87	2.30	Pottery pipe present at 2.20mbgl within a trench of ash and clinker. Slightly oily with a moderate hydrocarbon odour.		
					(0.20)			
				56.67	2.50	Firm consistency brown silty CLAY. Laminated, hard and friable with depth.		
						Complete at 2.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP109

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 59.06	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385589.7 E 400352.6 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00	PP 191kPa			58.96	0.10	MADE GROUND: Brown silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse.		
0.10-1.10	D1				(1.00)	MADE GROUND: Brown sandy gravelly CLAY with frequent roots, occasional whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				57.96	1.10			
					(0.20)	MADE GROUND: CONCRETE slab. 10mm diameter rebar.		
				57.76	1.30			
				57.66	1.40	MADE GROUND: Light grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular of limestone.		
					(0.20)			
1.60-2.30	DB2			57.46	1.60	MADE GROUND: CONCRETE slab. No rebar.		
					(0.70)	Stiff consistency brown slightly sandy CLAY. Sand is fine to coarse.		
				56.76	2.30	Complete at 2.30m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP110

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP111**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.12	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385630.2 E 400347.6 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 -3.00 0.10-1.10	PP 88kPa PP 103kPa D1			58.02	0.10	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(1.30)	MADE GROUND: Brown gravelly SAND with frequent whole brick and fragments, occasional pottery, ash and clinker, pieces of clay and rare oyster shells. Sand is fine to coarse. Gravel is fine to coarse.		
1.40-2.40	DB2			56.72	1.40	Firm consistency brown and grey mottled sandy CLAY with rare rootlets. Sand is fine to coarse.		
					(1.60)			
				55.12	3.00	Complete at 3.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP111

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.81	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385581 E 400328.6 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 0.00-0.30	PP 128kPa D1				(0.30)	MADE GROUND: Brown silty slightly gravelly SAND with frequent rootlets, rare brick fragments and plastic. Sand is fine to coarse.		
0.30-1.00	D2			58.51	0.30	MADE GROUND: Light grey gravelly SAND with occasional brick fragments, plastic and rare timber. Sand is fine to coarse. Gravel is fine to coarse, subangular of limestone.		
					(0.70)			
				57.81	1.00	MADE GROUND: Concrete slab. No rebar present.		
					(0.20)			
1.20-2.20	DB3			57.61	1.20	Firm to stiff consistency brown and grey mottled sandy CLAY with occasional lenses of sand. Sand is fine to coarse.		
					(1.00)			
				56.61	2.20	Complete at 2.20m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP112

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.54	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385597.6 E 400325.7 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND: Brown gravelly SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular of limestone.		
				58.24	0.30			
0.40-1.30	D2			58.14	0.40	MADE GROUND: Grey fine to medium, subangular GRAVEL of limestone.		
					(0.90)	MADE GROUND: Brown clayey gravelly SAND with occasional whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				57.24	1.30	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(0.30)			
				56.94	1.60	MADE GROUND: Soft consistency black grey and brown mottled slightly gravelly sandy CLAY with rare coal inclusions. Sand is fine to coarse. Gravel is fine to medium, subangular.		
2.00-3.00	D3				(1.80)			
				55.14	3.40	Complete at 3.40m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP113

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Site	Trial Pit Number
Collyhurst Village, Manchester	TP114

Machine : JCB 3CX Method :	Dimensions	Ground Level (mOD)	Client	Job Number
		59.08	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385543 E 400302.5 N	13/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-1.00 -2.00 0.00-0.20 0.20-1.20	PP 186kPa PP 191kPa D1 DB2			58.88	(0.20) 0.20	MADE GROUND: Dark brown silty gravelly SAND with frequent rootlets, occasional brick fragments and pottery. Sad is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone.		
					(1.80)	Firm to stiff consistency brown and grey mottled sandy CLAY. Sand is fine to coarse. Becoming hard and friable with depth.		
				57.08	2.00	Complete at 2.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP114

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		Site Collyhurst Village, Manchester	Trial Pit Number **TP115**
Machine : JCB 3CX Method :	Dimensions	Ground Level (mOD) 57.97	Client Far East Consortium International Limited	Job Number LKC 20 1120
	Location 385560.1 E 400293.9 N	Dates 13/07/2020	Project Contractor D&I	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-1.00 -2.00 0.05-0.20 0.20-1.20	PP 196kPa PP 211kPa D1 D2			57.92	0.05	MADE GROUND: Grass over concrete paving slabs.		
				57.77	(0.15) 0.20	MADE GROUND: Brown gravelly SAND with occasional ash and brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(2.20)	Stiff consistency brown and grey mottled sandy CLAY. Sand is fine to coarse.		
				55.57	2.40	Complete at 2.40m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP115

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Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site
Collyhurst Village, Manchester

Trial Pit Number
TP116

Machine : JCB 3CX

Method :

Dimensions

Ground Level (mOD)
56.83

Client
Far East Consortium International Limited

Job Number
LKC 20 1120

Location
385608.5 E 400283.5 N

Dates
13/07/2020

Project Contractor
D&I

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.30)	MADE GROUND: Brown silty gravelly SAND with occasional ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded. A brick wall is present in the north of the trial pit from 1.40mbgl to 2.50mbgl.		
				54.53	2.30 (0.20)	MADE GROUND: Whole brick and fragments.		
				54.33	2.50 (1.10)	MADE GROUND: Firm consistency sandy CLAY with occasional pottery, brick fragments and oyster shells. Sand is fine to coarse.		
				53.23	3.60	Complete at 3.60m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP116

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Machine : JCB 3CX **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 56.17	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385632.8 E 400275.8 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	D1				(0.20)	MADE GROUND: Brown silty SAND with frequent rootlets, rare brick fragments and pottery. Sand is fine to coarse.		
0.20-1.20	D2			55.97	0.20	MADE GROUND: Black and orangish brown gravelly SAND of predominantly ash and clinker with occasional brick fragments, concrete tarmac, pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded. Fewer bricks with depth.		
					(3.40)			
3.60-3.70	D3			52.57	3.60	MADE GROUND: Grey very clayey gravelly SAND with frequent ash, clinker and occasional pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded. Moderate organic "bottom of pond" odour.		
				52.47	3.70	Complete at 3.70m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP117

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.60	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385543.5 E 400288.9 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-1.00 -2.00 0.20	PP 206kPa PP 221kPa D1			58.40	(0.20) 0.20	MADE GROUND: Brown silty SAND with frequent rootlets, rare brick fragments and pottery. Sand is fine to coarse.		
					(0.80)	MADE GROUND: Dark brown gravelly SAND with frequent brick fragments, occasional whole brick, pottery and rare pieces of clay. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
1.00-2.00	DB2			57.60	1.00	Firm to stiff consistency brown sandy CLAY with occasional sand lenses. Hard and friable with depth.		
					(1.30)			
				56.30	2.30	Complete at 2.30m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP118

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 57.01	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385577.5 E 400269.1 N	**Dates** 15/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.10	D1			56.91	0.10	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(0.30)			
0.40-0.80	D2			56.61	0.40	MADE GROUND: Brown sandy CLAY with occaisonal brick fragments. Sand is fine to coarse.		
				56.51	0.50			
					(0.30)	MADE GROUND: Cobbled setts of sandstone with coal tar inbetween.		
				56.21	0.80			
1.00-2.00	D3					MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
						MADE GROUND: Brown gravelly SAND with occasional brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(2.80)			
3.60-4.00	D4			53.41	3.60	MADE GROUND: Soft consistency sandy CLAY with occasional brick fragments. Sand is fine to coarse.		
					(0.40)			
				53.01	4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP119

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.08	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385622 E 400257.3 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.80	D1			55.98	0.10	MADE GROUND: Brown silty SAND with frequent rootlets and rare glass fragments. Sand is fine to coarse.		
					(0.70)	MADE GROUND: Grey gravelly SAND with frequent brick fragments, concrete fragments and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
0.80-2.20	D2			55.28	0.80	Black and orange gravelly SAND of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(1.40)			
2.20-3.20	D3			53.88	2.20	MADE GROUND: Brown sandy gravelly CLAY with occasional brick fragments, pottery and occasional black organic rich inclusions. Slight organic "bottom of pand" odour.		
					(1.60)			
				52.28	3.80	Complete at 3.80m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP120

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.84	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385678.8 E 400251.1 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	MADE GROUND: Brown silty SAND with frequent rootlets.		
				56.64	0.20	Sand is fine to coarse.		
0.20-1.10	D1					MADE GROUND: Brown gravelly SAND with frequent brick fragments, concrete fragments and rare metal. Sand is fine to coarse. Gravel is fine to coarse, subangular. Concrete predominantly at the top of the strata.		
					(0.90)			
				55.74	1.10			
				55.64	1.20	MADE GROUND: Firm consistency brown CLAY.		
1.20-2.20	D2					MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with occasional pottery smoking pipes. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(2.40)			
				53.24	3.60	Complete at 3.60m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP121

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.63	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385633.5 E 400237.2 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-0.50 0.00-0.30	ACM D1			55.33	(0.30) 0.30	MADE GROUND: Brown slightly gravelly silty SAND with frequent rootlets and rare concrete fragments. Sand is fine to coarse.		
0.30-0.80	D2			54.83	(0.50) 0.80	MADE GROUND: Brown gravelly SAND with frequent brick fragments, concrete fragemnts, rare timber and slates. Sand is fine to coarse. Gravel is fine to coarse, subangular. Potential ACM encountered at 0.50mbgl.		
0.80-1.80	D3				(2.90)	MADE GROUND: Black gravelly SAND of predominantly ash and clinker with occasional brick fragments, rare metal, pottery and timber. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				51.93	3.70	Complete at 3.70m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP122

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.99	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385661.7 E 400235.2 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND: Brown silty gravelly SAND with frequent rootlets, rare brick fragments and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
0.30-0.90	D2			55.69	0.30	MADE GROUND: Brown and grey gravelly SAND with frequent whole brick and fragments, rare plastic and metal. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(0.60)			
1.00-2.00	D3			55.09	0.90	MADE GROUND: Black SAND and GRAVEL of predominantly ash and clinker with occasional oyster shells and rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(2.20)			
3.10-3.40	D4			52.89	3.10	MADE GROUND: Soft consistency black sandy CLAY with occasional pottery fragments and plant remains. Sand is fine to coarse. Moderate organic "bottom of pond" odour.		
					(0.30)			
				52.59	3.40	Complete at 3.40m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP123

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.75	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385545.8 E 400248.7 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 0.10-1.10	PP 42kPa D1			56.65	0.10	MADE GROUND: Brown gravelly SAND with frequent rootlets and occasional ash. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(1.90)	MADE GROUND: Predominantly whole bricks with brown gravelly SAND with occasional ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
2.00-2.50	DB2			54.75	2.00	Soft consistency sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium, subrounded. Potentially reworked.		
					(0.50)			
				54.25	2.50	Complete at 2.50m		

Remarks

Trial pit collapse at 2.50mbgl.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP124

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP125**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.85	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385606.9 E 400233.5 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.30	D1				(0.30)	MADE GROUND: Brown sandy SILT with frequent rootlets and occasional brick fragments. Sand is fine to coarse.		
				55.55	0.30			
0.30-1.20	D2					MADE GROUND: Brown and grey very clayey sandy GRAVEL with frequent pottery, whole brick and fragments. Occassional tarmac. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(0.90)			
				54.65	1.20			
					(0.20)	MADE GROUND: Sandstone Slab.		
				54.45	1.40			
1.40-1.70	D3				(0.30)	MADE GROUND: Black gravelly SAND of predomiantly ash and clinker with occasional whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				54.15	1.70			
					(0.40)	MADE GROUND: Brown CLAY with rare ash.		
				53.75	2.10			
						MADE GROUND: Black gravelly SAND of predominantly ash and clinker with occasional whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(1.60)			
				52.15	3.70			
						Complete at 3.70m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP125

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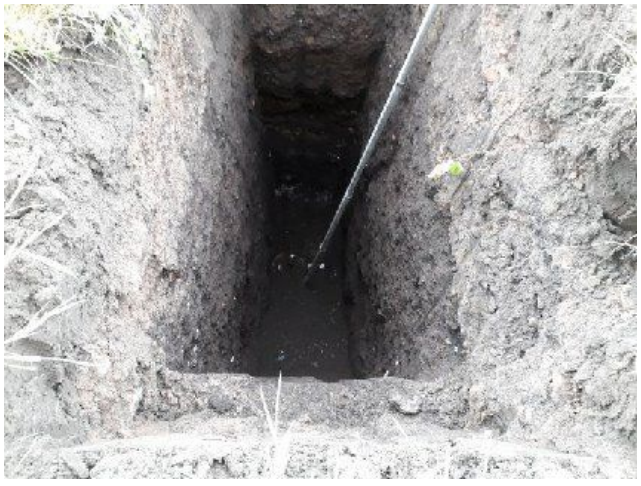
LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP126**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.01	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385651.8 E 400214.8 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND: Dark brown silty SAND with frequent rootlets and occasional brick fragments. Sand is fine to coarse.		
0.30-0.70	D1			55.71	0.30			
					(0.40)	MADE GROUND: Brown gravelly Sand with occasional clay inclusions, whole brick and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
0.70-1.70	D2			55.31	0.70			
						MADE GROUND: Black SAND and GRAVEL of predominantly ash and clinker with occasional brick fragments, pottery, oyster shells and smoking pipe stems. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
2.00-3.00	D3				(3.10)			
				52.21	3.80	Complete at 3.80m		



Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP126

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP127**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.07	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385570.7 E 400231.3 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-1.10	DB1			54.97	0.10	MADE GROUND: Grass over sandstone cobbled setts with coal tar.		
					(1.40)	MADE GROUND: Grey slightly gravelly SAND with rare pottery and glass. Sand is fine to coarse. Gravel is fine, subrounded. Very light, looks and feels like fly ash.		
				53.57	1.50	MADE GROUND: Grey to black gravelly SAND of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded. The above strata grades slowly into this one becomming more ash rich with depth.		
3.00-4.00	D2				(2.50)			
				51.07	4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP127

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP128**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.81	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385513.9 E 400207.2 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-1.00 -2.00 0.00-0.50	PP 113kPa PP 176kPa D1				(0.50)	MADE GROUND: Grey clayey GRAVEL. Gravel is fine to coarse, subangular of limestone.		
0.50-0.90	D2			55.31	0.50 (0.40)	MADE GROUND: Dark brown clayey gravelly SAND with frequent ash and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
0.90-1.90	DB3			54.91	0.90	Firm consistency brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to medium, subrounded of quartz and sandstone. Becoming hard and sandy with depth.		
					(1.50)			
				53.41	2.40	At 2.30mbgl a pottery pipe is present along the western wall of the trial pit within reworked clay.		
						Complete at 2.40m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP128

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP129**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.91	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385529 E 400207.6 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-1.00 0.10-1.00	PP 117kPa D1			55.81	0.10	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(0.90)	MADE GROUND: Black gravelly SAND with frequent ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded. Very compacted.		
1.00-1.90	DB2			54.91	1.00	Firm consistency brown and grey mottled sandy CLAY. Sand is fine to coarse.		
					(0.90)			
1.90-2.30	B3			54.01	1.90	Brown clayey SAND. Sand is fine to coarse. Very hard and recovered as gravel to cobble sized lumps. Possible weathered bedrock.		
					(0.40)			
				53.61	2.30	Complete at 2.30m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP129

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP130**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.63	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385526.1 E 400183.3 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	D1				(1.20)	MADE GROUND: Brown slightly clayey gravelly SAND with frequent brick fragments, concrete, occasional ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
1.20-2.00	D2			54.43	1.20			
					(0.80)	MADE GROUND: Brown clayey very gravelly SAND with frequent whole brick and fragments, concrete, occasional slates, ash and rare glass. Sand is fine to coarse. Gravel is ifne to coarse, subangular to subrounded.		
				53.63	2.00			
					(0.30)	MADE GROUND: Light grey slightly clayey GRAVEL. Gravel is ifine to coarse, angular of limestone. At 2.00mbg a cable was encountered in the east of the pit.		
				53.33	2.30			
3.00-4.00	D3				(1.70)	MADE GROUND: Brown clayey gravelly SAND with occasional whole brick and fragments, concrete and slates. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.		
				51.63	4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP130

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Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.23	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385544.7 E 400185.9 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	D1				(0.40)	MADE GROUND: Black gravelly SAND with frequent ash and clinker, occasional brick fragments and cobbles of sandstone with coal tar. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
0.40-1.40	D2			54.83	0.40	MADE GROUND: Brown silty SAND with occasional pottery and rare brick fragments. Sand is fine to coarse.		
					(2.60)			
3.00-4.00	D3			52.23	3.00	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with occasional oyster shells, cockles, smoking pipes and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(1.00)			
				51.23	4.00	Complete at 4.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP131

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP132**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 54.48	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385493.3 E 400165.6 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	D1				(2.80)	MADE GROUND: Dark brown gravelley SAND with occasional brick fragments, concrete, pottery, rare metal, timber and concrete oversize. Sand is fine to coarse. Gravel is fine to coarse. Subangular to subrounded.		
				51.68	2.80	At 2.40mbgl in the east of the pit White sandy GRAVEL. Sand fine to coarse. Gravel fine to medium, subangular of limestone. At 2.80mbgl a pipe was uncovered within the gravel in the east of the pit.		
						Complete at 2.80m		

Remarks

Trial pit terminated at 2.80mbgl to prevent damage to pipe.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP132

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TP133**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.34	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385526.9 E 400136.8 N	**Dates** 14/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
-2.00 0.00-1.00	PP 74kPa D1				(1.70)	MADE GROUND: Grey brown clayey gravelly SAND with occasional whole brick and fragments. Concrete slab present at 1.00mbgl in the north of the trial pit.		
1.70-2.30	DB2			53.64	1.70	Stiff consistency orange slightly sandy CLAY. Sand is fine to coarse.		
					(0.60)			
				53.04	2.30	Complete at 2.30m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TP133

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR101A**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 54.93	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385573.1 E 400215.4 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.80)	MADE GROUND: Brown gravelly SAND with frequent whole brick and fragments and occasional concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				54.13	0.80			
					(1.00)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with occasional oyster shells. Sand is fine to coarse. gravel is fine to coarse, subangular to subrounded.		
				53.13	1.80			
					(1.70)	Firm brown CLAY with rare black silty organic inclusions.		
				51.43	3.50			
						Complete at 3.50m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR101

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR101B**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.18	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385568.7 E 400213.8 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND: Brown gravelly SAND with occasional brick fragments and concrete. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				54.78	0.40			
					(0.20)	MADE GROUND: CONCRETE. 10mm diameter rebar at 0.55mbgl.		
				54.58	0.60			
					(0.30)	MADE GROUND: Light grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				54.28	0.90	Firm consistency brown CLAY.		
					(2.60)			
				51.68	3.50	Complete at 3.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR101B

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR101C**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.32	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385565.3 E 400213.9 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				55.02	(0.30) 0.30	MADE GROUND: Grey gravelly SAND with occasional brick and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(3.20)	MADE GROUND: Brown sandy CLAY with occasional whole brick and fragments. Sand is fine to coarse.		
				51.82	3.50	Complete at 3.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR101C

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** TR102A
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.25	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385587.5 E 400252.8 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.50)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional whole brick and fragments. Sand is fine to coarse. gravel is fine to coarse, subangular.		
				54.75	1.50	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(1.50)			
				53.25	3.00	Complete at 3.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR102A

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR102B**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.96	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385583.5 E 400254.5 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.50)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional whole brick and fragments. Sand is fine to coarse. gravel is fine to coarse, subangular.		
				54.46	1.50	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
					(1.00)			
				53.46	2.50	MADE GROUND: Firm consistency brown CLAY with rare brick fragments.		
					(0.50)			
				52.96	3.00	Complete at 3.00m		

Remarks

4.30m west from start of pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR102B

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** TR102C
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.25	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385581.5 E 400255.4 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.50)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional whole brick and fragments. Sand is fine to coarse. gravel is fine to coarse, subangular.		
				54.75	1.50			
					(0.50)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				54.25	2.00			
					(1.00)	MADE GROUND: Firm consistency brown CLAY with rare brick fragments.		
				53.25	3.00			
						Complete at 3.00m		

Remarks

6.60m west from start of pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR102C

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR102D**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.25	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385580.1 E 400255.9 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.50)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				54.75 54.75	1.50 1.50	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional whole brick and fragments. Sand is fine to coarse. gravel is fine to coarse, subangular. MADE GROUND: Firm consistency brown CLAY with rare brick fragments.		
					(1.50)			
				53.25	3.00	Complete at 3.00m		

Remarks

8.00m west from start of pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR102D

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR102E**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 56.47	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385575.2 E 400257.9 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.20)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare pottery fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				55.27	1.20			
					(0.30)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional whole brick and fragments. Sand is fine to coarse. gravel is fine to coarse, subangular.		
				54.97	1.50	MADE GROUND: Firm consistency brown CLAY with rare brick fragments.		
					(1.50)			
				53.47	3.00	Complete at 3.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR102E

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR103A**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Trial Pit		56.97	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385594.2 E 400284.2 N	21/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.30)	MADE GROUND: Black gravelly SAND of predominantly ash and clinker with occasional pottery, sandstone slabs, whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				55.67	1.30			
					(1.20)	MADE GROUND: Firm consistency brown sandy gravelly CLAY with occasional brick fragments, pottery, rare cobbles, coal, bone, cockle and muscle shells. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				54.47	2.50			
					(1.50)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with rare oyster shells, smoking pipes and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				52.97	4.00	Complete at 4.00m		

Remarks

Scale (approx)	**Logged By**	**Figure No.**
1:40	PW	LKC 20 1120.TR103A

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR103B**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 57.40	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385590.3 E 400295.6 N	**Dates** 21/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				57.25	(0.15) 0.15	MADE GROUND: Brown silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse.		
					(1.85)	Firm brown and grey mottled CLAY.		
				55.40	2.00	Complete at 2.00m		

Remarks

3.90m east from the edge of the trench ash appears beneath the topsoil becomming thicker further to the east.
5.10m east from the edge of the trial pit the ash is present to 1.10mbgl over the natural clay.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR103B

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR104A**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.52	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385590.8 E 400332.4 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				58.32	(0.20) 0.20	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(0.70)	MADE GROUND: Brown gravelly SAND with occasional tarmacadam, ash, brick fragments and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				57.62	0.90	Firm consistency brown CLAY. Edge of concrete slab encountered in the west of the trial pit from 0.90m to 1.10mbgl.		
					(1.60)			
				56.02	2.50	Complete at 2.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR104A

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** TR104B	
Excavation Method Trial Pit	**Dimensions**	**Ground Level (mOD)** 58.60	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385596.9 E 400328.7 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				58.40	(0.20) 0.20	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(0.70)	MADE GROUND: Brown gravelly SAND with occasional tarmacadam, ash, brick fragments and pottery. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				57.70	0.90			
					(0.30)	MADE GROUND: Black Sands and Gravel of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				57.40	1.20			
					(1.30)	Firm consistency brown CLAY.		
				56.10	2.50	Complete at 2.50m		

Remarks

The natural clay slopes downwards from beneath the concrete to this poing 1.20mbgl 4.20m to the east of the concrete edge. Beyond this no clay can be seen and instead ash was noted deeper than 2.50mbgl.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR104B

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR105A**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.91	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385604.1 E 400356.1 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.90)	MADE GROUND: Brown gravelly SAND with frequent whole brick and fragments, occasional oversize masonry and concrete. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				58.01	0.90			
					(0.20)	MADE GROUND: CONCRETE.		
				57.81	1.10	Complete at 1.10m		

Remarks

Edge of concrete 7.50m east from start of pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR105A

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR105B**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.91	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385612.1 E 400355.2 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.90)	MADE GROUND: Brown gravelly SAND with frequent whole brick and fragments, occasional oversize masonry and concrete. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				58.01	0.90			
					(0.19)	MADE GROUND: Old TARMACADAM with brick crush.		
				57.82	1.09			
					(0.91)	MADE GROUND: Brown CLAY with rare brick fragments.		
				56.91	2.00			
						Complete at 2.00m		

Remarks

7.40m to 9.00m east from start of pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR105B

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com		**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR105C**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.79	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385613.7 E 400355 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				58.59	(0.20) 0.20	MADE GROUND: Brown gravely SAND with frequent whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
					(0.70)	MADE GROUND: BRICKWORK.		
				57.89	0.90			
					(0.20)	MADE GROUND: CONCRETE. No rebar.		
				57.69	1.10	MADE GROUND: Brown CLAY with rare brick fragments.		
					(0.90)			
				56.79	2.00	Complete at 2.00m		

Remarks

Concrete present from 9.00m to 10.90m east from start of pit.
Brickwork present from 9.10m to 10.60m east from the start of the pit.
Black pipe present half set into the concrete at 0.70mbgl and 10.10m east from the start of the pit.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR105C

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR105D**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 58.74	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385618 E 400354.4 N	**Dates** 20/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				58.64	0.10	MADE GROUND: Brown silty SAND with frequent rootlets. Sand is fine to coarse.		
					(1.30)	MADE GROUND: Brown gravelly SAND with frequent whole brick and fragments, occasional pottery, ash and clinker, pieces of clay and rare oyster shells. Sand is fine to coarse. Gravel is fine to coarse.		
				57.34	1.40	Firm consistency brown and grey mottled sandy CLAY with rare rootlets. Sand is fine to coarse. Potentially reworked in places with rare brick fragments present.		
					(1.60)			
				55.74	3.00	Complete at 3.00m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR105D

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR106**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.07	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385518.9 E 400149.5 N	**Dates** 21/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.10)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional oversize, concrete, metal, whole brick and fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				53.97	1.10			
					(0.90)	MADE GROUND: Brown clayey gravelly SAND with occasional brick fragments and ash. Sand is fine to coarse. Gravel is fine to coarse, subangular of sandstone.		
				53.07	2.00			
					(0.50)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				52.57	2.50	Complete at 2.50m		

Remarks

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR106

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR107**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.52	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385536.9 E 400173.3 N	**Dates** 21/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.00)	MADE GROUND: Black gravelly SAND with occasional whole brick and fragments, rare pottery and metal. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				53.52	2.00			
					(1.80)	MADE GROUND: Black gravelly SAND with frequent ash, brick fragments and rare metal. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				51.72	3.80			
					(0.20)	MADE GROUND: Brown sandy CLAY with rare brick fragments. Sand is fine to coarse.		
				51.52	4.00	Complete at 4.00m		

Remarks

Brick wall encountered in the west of the trench from 2.00mbgl, surrounded by orange sand. Base of the wall not seen at 3.50mbgl.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR107

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LK CONSULT LTD Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Trial Pit Number** **TR108**
Machine : JCB 3CX **Method :**	**Dimensions**	**Ground Level (mOD)** 55.30	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385553.4 E 400200.7 N	**Dates** 21/07/2020	**Project Contractor** D&I	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND: Brown gravelly SAND with frequent rootlets, occasional brick and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular.		
				55.00	0.30			
				54.95	0.35	MADE GROUND: Orange sandy GRAVEL of predominantly brick crush. Sand is fine to coarse. Gravel is fine to coarse, angular.		
					(3.15)	MADE GROUND: Black SANDS and GRAVEL of predominantly ash and clinker with occasional whole brick and fragments, rare oyster shells and smoking pipes present with depth. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.		
				51.80	3.50	Complete at 3.50m		

Remarks

2.10m west from the edge of the pit a cable is present at 0.30mbgl.
2.30m west from the edge of the pit a gas pipe present at 0.30mbgl.
9.40m west from the edge of the pit a pipe is present at 0.60mbgl.
9.60m west from the edge of the pit a water pipe is present at 0.70mbgl.
10.00m west from the edge of the pit a cable is present at 0.50mbgl.
10.20m west from the edge of the pit a gas pipe present at 0.30mbgl.
1.00m west from the edge of the pit a water pipe is present at 0.60mbgl.
1.10m west from the edge of the pit a cable within a duct is present at 0.60mbgl.

Scale (approx)	Logged By	Figure No.
1:40	PW	LKC 20 1120.TR108

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		59.47	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385563.4 E 400337.9 N	13/07/2020	D&I	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(0.70)	MADE GROUND: Dark brown slightly silty gravelly SAND with occasonal rootlets, brick fragments and rare coal. Sand is fine to medium. Gravel is fine to medium and subangular compising mudstone.			
					58.77	0.70				
1.00	D2					(0.50)	MADE GROUND: Brown slightly gravelly slightly sandy CLAY with occional ash and rare clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone and mudstone.			
1.20-1.65	SPT N=17			2,3/4,4,3,6	58.27	1.20				
1.20-1.65	X3						Stiff to very stiff consistency brown slightly gravelly sandy silty CLAY with rare coal fragments. Sand is fine to medium. Gravel is fine to coarse and subangular to subrounded comprising sandstone and mudstone.			
1.40-1.70	B4									
2.10-2.55	U5									
2.60	D6									
3.20-3.65	SPT N=23			2,4/5,5,6,7						
3.20-3.65	S7									
						(5.20)				
4.20-4.65	U8									
4.70	D9									
5.00-5.30	B10									
5.40-5.85	SPT N=43			8,9/10,10,11,12						
5.40-5.85	X11									
6.40-6.59	SPT 50/40			20,5/33,17	53.07	6.40	Very stiff consistency brown slightly sandy CLAY. Sand is fine to medium.			
6.40-6.60	X12									
						(1.60)				
7.50-7.70	SPT 50/50			18,7/28,22						
7.50-7.70	X13									

Remarks
Borehole dry.
Chiselling from 6.40m to 10.00m for 3.5 hours.

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH1

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		59.47	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385563.4 E 400337.9 N	13/07/2020	D&I	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
8.00-8.30	B14				51.47	8.00	Very stiff consistency brown slightyl gravelly CLAY. Gravel is fine to medium and subangular comprising sandstone.			
8.40-8.77 8.40-8.80	SPT 50/220 B15			10,10/14,16,20		(2.00)				
9.20-9.55 9.20-9.55	SPT 50/200 X16			10,12/14,20,16						
10.00-10.30 10.00-10.30	SPT 50/150 X17			10,14/21,29	49.47	10.00	Brown SANDSTONE.			
						(0.30)				
					49.17	10.30	Complete at 10.30m			

Remarks
Borehole dry.

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH1

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH2**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		57.21	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385599.9 E 400284.7 N	13/07/2020	D&I	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(0.90)	MADE GROUND: Black gravelly silty SAND with occasional ash, clinker, rare pottery fragments and coal fragments. Sand is fine to medium. Gravel is fine to medium and subangular comprising mudstone.			
					56.31	0.90				
1.00	D2						MADE GROUND: Brown gravelly sandy silty CLAY with occasional brick fragments, ash, rare clinker. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone and mudstone.			
1.20-1.65	SPT N=7			1,2/2,2,1,2						
1.20-1.65	X3									
2.00-2.54	X4									
2.50-2.80	B5					(3.40)				
3.30-3.75	SPT N=4			2,2/1,1,1,1						
3.30-3.75	X6									
					52.91	4.30				
4.40-4.85	SPT N=24			4,5/6,6,6,6			Stiff to very stiff consistency brown slightly gravelly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium and subangular comprising sandstone.			
4.40-4.85	X7									
5.00-5.30	B8									
5.50-5.95	UB9					(2.40)				
					50.51	6.70				
6.90-7.30	SPT 50/250			5,10/12,13,15,10			Very stiff consistency brown slightly gravelly CLAY. Gravel is fine to medium and subangular comprising mudstone.			
6.90-7.30	X10					(0.80)				
7.30-7.50	B11									
7.50-7.70	SPT 50/50			18,7/28,22	49.71	7.50	Grey and brown shaley MUDSTONE.			
7.50-7.70	X12									
7.80	D13									

Remarks
Borehole dry.
Chiselling from 6.90m to 8.50m for 1.5 hours.

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH2

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH2**
Boring Method Cable Percussion	**Casing Diameter**	**Ground Level (mOD)** 57.21	**Client** Far East Consortium International Limited	**Job Number** LKC 20 1120
	Location 385599.9 E 400284.7 N	**Dates** 13/07/2020	**Project Contractor** D&I	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						(1.20)				
8.50-8.70 8.50-8.70	SPT 50/50 X14			20,5/32,18	48.51	8.70	Complete at 8.70m			

Remarks
Borehole dry.

Scale (approx)	Logged By
1:40	JH

Figure No.
LKC 20 1120.BH2

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Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		57.50	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385529.9 E 400259 N	13/07/2020	D&I	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(0.50)	MADE GROUND: Blackish brown gravelly silty SAND with occasional rootlets and rare brick fragments. Sand is fine to medium. Gravel is fine to coarse and rounded to angular comprising sandstone and mudstone.			
					57.00	0.50				
0.70	D2						Soft to stiff consistency grey and brown slightly gravelly sandy silty CLAY with rare cobbles. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone.			
1.20-1.65	SPT N=22			2,2/4,5,6,7						
1.20-1.65	X3									
1.50-1.80	B4									
2.10-2.55	SPT N=26			4,5/5,6,7,8						
2.10-2.50	X5									
						(3.80)				
2.80-2.90	X6									
3.00-3.30	B7									
3.70-3.95	SPT 50/100			11,14/30,20						
3.70-3.95	X8									
4.30-4.70	SPT 50/250			7,8/14,12,18,6	53.20	4.30	Very stiff brown slightlty gravelly CLAY. Gravel is fine to coarse and subangular comprising sandstone.			
4.30-4.70	X9									
5.00-5.30	B10					(1.60)				
5.50-5.90	SPT 50/250			6,8/11,12,17,10						
5.50-5.90	X11									
					51.60	5.90	Complete at 5.90m			

Remarks
Borehole dry.
Chiselling from 2.80m to 5.50m for 2 hours.

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH3

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH4**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		55.44	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385510.3 E 400189 N	13/07/2020	D&I	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(0.70)	MADE GROUND: Dark brown gravelly clayey SAND with frequent brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded.			
0.80	D2				54.74	0.70	MADE GROUND: Brown gravelly sandy silty CLAY with frequent ash, occasional brick fragments. Sand is fine to medium. Gravel is fine to coarse and subangular comprising sandstone. Less gravel content with depth.			
1.20-1.65	X3									
1.70-2.00	B4									
2.10-2.55	X5									
3.30-3.75	X6									
4.40-4.85	X7					(7.40)				
5.00-5.30	B8									
5.50-5.95	X9									
7.10-7.55	X10									

Remarks

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH4

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LK GROUP	**LK CONSULT LTD** Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS Tel: 0161 763 7200 web: www.thelkgroup.com	**Site** Collyhurst Village, Manchester	**Borehole Number** **BH4**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion		55.44	Far East Consortium International Limited	LKC 20 1120
	Location	**Dates**	**Project Contractor**	**Sheet**
	385510.3 E 400189 N	13/07/2020	D&I	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
8.10-8.55	X11				47.34	8.10	MADE GROUND: Sandstone fill.			
						(2.20)				
9.60-10.05	X12								▼1	
					45.14	10.30			▽1	
10.40-10.65	X13			Fast(1) at 10.30m, rose to 9.70m in 5 mins.			Purple and grey MUDSTONE with sandstone inclusions.			
						(1.20)				
11.30-11.50	X14				43.94	11.50	Complete at 11.50m			

Remarks
Chiselling from 10.30m to 11.30m for 1 hour.

Scale (approx)	**Logged By**
1:40	JH

Figure No.
LKC 20 1120.BH4

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Appendix C

Certificates of Analysis – Soil

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18141-1
Initial Date of Issue:	28-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Chris Hughes Contaminated Land
Project	LKC 20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	15-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	9		
Turnaround (Wkdays):	5	**Results Due:**	28-Jul-2020
Date Approved:	28-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141
Quotation No.:				**Chemtest Sample ID.:**	1031984	1031985	1031986	1031991	1031995	1031998	1031999	1032000	1032001
				Client Sample ID.:	WS15 D1	WS15 D2	WS17 D1	WS18 D2	WS16 D2	WS14B D1	WS14B D2	WS14B D3	WS10 D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.0	0.8	0.6	0.4	1.5	0.4	1.6	4.0	0.0
				Bottom Depth (m):	0.7	1.0	1.0	1.0	1.5	1.0	2.0	4.5	0.3
				Date Sampled:	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020
				Asbestos Lab:	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-		-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	3.9	9.6	18	14	26	3.8	18	26	19
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Black	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Loam	Sand
Chromatogram (TPH)	N			N/A					See Attached		See Attached		
pH	M	2010		4.0	8.4	8.3	8.1	8.1	7.4	10.7	8.4		7.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40					0.50		1.8		
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010							
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	0.35	0.018	0.039	0.50	< 0.010		< 0.010
Chloride (Water Soluble)	M	2220	g/l	0.010		< 0.010							
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010							
Cyanide (Free)	M	2300	mg/kg	0.50					< 0.50		< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50					5.2		1.5		
Arsenic	M	2450	mg/kg	1.0	18		39	18	140	42	51		18
Cadmium	M	2450	mg/kg	0.10	1.2		0.54	0.29	0.68	0.63	0.77		1.5
Chromium	M	2450	mg/kg	1.0	4.4		16	22	33	33	24		290
Copper	M	2450	mg/kg	0.50	6.8		130	48	210	77	340		74
Mercury	M	2450	mg/kg	0.10	< 0.10		1.6	0.40	11	0.87	2.2		0.76
Nickel	M	2450	mg/kg	0.50	11		31	23	88	32	39		22
Lead	M	2450	mg/kg	0.50	29		430	300	600	470	500		250
Selenium	M	2450	mg/kg	0.20	< 0.20		0.60	0.36	1.4	< 0.20	0.75		0.58
Vanadium	U	2450	mg/kg	5.0	5.5		38	26	97	37	38		18
Zinc	M	2450	mg/kg	0.50	45		250	150	420	200	280		190
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50
Organic Matter	M	2625	%	0.40	3.5		6.9	3.8	38	5.0	22	13	4.8
Fuel Type	N	2670		N/A					N/A		PAH	PAH	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0		1.4	< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0		29	4.7	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0					< 1.0		84	8.6	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0					< 1.0		100	15	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0					< 1.0		230	77	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0					< 1.0		120	37	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

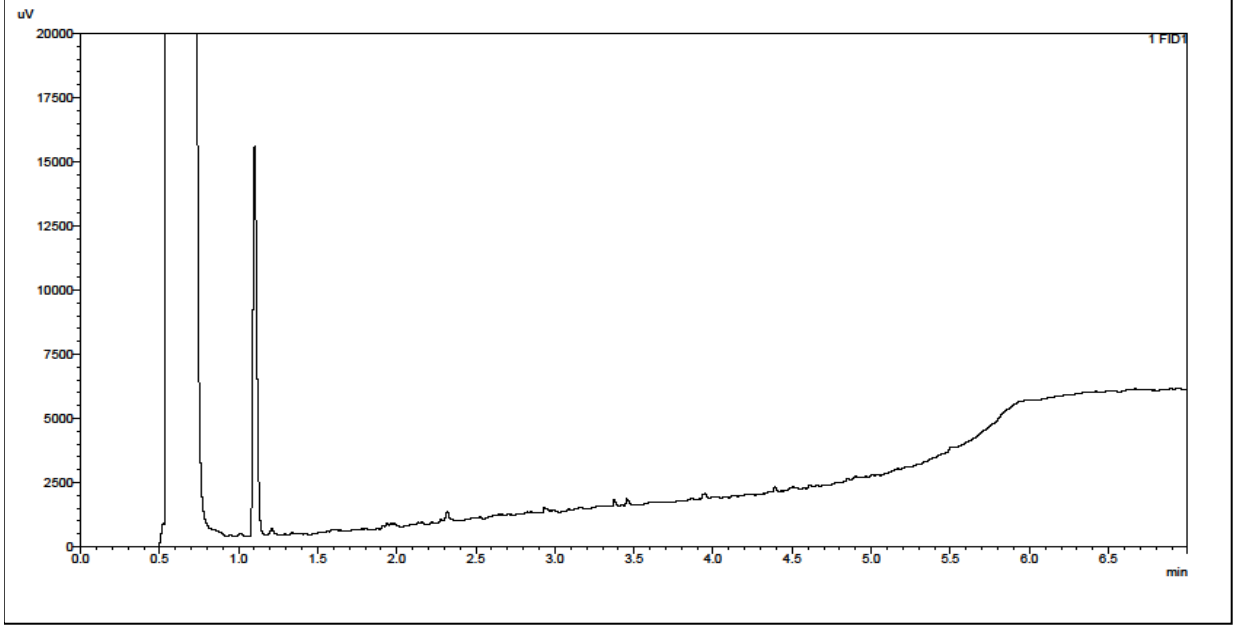
Client: LK Consult			**Chemtest Job No.:**		20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141
Quotation No.:			**Chemtest Sample ID.:**		1031984	1031985	1031986	1031991	1031995	1031998	1031999	1032000	1032001
			Client Sample ID.:		WS15 D1	WS15 D2	WS17 D1	WS18 D2	WS16 D2	WS14B D1	WS14B D2	WS14B D3	WS10 D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.0	0.8	0.6	0.4	1.5	0.4	1.6	4.0	0.0
			Bottom Depth (m):		0.7	1.0	1.0	1.0	1.5	1.0	2.0	4.5	0.3
			Date Sampled:		13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020
			Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0					< 5.0		570	140	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0		23	< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0		88	14	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0					< 1.0		600	110	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0					< 1.0		2000	500	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0					< 1.0		6400	1800	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0					< 1.0		410	85	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0					< 5.0		9500	2500	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0					< 10		10000	2600	
Benzene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Toluene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Naphthalene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.69	< 0.10	0.27	13		0.76
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.29	< 0.10	0.12	6.0		0.12
Acenaphthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	1.5	< 0.10	0.25	110		2.8
Fluorene	M	2800	mg/kg	0.10	< 0.10		< 0.10	1.4	< 0.10	0.16	66		1.9
Phenanthrene	M	2800	mg/kg	0.10	0.16		< 0.10	12	1.5	2.2	450		11
Anthracene	M	2800	mg/kg	0.10	0.12		< 0.10	3.5	0.34	0.50	120		2.9
Fluoranthene	M	2800	mg/kg	0.10	0.26		< 0.10	19	2.5	4.2	510		13
Pyrene	M	2800	mg/kg	0.10	0.25		< 0.10	17	2.7	4.0	430		11
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.18		< 0.10	8.5	1.6	2.2	190		5.7
Chrysene	M	2800	mg/kg	0.10	0.20		< 0.10	7.7	1.5	2.1	190		5.3
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.26		< 0.10	10	2.4	3.2	210		6.8
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	3.9	0.72	1.1	79		2.3
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.18		< 0.10	9.2	2.0	2.9	170		5.7
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.20		< 0.10	6.6	1.7	2.3	86		4.0
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.12		< 0.10	1.1	0.36	0.39	23		0.74
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.11		< 0.10	4.7	1.3	1.6	100		3.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.0		< 2.0	110	19	28	2800		77
Total Phenols	M	2920	mg/kg	0.30					< 0.30		< 0.30		

TPH Chromatogram on Soil Sample: 1031995

<Sample Information>

Sample Name : 1031995 20-18141
Data Filename : 24 July 2020_24072020_1031995 20-18141_075.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 38
Date Acquired : 24/07/2020 22:28:22
Date Processed : 24/07/2020

<Chromatogram>

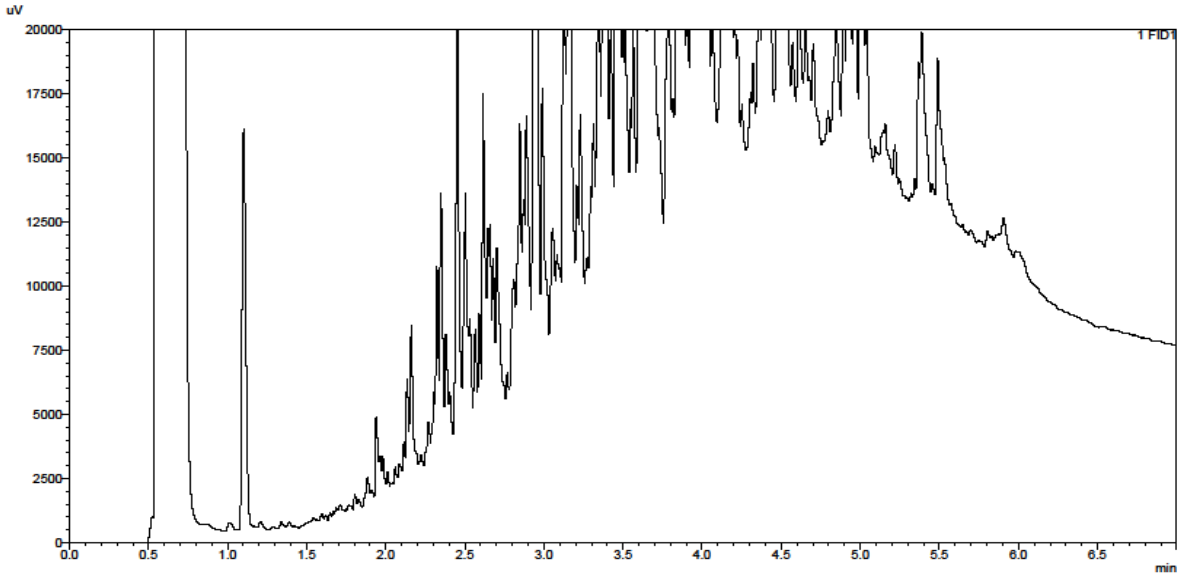


TPH Chromatogram on Soil Sample: 1031999

<Sample Information>

Sample Name : 1031999 20-18141
Data Filename : 24 July 2020_24072020_1031999 20-18141_077.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 39
Date Acquired : 24/07/2020 22:40:54
Date Processed : 24/07/2020

<Chromatogram>



Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18300-1
Initial Date of Issue:	28-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Contaminated Land Paul Quimby
Project	LKC 20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	16-Jul-2020
Order No.:	737856	**Date Instructed:**	22-Jul-2020
No. of Samples:	10		
Turnaround (Wkdays):	5	**Results Due:**	28-Jul-2020
Date Approved:	28-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Bulk Identification Certificate

Client: LK Consult

Site Address:

Date Sampled: 14-Jul-2020

Date Received: 16-Jul-2020

Your Ref.:

Project: LKC 20 1120 Rochdale Road, Collyhurst

Job Number: 20-18300

No Samples:

Date Reported: 28-Jul-2020

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1032752			TP122/ACM	0.50		2185	U	COVENTRY	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).
The results relate only to items tested as supplied by the client.
Comments and interpretations are beyond the scope of UKAS accreditation.
Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300
Quotation No.:				**Chemtest Sample ID.:**	1032741	1032743	1032747	1032750	1032753	1032757	1032760	1032762	1032764
				Sample Location:	TP117/D2	TP120/D1	TP125/D2	TP122/D2	TP126/D1	TP123/D2	TP121/D1	TP129/D1	TP133/D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.20	0.10	0.30	0.30	0.30	0.30	0.20	0.10	0.00
				Bottom Depth (m):	1.20	0.80	1.20	0.80	0.70	0.90	1.10	1.00	1.00
				Date Sampled:	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	18	12	11	11	12	13	11	16	16
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A	See Attached						See Attached		
pH	M	2010		4.0	9.0	9.4	9.4	9.6	8.5	10.6	10.4	8.4	8.4
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.97						0.62		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.13	0.069	0.036	0.21	< 0.010	0.42	0.87	0.46	< 0.010
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50						< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50	2.3						< 0.50		
Arsenic	M	2450	mg/kg	1.0	50	22	24	22	41	34	16	37	14
Cadmium	M	2450	mg/kg	0.10	1.2	0.58	0.49	0.71	0.74	0.33	0.27	0.34	0.66
Chromium	M	2450	mg/kg	1.0	20	28	17	75	27	20	16	20	29
Copper	M	2450	mg/kg	0.50	220	64	53	57	250	78	32	140	51
Mercury	M	2450	mg/kg	0.10	1.3	0.53	0.26	0.53	1.2	0.73	0.53	0.70	0.49
Nickel	M	2450	mg/kg	0.50	57	19	21	22	36	23	18	58	23
Lead	M	2450	mg/kg	0.50	490	240	120	210	260	230	130	170	170
Selenium	M	2450	mg/kg	0.20	1.1	< 0.20	< 0.20	0.32	0.33	< 0.20	0.41	1.6	0.25
Vanadium	U	2450	mg/kg	5.0	35	24	20	22	29	29	18	56	25
Zinc	M	2450	mg/kg	0.50	200	120	100	180	200	89	55	82	110
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	24	2.9	5.5	4.7	7.1	4.8	3.1	38	5.2
Fuel Type	N	2670		N/A	PAH						PAH		
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	130						< 1.0		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	130						< 5.0		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0						< 1.0		

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

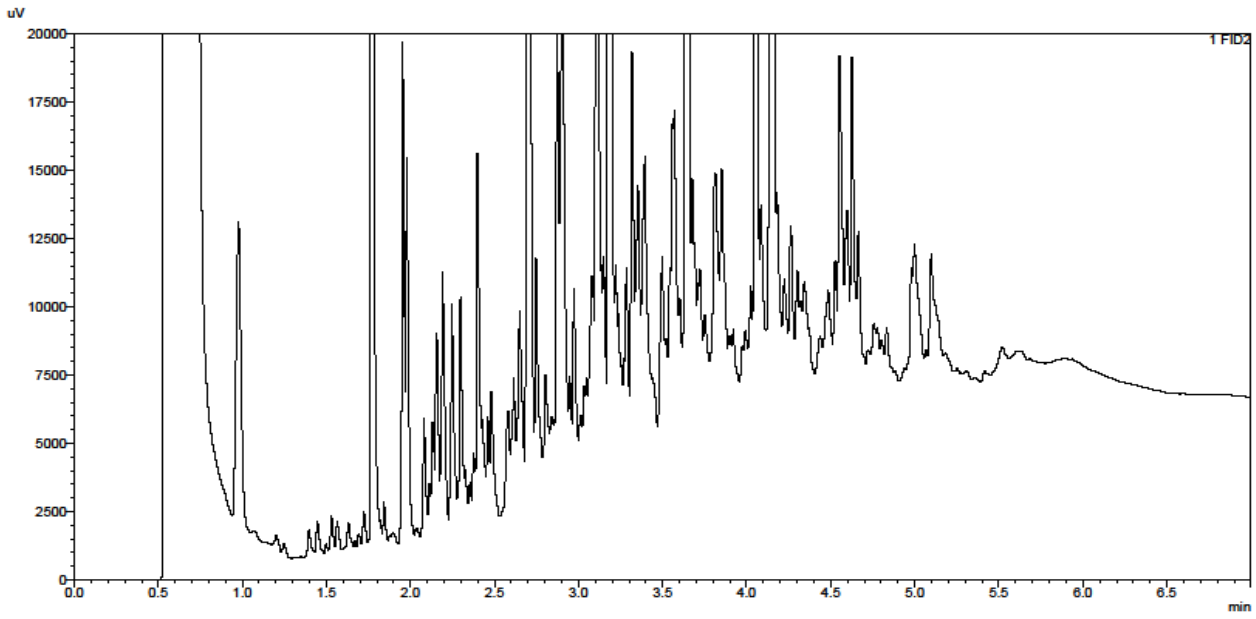
Client: LK Consult			**Chemtest Job No.:**		20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300
Quotation No.:			**Chemtest Sample ID.:**		1032741	1032743	1032747	1032750	1032753	1032757	1032760	1032762	1032764
			Sample Location:		TP117/D2	TP120/D1	TP125/D2	TP122/D2	TP126/D1	TP123/D2	TP121/D1	TP129/D1	TP133/D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.10	0.30	0.30	0.30	0.30	0.20	0.10	0.00
			Bottom Depth (m):		1.20	0.80	1.20	0.80	0.70	0.90	1.10	1.00	1.00
			Date Sampled:		14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	110						< 1.0		
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	240						< 1.0		
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	920						10		
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	2800						< 1.0		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	65						< 1.0		
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	4200						10		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	4300						10		
Benzene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Toluene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
o-Xylene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Naphthalene	M	2800	mg/kg	0.10	19	0.31	1.7	0.52	2.6	0.36	< 0.10	1.2	1.3
Acenaphthylene	N	2800	mg/kg	0.10	3.1	0.13	4.0	0.17	0.41	0.18	< 0.10	0.55	0.47
Acenaphthene	M	2800	mg/kg	0.10	7.5	0.54	3.5	0.64	0.98	0.59	< 0.10	1.0	1.0
Fluorene	M	2800	mg/kg	0.10	8.1	0.41	5.6	0.60	1.2	0.44	< 0.10	1.0	1.0
Phenanthrene	M	2800	mg/kg	0.10	68	5.2	54	5.8	8.8	6.3	1.7	9.4	9.7
Anthracene	M	2800	mg/kg	0.10	15	1.1	13	1.6	1.9	1.4	0.43	2.6	2.0
Fluoranthene	M	2800	mg/kg	0.10	69	8.8	60	8.6	9.0	9.9	2.6	14	14
Pyrene	M	2800	mg/kg	0.10	68	8.0	49	7.2	9.3	9.1	2.6	16	13
Benzo[a]anthracene	M	2800	mg/kg	0.10	39	4.4	28	4.3	4.8	4.4	1.6	14	6.9
Chrysene	M	2800	mg/kg	0.10	34	3.8	22	3.5	4.4	4.1	1.2	12	5.9
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	42	5.2	29	4.6	5.6	5.1	1.8	21	7.9
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	16	1.7	11	1.4	1.9	1.6	0.52	7.8	2.6
Benzo[a]pyrene	M	2800	mg/kg	0.10	43	4.6	29	4.3	5.2	5.1	1.7	25	7.6
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	29	3.3	20	2.8	3.2	3.5	1.2	18	5.8
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	6.1	0.73	3.3	0.53	0.66	0.60	0.27	3.9	0.73
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	23	2.7	14	1.9	2.6	2.3	1.0	16	4.2
Total Of 16 PAH's	N	2800	mg/kg	2.0	490	51	350	49	63	55	17	160	83
Total Phenols	M	2920	mg/kg	0.30	< 0.30						< 0.30		

TPH Chromatogram on Soil Sample: 1032741

<Sample Information>

Sample Name : 1032741 20-18300
Data Filename : 23 July 2020_23072020_1032741 20-18300_044.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 97
Date Acquired : 23/07/2020 19:13:59
Date Processed : 23/07/2020

<Chromatogram>

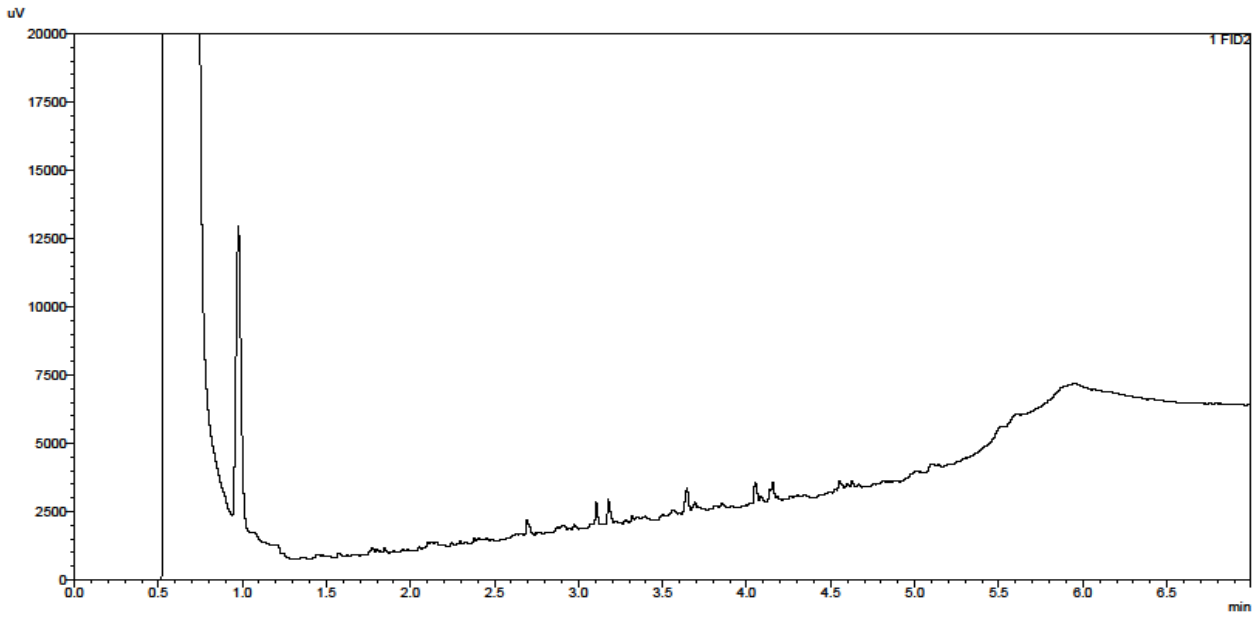


TPH Chromatogram on Soil Sample: 1032760

<Sample Information>

Sample Name : 1032760 20-18300
Data Filename : 23 July 2020_23072020_1032760 20-18300_046.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 98
Date Acquired : 23/07/2020 19:27:09
Date Processed : 23/07/2020

<Chromatogram>



Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	20-18300-2		
Initial Date of Issue:	28-Jul-2020	**Date of Re-Issue:**	03-Sep-2020
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Contaminated Land Paul Quimby		
Project	LKC 20 1120 Rochdale Road, Collyhurst		
Quotation No.:		**Date Received:**	16-Jul-2020
Order No.:	737856	**Date Instructed:**	22-Jul-2020
No. of Samples:	10		
Turnaround (Wkdays):	31	**Results Due:**	03-Sep-2020
Date Approved:	03-Sep-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Bulk Identification Certificate

Client: LK Consult

Site Address:

Date Sampled: 14-Jul-2020

Date Received: 16-Jul-2020

Your Ref.:

Project: LKC 20 1120 Rochdale Road, Collyhurst

Job Number: 20-18300

No Samples:

Date Reported: 28-Jul-2020

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1032752			TP122/ACM	0.50		2185	U	COVENTRY	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).
The results relate only to items tested as supplied by the client.
Comments and interpretations are beyond the scope of UKAS accreditation.
Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Leachate

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**		20-18300
Quotation No.:				**Chemtest Sample ID.:**		1032741
				Sample Location:		TP117/D2
				Sample Type:		SOIL
				Top Depth (m):		0.20
				Bottom Depth (m):		1.20
				Date Sampled:		14-Jul-2020
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
C2 Aliphatic TPH >C5-C6	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C6-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	2:1	µg/l	5.0	< 5.0
C2 Aromatic TPH >C5-C7	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C7-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	< 0.10
C2 Total Aromatic Hydrocarbons	N	1675	2:1	µg/l	5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	2:1	µg/l	10	< 10
Total Organic Carbon	U	1610	2:1	mg/l	2.0	6.8
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	2:1	µg/l	1.0	< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300
Quotation No.:				**Chemtest Sample ID.:**	1032741	1032743	1032747	1032750	1032753	1032757	1032760	1032762	1032764
				Sample Location:	TP117/D2	TP120/D1	TP125/D2	TP122/D2	TP126/D1	TP123/D2	TP121/D1	TP129/D1	TP133/D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.20	0.10	0.30	0.30	0.30	0.30	0.20	0.10	0.00
				Bottom Depth (m):	1.20	0.80	1.20	0.80	0.70	0.90	1.10	1.00	1.00
				Date Sampled:	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
				Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	18	12	11	11	12	13	11	16	16
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A	See Attached						See Attached		
pH	M	2010		4.0	9.0	9.4	9.4	9.6	8.5	10.6	10.4	8.4	8.4
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.97						0.62		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.13	0.069	0.036	0.21	< 0.010	0.42	0.87	0.46	< 0.010
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50						< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50	2.3						< 0.50		
Arsenic	M	2450	mg/kg	1.0	50	22	24	22	41	34	16	37	14
Cadmium	M	2450	mg/kg	0.10	1.2	0.58	0.49	0.71	0.74	0.33	0.27	0.34	0.66
Chromium	M	2450	mg/kg	1.0	20	28	17	75	27	20	16	20	29
Copper	M	2450	mg/kg	0.50	220	64	53	57	250	78	32	140	51
Mercury	M	2450	mg/kg	0.10	1.3	0.53	0.26	0.53	1.2	0.73	0.53	0.70	0.49
Nickel	M	2450	mg/kg	0.50	57	19	21	22	36	23	18	58	23
Lead	M	2450	mg/kg	0.50	490	240	120	210	260	230	130	170	170
Selenium	M	2450	mg/kg	0.20	1.1	< 0.20	< 0.20	0.32	0.33	< 0.20	0.41	1.6	0.25
Vanadium	U	2450	mg/kg	5.0	35	24	20	22	29	29	18	56	25
Zinc	M	2450	mg/kg	0.50	200	120	100	180	200	89	55	82	110
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	24	2.9	5.5	4.7	7.1	4.8	3.1	38	5.2
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0						< 1.0		
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	130						< 1.0		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	130						< 5.0		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0						< 1.0		
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0						< 1.0		

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

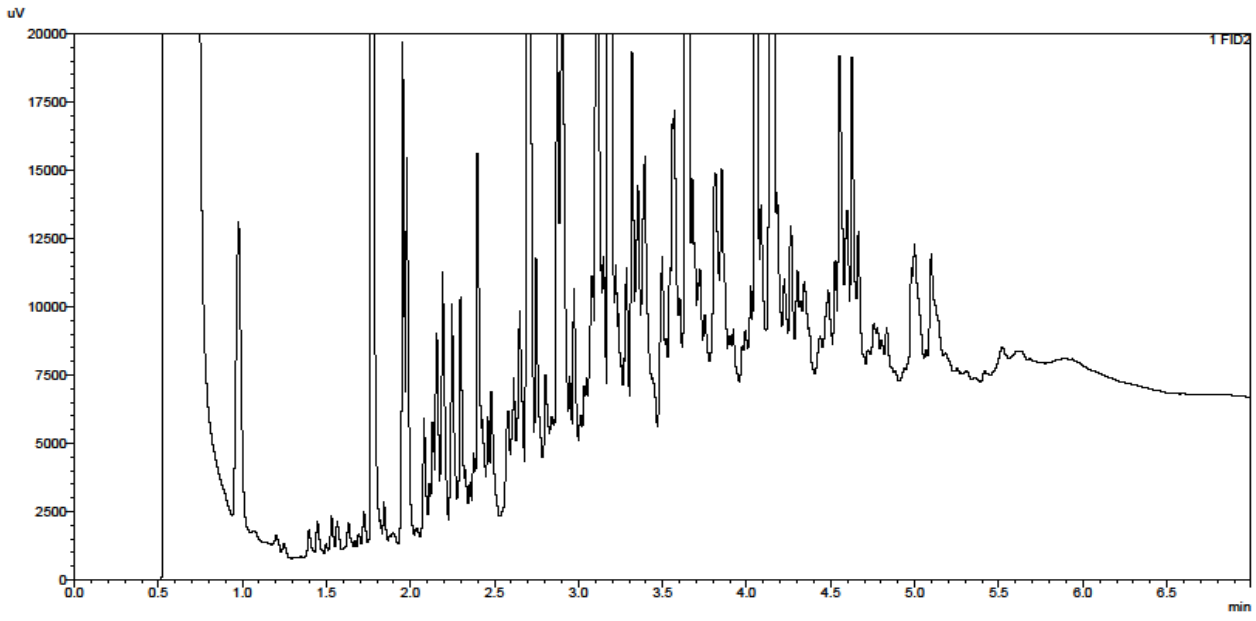
Client: LK Consult			**Chemtest Job No.:**		20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300	20-18300
Quotation No.:			**Chemtest Sample ID.:**		1032741	1032743	1032747	1032750	1032753	1032757	1032760	1032762	1032764
			Sample Location:		TP117/D2	TP120/D1	TP125/D2	TP122/D2	TP126/D1	TP123/D2	TP121/D1	TP129/D1	TP133/D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.10	0.30	0.30	0.30	0.30	0.20	0.10	0.00
			Bottom Depth (m):		1.20	0.80	1.20	0.80	0.70	0.90	1.10	1.00	1.00
			Date Sampled:		14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	110						< 1.0		
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	240						< 1.0		
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	920						10		
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	2800						< 1.0		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	65						< 1.0		
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	4200						10		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	4300						10		
Benzene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Toluene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
o-Xylene	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0						< 1.0		
Naphthalene	M	2800	mg/kg	0.10	19	0.31	1.7	0.52	2.6	0.36	< 0.10	1.2	1.3
Acenaphthylene	N	2800	mg/kg	0.10	3.1	0.13	4.0	0.17	0.41	0.18	< 0.10	0.55	0.47
Acenaphthene	M	2800	mg/kg	0.10	7.5	0.54	3.5	0.64	0.98	0.59	< 0.10	1.0	1.0
Fluorene	M	2800	mg/kg	0.10	8.1	0.41	5.6	0.60	1.2	0.44	< 0.10	1.0	1.0
Phenanthrene	M	2800	mg/kg	0.10	68	5.2	54	5.8	8.8	6.3	1.7	9.4	9.7
Anthracene	M	2800	mg/kg	0.10	15	1.1	13	1.6	1.9	1.4	0.43	2.6	2.0
Fluoranthene	M	2800	mg/kg	0.10	69	8.8	60	8.6	9.0	9.9	2.6	14	14
Pyrene	M	2800	mg/kg	0.10	68	8.0	49	7.2	9.3	9.1	2.6	16	13
Benzo[a]anthracene	M	2800	mg/kg	0.10	39	4.4	28	4.3	4.8	4.4	1.6	14	6.9
Chrysene	M	2800	mg/kg	0.10	34	3.8	22	3.5	4.4	4.1	1.2	12	5.9
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	42	5.2	29	4.6	5.6	5.1	1.8	21	7.9
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	16	1.7	11	1.4	1.9	1.6	0.52	7.8	2.6
Benzo[a]pyrene	M	2800	mg/kg	0.10	43	4.6	29	4.3	5.2	5.1	1.7	25	7.6
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	29	3.3	20	2.8	3.2	3.5	1.2	18	5.8
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	6.1	0.73	3.3	0.53	0.66	0.60	0.27	3.9	0.73
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	23	2.7	14	1.9	2.6	2.3	1.0	16	4.2
Total Of 16 PAH's	N	2800	mg/kg	2.0	490	51	350	49	63	55	17	160	83
Total Phenols	M	2920	mg/kg	0.30	< 0.30						< 0.30		

TPH Chromatogram on Soil Sample: 1032741

<Sample Information>

Sample Name : 1032741 20-18300
Data Filename : 23 July 2020_23072020_1032741 20-18300_044.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 97
Date Acquired : 23/07/2020 19:13:59
Date Processed : 23/07/2020

<Chromatogram>

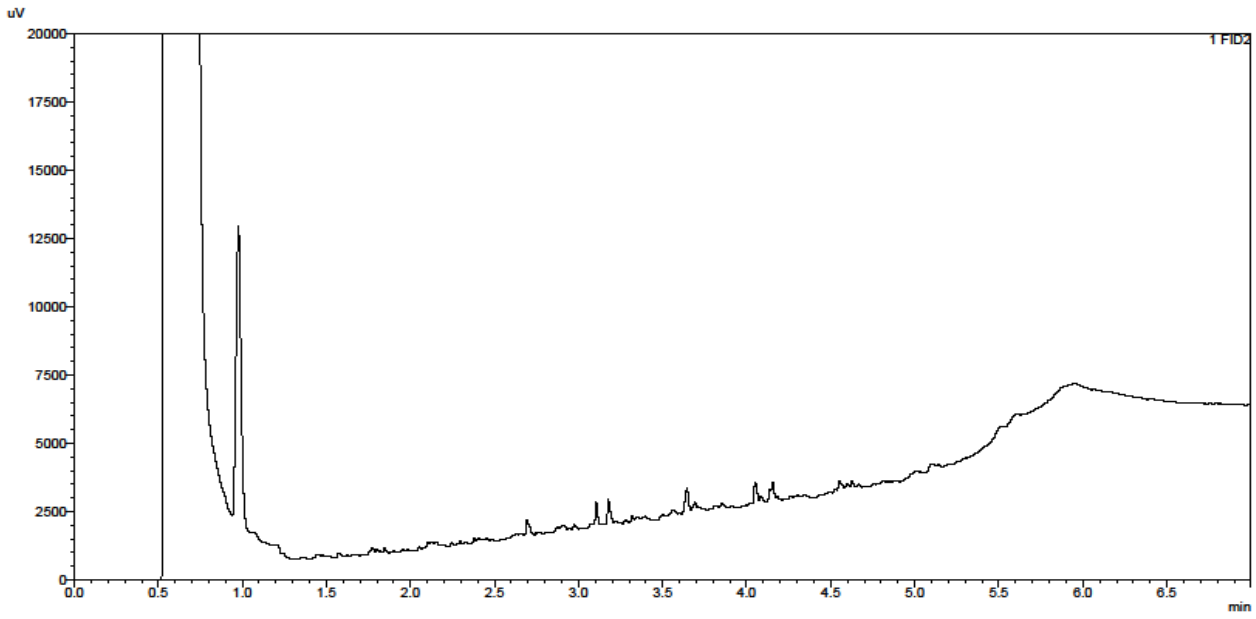


TPH Chromatogram on Soil Sample: 1032760

<Sample Information>

Sample Name : 1032760 20-18300
Data Filename : 23 July 2020_23072020_1032760 20-18300_046.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 98
Date Acquired : 23/07/2020 19:27:09
Date Processed : 23/07/2020

<Chromatogram>



TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
20-18300	1032741	2	TP117/D2			0.20	No	N/A
20-18300	1032741	S	TP117/D2			0.20	No	PAH
20-18300	1032760	S	TP121/D1			0.20		PAH

Test Methods

SOP	Title	Parameters included	Method summary
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by ‘Aquakem 600’ Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18317-1
Initial Date of Issue:	28-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Contaminated Land Paul Quimby
Project	LKC 20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	16-Jul-2020
Order No.:	737856	**Date Instructed:**	22-Jul-2020
No. of Samples:	8		
Turnaround (Wkdays):	5	**Results Due:**	28-Jul-2020
Date Approved:	28-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18317	20-18317	20-18317	20-18317	20-18317	20-18317	20-18317	20-18317
Quotation No.:				**Chemtest Sample ID.:**	1032884	1032885	1032886	1032889	1032891	1032893	1032894	1032896
				Sample Location:	WS9/D1	WS9/D2	WS11D/D1	WS12/D2	WS6/D1	WS6/D3	WS7C/D1	WS8/D2
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.00	1.50	0.00	0.30	0.00	0.80	0.00	0.80
				Bottom Depth (m):	0.60	1.80	0.40	1.00	0.30	1.00	0.60	1.50
				Date Sampled:	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
				Asbestos Lab:	DURHAM		DURHAM	DURHAM	DURHAM		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-		-	-	-		-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-		-	-	-		-	-
Moisture	N	2030	%	0.020	18	12	11	12	10	15	10	13
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A				See Attached				See Attached
pH	M	2010		4.0	8.2	8.2	8.2	8.6	8.7	8.5	8.5	8.5
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40				< 0.40				0.43
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010				< 0.010		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.027	< 0.010	< 0.010	< 0.010	< 0.010	0.010	< 0.010	< 0.010
Chloride (Water Soluble)	M	2220	g/l	0.010		< 0.010				0.014		
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010				< 0.010		
Cyanide (Free)	M	2300	mg/kg	0.50				< 0.50				< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50				< 0.50				< 0.50
Arsenic	M	2450	mg/kg	1.0	99		22	14	29		29	20
Cadmium	M	2450	mg/kg	0.10	0.25		11	0.89	0.72		1.7	0.39
Chromium	M	2450	mg/kg	1.0	30		56	14	21		30	21
Copper	M	2450	mg/kg	0.50	230		150	35	77		120	51
Mercury	M	2450	mg/kg	0.10	3.0		5.1	0.46	0.47		0.65	0.20
Nickel	M	2450	mg/kg	0.50	86		37	15	29		38	35
Lead	M	2450	mg/kg	0.50	710		270	56	200		350	110
Selenium	M	2450	mg/kg	0.20	1.1		0.36	< 0.20	< 0.20		< 0.20	0.21
Vanadium	U	2450	mg/kg	5.0	71		35	17	30		31	26
Zinc	M	2450	mg/kg	0.50	190		190	44	130		270	88
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	< 0.50		< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	26		5.7	1.5	7.6		6.7	5.0
Fuel Type	N	2670		N/A				PAH				PAH
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

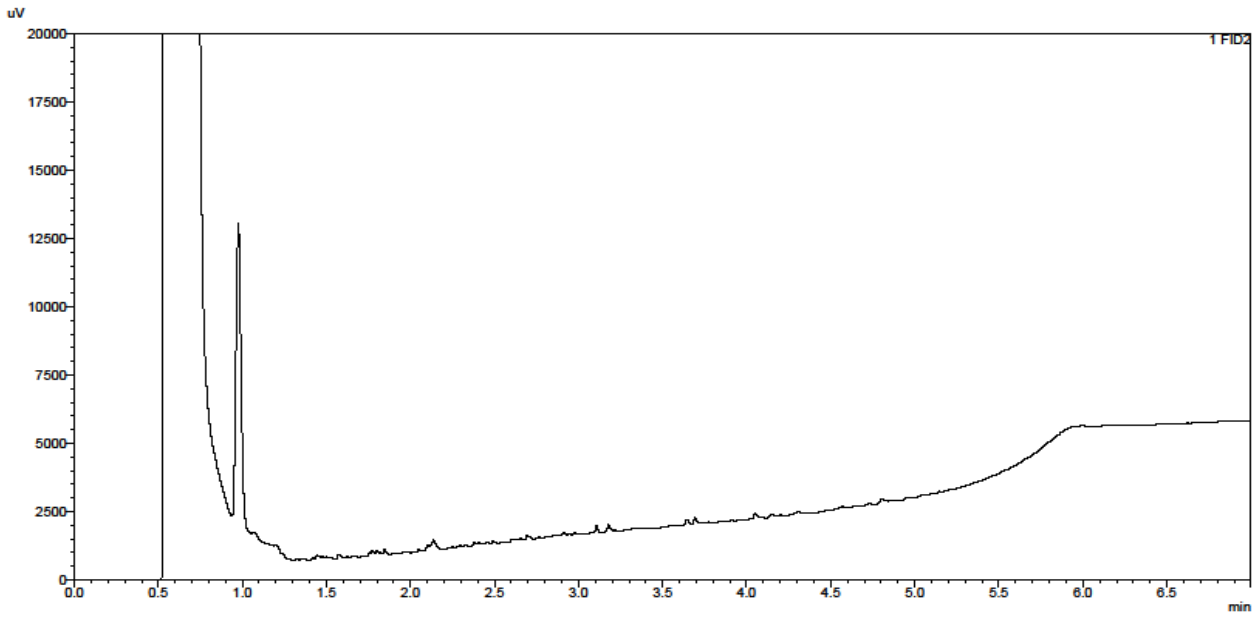
Client: LK Consult			**Chemtest Job No.:**		20-18317	20-18317	20-18317	20-18317	20-18317	20-18317	20-18317	20-18317
Quotation No.:			**Chemtest Sample ID.:**		1032884	1032885	1032886	1032889	1032891	1032893	1032894	1032896
			Sample Location:		WS9/D1	WS9/D2	WS11D/D1	WS12/D2	WS6/D1	WS6/D3	WS7C/D1	WS8/D2
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.50	0.00	0.30	0.00	0.80	0.00	0.80
			Bottom Depth (m):		0.60	1.80	0.40	1.00	0.30	1.00	0.60	1.50
			Date Sampled:		14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020	14-Jul-2020
			Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM		DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0				< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0				< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				9.3				9.9
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				54
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				9.3				64
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10				64
Benzene	M	2760	µg/kg	1.0				< 1.0				< 1.0
Toluene	M	2760	µg/kg	1.0				< 1.0				< 1.0
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0				< 1.0
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0
o-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0				< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10		0.37	< 0.10	0.55		< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10		0.13	< 0.10	0.22		< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10		0.27	< 0.10	0.81		< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10		0.24	< 0.10	0.94		< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.93		2.6	0.46	12		3.8	2.4
Anthracene	M	2800	mg/kg	0.10	0.23		0.64	0.12	2.9		0.96	0.68
Fluoranthene	M	2800	mg/kg	0.10	1.4		4.3	0.60	21		6.1	4.7
Pyrene	M	2800	mg/kg	0.10	1.3		4.0	0.53	18		5.4	4.3
Benzo[a]anthracene	M	2800	mg/kg	0.10	1.0		2.2	0.28	10		3.1	2.5
Chrysene	M	2800	mg/kg	0.10	0.89		2.0	0.25	8.4		2.7	2.1
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.3		3.0	0.40	13		4.1	3.4
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.45		0.98	0.11	4.6		1.4	1.0
Benzo[a]pyrene	M	2800	mg/kg	0.10	1.2		2.7	0.33	11		3.7	3.1
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.1		1.8	< 0.10	8.3		2.6	2.4
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10		0.39	< 0.10	1.3		0.42	0.42
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.89		1.5	< 0.10	6.3		1.9	2.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	11		27	3.1	120		36	29
Total Phenols	M	2920	mg/kg	0.30				< 0.30				< 0.30

TPH Chromatogram on Soil Sample: 1032889

<Sample Information>

Sample Name : 1032889 20-18317
Data Filename : 23 July 2020_23072020_1032889 20-18317_040.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 95
Date Acquired : 23/07/2020 18:47:42
Date Processed : 23/07/2020

<Chromatogram>



TPH Chromatogram on Soil Sample: 1032896

<Sample Information>

Sample Name : 1032896 20-18317
Data Filename : 23 July 2020_23072020_1032896 20-18317_042.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 96
Date Acquired : 23/07/2020 19:00:48
Date Processed : 23/07/2020

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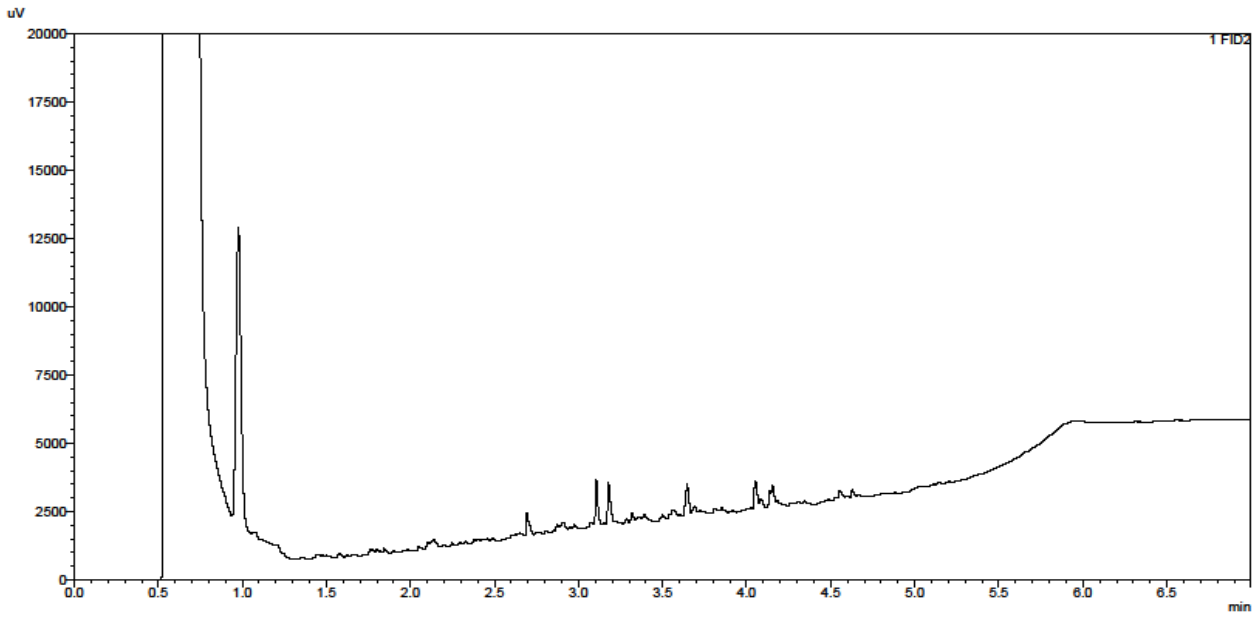


Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	20-18506-2		
Initial Date of Issue:	28-Jul-2020	**Date of Re-Issue:**	04-Aug-2020
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Contaminated Land Paul Quimby Chris Hughes		
Project	LKC 20 1120 Rochdale Road, Collyhurst		
Quotation No.:		**Date Received:**	17-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	18		
Turnaround (Wkdays):	10	**Results Due:**	04-Aug-2020
Date Approved:	04-Aug-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Bulk Identification Certificate

Client: LK Consult

Site Address:

Date Sampled: 15-Jul-2020

Date Received: 17-Jul-2020

Your Ref.:

Project: LKC 20 1120 Rochdale Road, Collyhurst

Job Number: 20-18506

No Samples:

Date Reported: 28-Jul-2020

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1033758	TP108/ACM			0.80		2185	U	DURHAM	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).
The results relate only to items tested as supplied by the client.
Comments and interpretations are beyond the scope of UKAS accreditation.
Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult		**Chemtest Job No.:**			20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:		**Chemtest Sample ID.:**			1033720	1033721	1033722	1033725	1033728	1033731	1033734	1033735	1033737
		Client Sample ID.:			WS4/D1	WS4/D2	WS1/D1	WS2/D2	WS5/D1	WS3B/D1	WS13/D1	WS13/D2	WS3/D1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	1.20	0.10	0.70	0.0	0.00	0.00	0.80	0.10
		Bottom Depth (m):			0.80	1.50	0.50	1.00	0..30	0.50	0.50	1.70	0.40
		Date Sampled:			15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
		Asbestos Lab:			COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-	-	-	-	-	-	Fibres/Clumps
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile
ACM Detection Stage	U	2192		N/A	-		-	-	-	-	-	-	Stereo Microscopy
Asbestos by Gravimetry	U	2192	%	0.001									<0.001
Total Asbestos	N	2192	%	0.001									<0.001
Moisture	N	2030	%	0.020	11	11	14	19	6.7	13	12	13	9.7
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Clay	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A				See Attached				See Attached	
pH	M	2010		4.0	9.6	8.8	8.7	8.1	11.5	7.8	8.6	7.6	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40				1.3				0.70	
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010							
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.28	0.013	0.088	0.11	0.75	0.039	0.017	0.027	< 0.010
Chloride (Water Soluble)	M	2220	g/l	0.010		< 0.010							
Nitrate (Water Soluble)	N	2220	g/l	0.010		0.011							
Cyanide (Free)	M	2300	mg/kg	0.50				< 0.50				< 0.50	
Cyanide (Total)	M	2300	mg/kg	0.50				< 0.50				< 0.50	
Arsenic	M	2450	mg/kg	1.0	14		16	16	14	15	29	14	33
Cadmium	M	2450	mg/kg	0.10	0.35		0.36	0.17	2.3	1.1	< 0.10	0.18	< 0.10
Chromium	M	2450	mg/kg	1.0	24		24	23	24	18	24	29	24
Copper	M	2450	mg/kg	0.50	290		72	130	22	45	78	38	84
Mercury	M	2450	mg/kg	0.10	0.33		0.37	0.44	0.19	0.32	0.95	0.32	0.48
Nickel	M	2450	mg/kg	0.50	32		32	33	18	23	32	42	29
Lead	M	2450	mg/kg	0.50	88		120	1000	58	160	1400	80	520
Selenium	M	2450	mg/kg	0.20	< 0.20		0.26	0.46	< 0.20	0.43	0.45	0.51	0.34
Vanadium	U	2450	mg/kg	5.0	18		23	30	12	23	26	31	27
Zinc	M	2450	mg/kg	0.50	98		84	91	47	98	320	73	120
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	0.69	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	3.5		5.5	12	3.6	6.2	7.9	3.8	4.7
Fuel Type	N	2670		N/A				N/A				PAH	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult			**Chemtest Job No.:**		20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:			**Chemtest Sample ID.:**		1033720	1033721	1033722	1033725	1033728	1033731	1033734	1033735	1033737
			Client Sample ID.:		WS4/D1	WS4/D2	WS1/D1	WS2/D2	WS5/D1	WS3B/D1	WS13/D1	WS13/D2	WS3/D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	1.20	0.10	0.70	0.0	0.00	0.00	0.80	0.10
			Bottom Depth (m):		0.80	1.50	0.50	1.00	0..30	0.50	0.50	1.70	0.40
			Date Sampled:		15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
			Asbestos Lab:		COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				88	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0				88	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				40	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0				40	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10				130	
Benzene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Toluene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
o-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Naphthalene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.59	2.7	< 0.10	< 0.10	< 0.10	0.46
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.47	0.11	< 0.10	< 0.10	< 0.10	0.24
Acenaphthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.65	4.7	< 0.10	< 0.10	< 0.10	2.5
Fluorene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.73	3.2	< 0.10	< 0.10	< 0.10	1.4
Phenanthrene	M	2800	mg/kg	0.10	3.4		2.1	5.1	18	2.1	2.8	1.2	13
Anthracene	M	2800	mg/kg	0.10	1.0		0.50	1.2	4.5	0.51	0.50	0.29	3.1
Fluoranthene	M	2800	mg/kg	0.10	4.9		3.4	8.3	19	3.1	4.7	1.7	20
Pyrene	M	2800	mg/kg	0.10	4.1		2.9	8.5	16	2.5	4.1	2.4	18
Benzo[a]anthracene	M	2800	mg/kg	0.10	2.1		1.6	3.9	6.2	1.4	1.9	1.7	8.3
Chrysene	M	2800	mg/kg	0.10	1.9		1.3	4.1	7.4	1.4	2.3	1.6	8.6
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	2.7		1.8	6.2	8.2	1.9	2.9	2.9	10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.77		0.71	2.1	2.6	0.69	1.1	1.2	4.1
Benzo[a]pyrene	M	2800	mg/kg	0.10	2.0		1.8	4.8	6.5	1.5	2.2	3.3	9.0
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.2		0.95	3.0	4.0	0.95	1.4	2.0	5.1
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.54	0.72	< 0.10	< 0.10	< 0.10	1.2
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	1.1		1.4	3.1	3.8	1.1	1.7	2.3	5.0
Total Of 16 PAH's	N	2800	mg/kg	2.0	25		18	53	110	17	26	21	110
Total Phenols	M	2920	mg/kg	0.30				< 0.30				< 0.30	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:				**Chemtest Sample ID.:**	1033738	1033739	1033742	1033745	1033747	1033751	1033755	1033759
				Client Sample ID.:	WS3/D2	TP118/D1	TP119/D2	TP111/D1	TP113/D1	TP112/D2	TP108/D1	TP101/D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.8	0.20	0.40	0.10	0.00	0.30	0.00	0.00
				Bottom Depth (m):	1.2	1.00	0.80	1.10	0.30	1.00	0.30	1.00
				Date Sampled:	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
				Asbestos Lab:	DURHAM	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos by Gravimetry	U	2192	%	0.001								
Total Asbestos	N	2192	%	0.001								
Moisture	N	2030	%	0.020	16	11	11	13	12	9.0	15	10
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	None	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A			See Attached			See Attached		See Attached
pH	M	2010		4.0	8.0	8.5	8.0	8.2	8.2	10.9	8.4	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40			0.61			0.72		0.76
Magnesium (Water Soluble)	N	2120	g/l	0.010								
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.071	< 0.010	0.031	0.011	< 0.010	0.65	< 0.010	0.058
Chloride (Water Soluble)	M	2220	g/l	0.010								
Nitrate (Water Soluble)	N	2220	g/l	0.010								
Cyanide (Free)	M	2300	mg/kg	0.50			< 0.50			< 0.50		< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50			7.8			< 0.50		1.1
Arsenic	M	2450	mg/kg	1.0	12	23	31	37	20	11	16	62
Cadmium	M	2450	mg/kg	0.10	3.8	2.3	1.7	0.33	0.56	0.19	0.56	0.98
Chromium	M	2450	mg/kg	1.0	53	27	20	23	26	12	22	38
Copper	M	2450	mg/kg	0.50	130	210	480	76	63	22	58	260
Mercury	M	2450	mg/kg	0.10	1.3	0.83	0.72	0.27	1.0	< 0.10	0.51	2.1
Nickel	M	2450	mg/kg	0.50	28	31	47	52	26	13	22	51
Lead	M	2450	mg/kg	0.50	210	480	360	300	240	42	170	490
Selenium	M	2450	mg/kg	0.20	0.58	0.25	1.2	0.65	< 0.20	< 0.20	0.30	0.87
Vanadium	U	2450	mg/kg	5.0	20	29	24	32	24	13	19	86
Zinc	M	2450	mg/kg	0.50	350	160	120	75	130	41	110	190
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	8.6	5.9	48	8.3	4.8	1.5	4.7	14
Fuel Type	N	2670		N/A			PAH			N/A		PAH
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

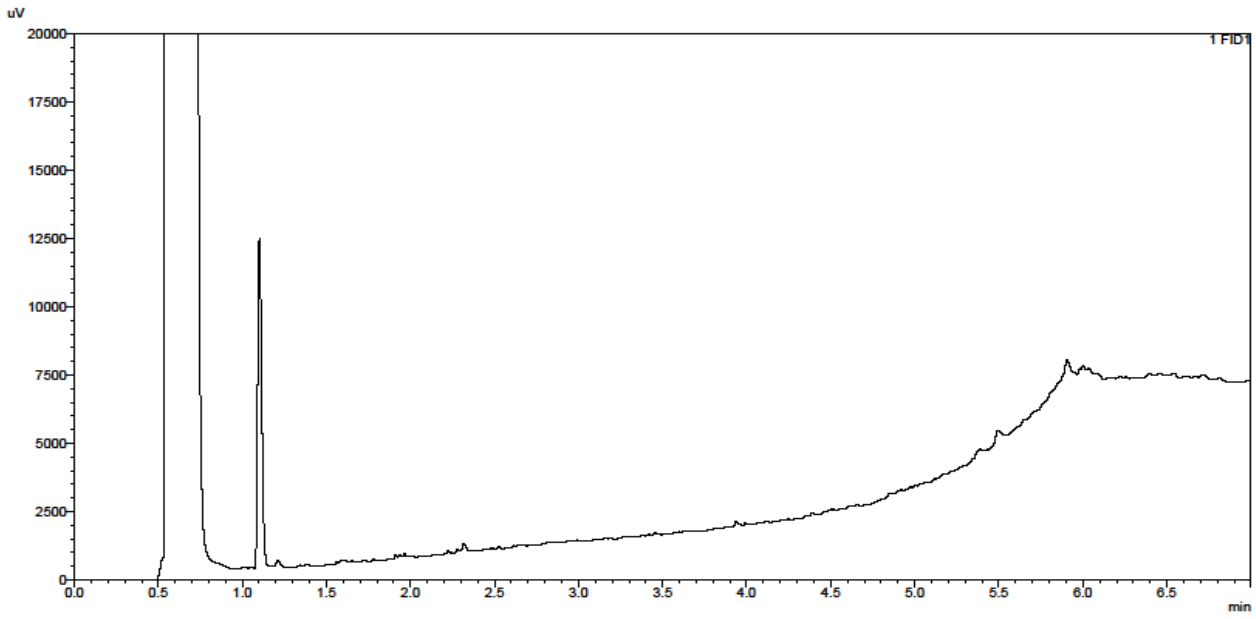
Client: LK Consult		**Chemtest Job No.:**			20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:		**Chemtest Sample ID.:**			1033738	1033739	1033742	1033745	1033747	1033751	1033755	1033759
		Client Sample ID.:			WS3/D2	TP118/D1	TP119/D2	TP111/D1	TP113/D1	TP112/D2	TP108/D1	TP101/D1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.8	0.20	0.40	0.10	0.00	0.30	0.00	0.00
		Bottom Depth (m):			1.2	1.00	0.80	1.10	0.30	1.00	0.30	1.00
		Date Sampled:			15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
		Asbestos Lab:			DURHAM	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0			54			37		57
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0			130			< 1.0		< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			180			37		57
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0			14			< 1.0		< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0			210			< 1.0		6.5
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0			2000			180		45
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0			61			< 1.0		< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0			2300			180		52
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0			2500			220		110
Benzene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Toluene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Ethylbenzene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
m & p-Xylene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
o-Xylene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Naphthalene	M	2800	mg/kg	0.10	0.40	< 0.10	15	22	1.2	< 0.10	0.75	0.56
Acenaphthylene	N	2800	mg/kg	0.10	0.11	< 0.10	6.8	0.49	0.19	< 0.10	0.21	0.18
Acenaphthene	M	2800	mg/kg	0.10	1.6	< 0.10	33	18	1.1	< 0.10	2.5	0.72
Fluorene	M	2800	mg/kg	0.10	1.2	< 0.10	27	13	0.76	< 0.10	1.7	0.55
Phenanthrene	M	2800	mg/kg	0.10	8.4	0.88	210	78	6.6	2.0	13	5.7
Anthracene	M	2800	mg/kg	0.10	1.9	0.28	60	17	2.2	0.65	3.1	1.2
Fluoranthene	M	2800	mg/kg	0.10	16	1.1	250	54	13	2.8	19	5.8
Pyrene	M	2800	mg/kg	0.10	15	1.2	250	56	12	2.6	17	6.4
Benzo[a]anthracene	M	2800	mg/kg	0.10	8.4	< 0.10	160	24	5.7	1.2	8.0	3.1
Chrysene	M	2800	mg/kg	0.10	7.8	< 0.10	170	25	5.2	1.2	8.4	3.6
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	11	< 0.10	270	27	7.3	1.9	11	5.1
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	4.4	< 0.10	120	8.6	2.3	0.97	4.1	1.6
Benzo[a]pyrene	M	2800	mg/kg	0.10	10	< 0.10	370	23	6.4	1.8	9.0	5.4
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	6.5	< 0.10	270	11	3.5	1.1	5.1	4.1
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	1.4	< 0.10	56	2.9	0.78	< 0.10	0.93	0.73
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	6.1	< 0.10	310	11	3.6	1.3	5.6	4.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	100	3.4	2600	390	72	18	110	49
Total Phenols	M	2920	mg/kg	0.30			< 0.30			< 0.30		< 0.30

TPH Chromatogram on Soil Sample: 1033725

<Sample Information>

Sample Name : 1033725 20-18506
Data Filename : 23 July 2020_23072020_1033725 20-18506_073.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 37
Date Acquired : 23/07/2020 23:27:00
Date Processed : 23/07/2020

<Chromatogram>

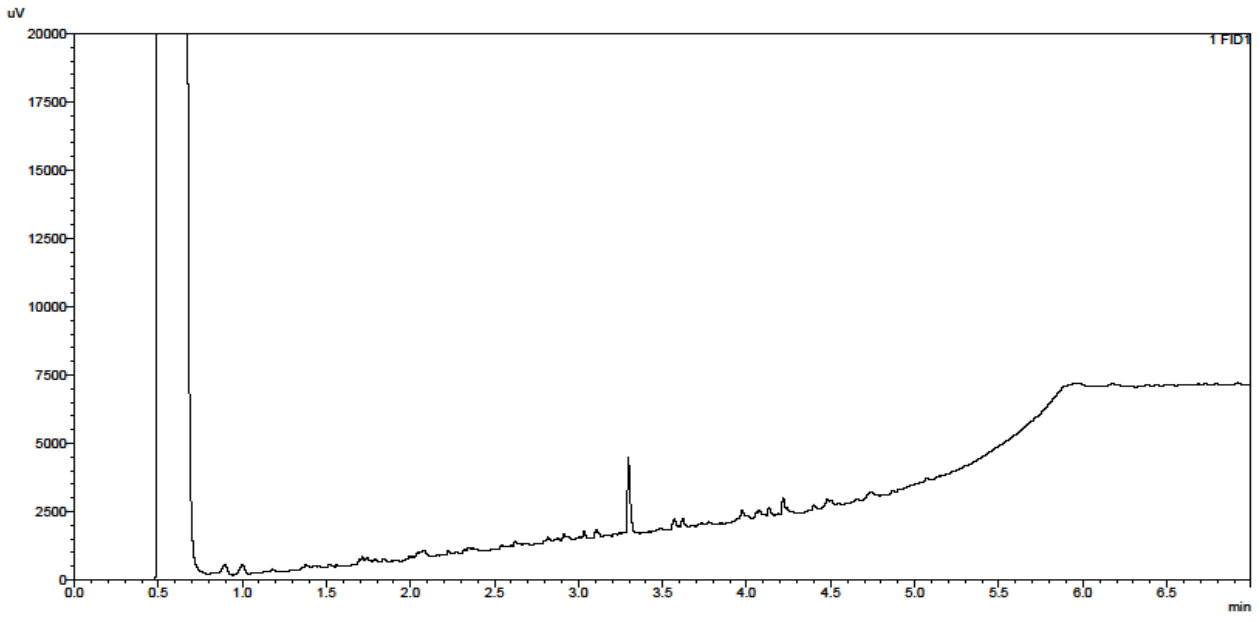


TPH Chromatogram on Soil Sample: 1033735

<Sample Information>

Sample Name : 1033735 20-18506
Data Filename : 30 July 2020_30072020_1033735 20-18506_022.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 22
Date Acquired : 30/07/2020 20:39:41
Date Processed : 30/07/2020

<Chromatogram>

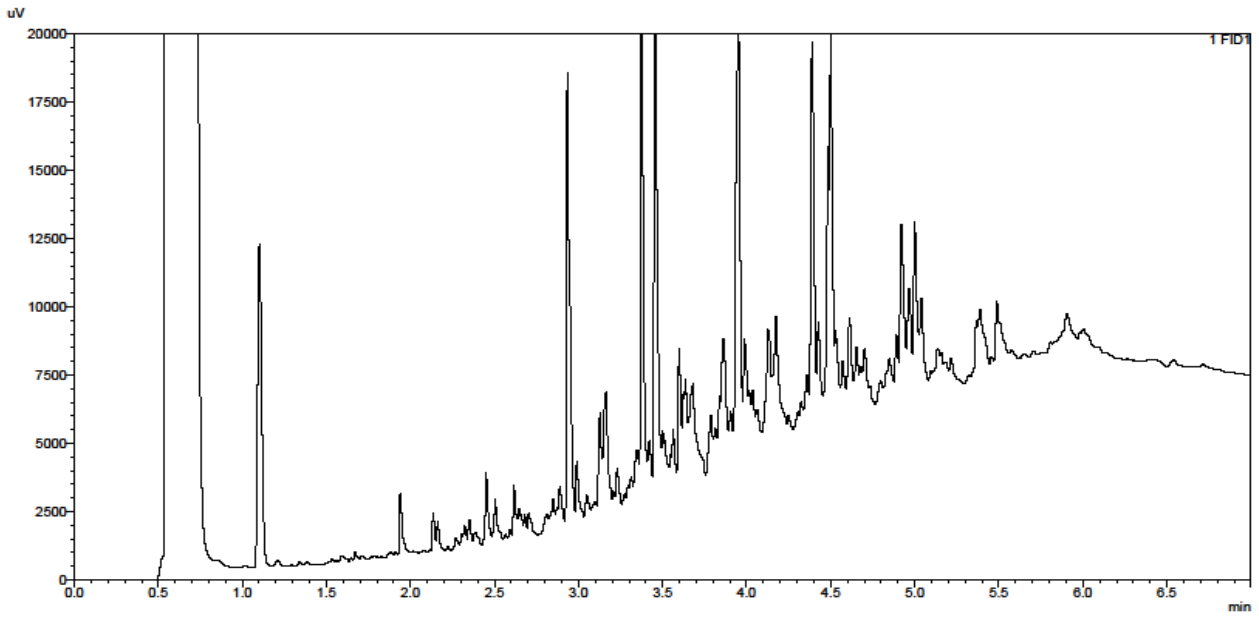


TPH Chromatogram on Soil Sample: 1033742

<Sample Information>

Sample Name : 1033742 20-18506
Data Filename : 23 July 2020_23072020_1033742 20-18506_075.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 38
Date Acquired : 23/07/2020 23:39:26
Date Processed : 23/07/2020

<Chromatogram>

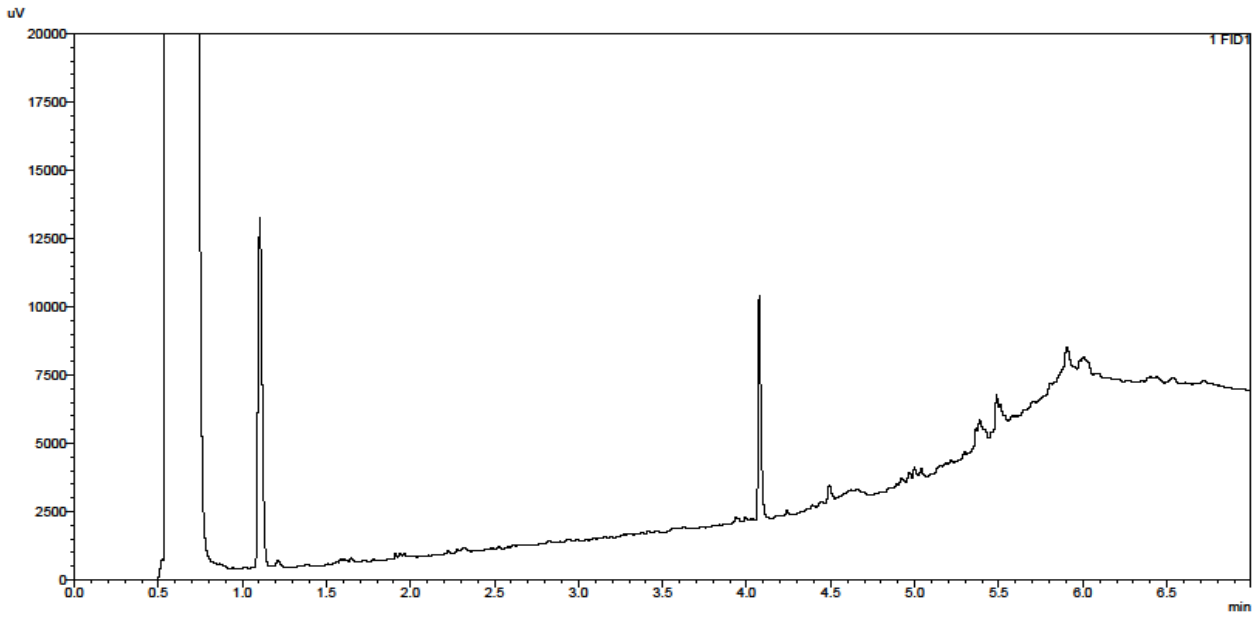


TPH Chromatogram on Soil Sample: 1033751

<Sample Information>

Sample Name : 1033751 20-18506
Data Filename : 23 July 2020_23072020_1033751 20-18506_077.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 39
Date Acquired : 23/07/2020 23:51:55
Date Processed : 23/07/2020

<Chromatogram>

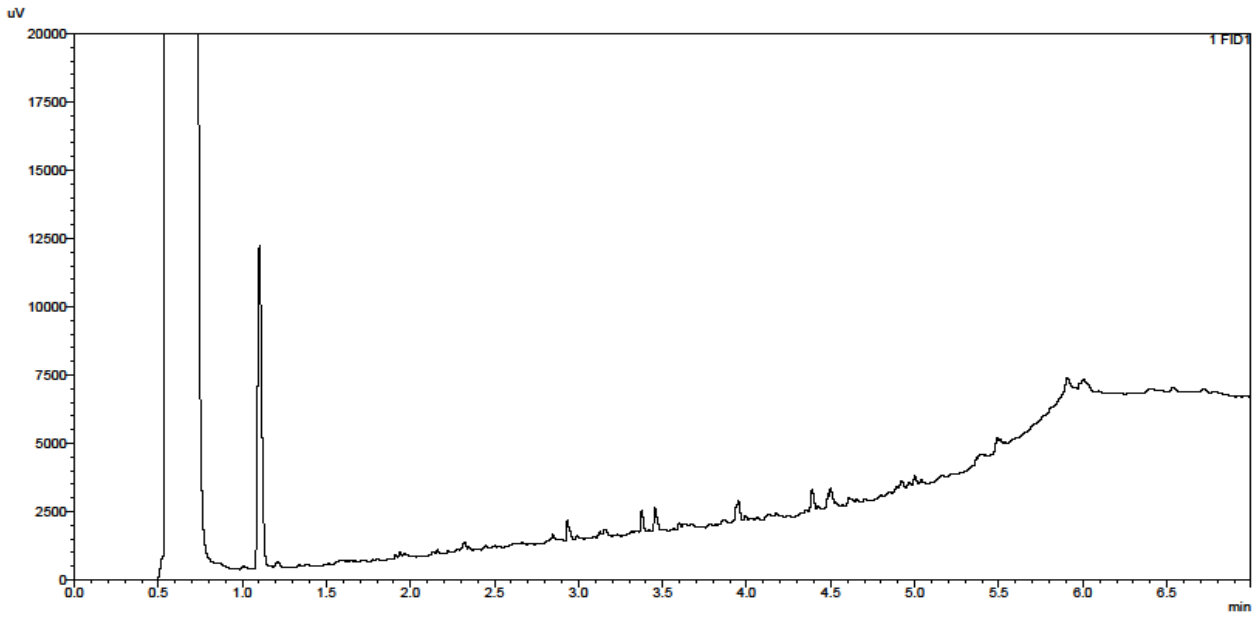


TPH Chromatogram on Soil Sample: 1033759

<Sample Information>

Sample Name : 1033759 20-18506
Data Filename : 23 July 2020_23072020_1033759 20-18506_079.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 40
Date Acquired : 24/07/2020 00:04:20
Date Processed : 24/07/2020

<Chromatogram>



Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	20-18506-3		
Initial Date of Issue:	28-Jul-2020	**Date of Re-Issue:**	03-Sep-2020
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Contaminated Land Paul Quimby Chris Hughes		
Project	LKC 20 1120 Rochdale Road, Collyhurst		
Quotation No.:		**Date Received:**	17-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	18		
Turnaround (Wkdays):	31	**Results Due:**	03-Sep-2020
Date Approved:	03-Sep-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Bulk Identification Certificate

Client: LK Consult

Site Address:

Date Sampled: 15-Jul-2020

Date Received: 17-Jul-2020

Your Ref.:

Project: LKC 20 1120 Rochdale Road, Collyhurst

Job Number: 20-18506

No Samples:

Date Reported: 28-Jul-2020

Sample No.	Sample ID	Sample Ref.	Description	Top (m)	Bottom (m)	SOP	Accred.	Laboratory	Material	Result
1033758	TP108/ACM			0.80		2185	U	DURHAM	Cement	Chrysotile

The in-house procedure SOP2185 is in accordance with the requirements of Appendix 2 of the Analyst Guide (HSG 248).
The results relate only to items tested as supplied by the client.
Comments and interpretations are beyond the scope of UKAS accreditation.
Samples associated with asbestos in building surveys are retained for six months (HSG 264 refers)

Results - Leachate

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**		20-18506
Quotation No.:				**Chemtest Sample ID.:**		1033742
				Client Sample ID.:		TP119/D2
				Sample Type:		SOIL
				Top Depth (m):		0.40
				Bottom Depth (m):		0.80
				Date Sampled:		15-Jul-2020
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
C2 Aliphatic TPH >C5-C6	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C6-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	2:1	µg/l	5.0	< 5.0
C2 Aromatic TPH >C5-C7	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C7-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	< 0.10
C2 Total Aromatic Hydrocarbons	N	1675	2:1	µg/l	5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	2:1	µg/l	10	< 10
Total Organic Carbon	U	1610	2:1	mg/l	2.0	6.3
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	2:1	µg/l	1.0	< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:				**Chemtest Sample ID.:**	1033720	1033721	1033722	1033725	1033728	1033731	1033734	1033735	1033737
				Client Sample ID.:	WS4/D1	WS4/D2	WS1/D1	WS2/D2	WS5/D1	WS3B/D1	WS13/D1	WS13/D2	WS3/D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.10	1.20	0.10	0.70	0.0	0.00	0.00	0.80	0.10
				Bottom Depth (m):	0.80	1.50	0.50	1.00	0..30	0.50	0.50	1.70	0.40
				Date Sampled:	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
				Asbestos Lab:	COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-	-	-	-	-	-	Fibres/Clumps
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile
ACM Detection Stage	U	2192		N/A	-		-	-	-	-	-	-	Stereo Microscopy
Asbestos by Gravimetry	U	2192	%	0.001									<0.001
Total Asbestos	U	2192	%	0.001									<0.001
Moisture	N	2030	%	0.020	11	11	14	19	6.7	13	12	13	9.7
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Clay	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A				See Attached				See Attached	
pH	M	2010		4.0	9.6	8.8	8.7	8.1	11.5	7.8	8.6	7.6	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40				1.3				0.70	
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010							
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.28	0.013	0.088	0.11	0.75	0.039	0.017	0.027	< 0.010
Chloride (Water Soluble)	M	2220	g/l	0.010		< 0.010							
Nitrate (Water Soluble)	N	2220	g/l	0.010		0.011							
Cyanide (Free)	M	2300	mg/kg	0.50				< 0.50				< 0.50	
Cyanide (Total)	M	2300	mg/kg	0.50				< 0.50				< 0.50	
Arsenic	M	2450	mg/kg	1.0	14		16	16	14	15	29	14	33
Cadmium	M	2450	mg/kg	0.10	0.35		0.36	0.17	2.3	1.1	< 0.10	0.18	< 0.10
Chromium	M	2450	mg/kg	1.0	24		24	23	24	18	24	29	24
Copper	M	2450	mg/kg	0.50	290		72	130	22	45	78	38	84
Mercury	M	2450	mg/kg	0.10	0.33		0.37	0.44	0.19	0.32	0.95	0.32	0.48
Nickel	M	2450	mg/kg	0.50	32		32	33	18	23	32	42	29
Lead	M	2450	mg/kg	0.50	88		120	1000	58	160	1400	80	520
Selenium	M	2450	mg/kg	0.20	< 0.20		0.26	0.46	< 0.20	0.43	0.45	0.51	0.34
Vanadium	U	2450	mg/kg	5.0	18		23	30	12	23	26	31	27
Zinc	M	2450	mg/kg	0.50	98		84	91	47	98	320	73	120
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	0.69	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	3.5		5.5	12	3.6	6.2	7.9	3.8	4.7
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0				< 1.0				< 1.0	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult			**Chemtest Job No.:**		20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:			**Chemtest Sample ID.:**		1033720	1033721	1033722	1033725	1033728	1033731	1033734	1033735	1033737
			Client Sample ID.:		WS4/D1	WS4/D2	WS1/D1	WS2/D2	WS5/D1	WS3B/D1	WS13/D1	WS13/D2	WS3/D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	1.20	0.10	0.70	0.0	0.00	0.00	0.80	0.10
			Bottom Depth (m):		0.80	1.50	0.50	1.00	0..30	0.50	0.50	1.70	0.40
			Date Sampled:		15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
			Asbestos Lab:		COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				88	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0				88	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				< 1.0				< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0				40	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0				< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0				40	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10				130	
Benzene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Toluene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
o-Xylene	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0				< 1.0	
Naphthalene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.59	2.7	< 0.10	< 0.10	< 0.10	0.46
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.47	0.11	< 0.10	< 0.10	< 0.10	0.24
Acenaphthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.65	4.7	< 0.10	< 0.10	< 0.10	2.5
Fluorene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.73	3.2	< 0.10	< 0.10	< 0.10	1.4
Phenanthrene	M	2800	mg/kg	0.10	3.4		2.1	5.1	18	2.1	2.8	1.2	13
Anthracene	M	2800	mg/kg	0.10	1.0		0.50	1.2	4.5	0.51	0.50	0.29	3.1
Fluoranthene	M	2800	mg/kg	0.10	4.9		3.4	8.3	19	3.1	4.7	1.7	20
Pyrene	M	2800	mg/kg	0.10	4.1		2.9	8.5	16	2.5	4.1	2.4	18
Benzo[a]anthracene	M	2800	mg/kg	0.10	2.1		1.6	3.9	6.2	1.4	1.9	1.7	8.3
Chrysene	M	2800	mg/kg	0.10	1.9		1.3	4.1	7.4	1.4	2.3	1.6	8.6
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	2.7		1.8	6.2	8.2	1.9	2.9	2.9	10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.77		0.71	2.1	2.6	0.69	1.1	1.2	4.1
Benzo[a]pyrene	M	2800	mg/kg	0.10	2.0		1.8	4.8	6.5	1.5	2.2	3.3	9.0
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.2		0.95	3.0	4.0	0.95	1.4	2.0	5.1
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.54	0.72	< 0.10	< 0.10	< 0.10	1.2
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	1.1		1.4	3.1	3.8	1.1	1.7	2.3	5.0
Total Of 16 PAH's	N	2800	mg/kg	2.0	25		18	53	110	17	26	21	110
Total Phenols	M	2920	mg/kg	0.30				< 0.30				< 0.30	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:				**Chemtest Sample ID.:**	1033738	1033739	1033742	1033745	1033747	1033751	1033755	1033759
				Client Sample ID.:	WS3/D2	TP118/D1	TP119/D2	TP111/D1	TP113/D1	TP112/D2	TP108/D1	TP101/D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.8	0.20	0.40	0.10	0.00	0.30	0.00	0.00
				Bottom Depth (m):	1.2	1.00	0.80	1.10	0.30	1.00	0.30	1.00
				Date Sampled:	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
				Asbestos Lab:	DURHAM	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos by Gravimetry	U	2192	%	0.001								
Total Asbestos	U	2192	%	0.001								
Moisture	N	2030	%	0.020	16	11	11	13	12	9.0	15	10
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	None	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A			See Attached			See Attached		See Attached
pH	M	2010		4.0	8.0	8.5	8.0	8.2	8.2	10.9	8.4	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40			0.61			0.72		0.76
Magnesium (Water Soluble)	N	2120	g/l	0.010								
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.071	< 0.010	0.031	0.011	< 0.010	0.65	< 0.010	0.058
Chloride (Water Soluble)	M	2220	g/l	0.010								
Nitrate (Water Soluble)	N	2220	g/l	0.010								
Cyanide (Free)	M	2300	mg/kg	0.50			< 0.50			< 0.50		< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50			7.8			< 0.50		1.1
Arsenic	M	2450	mg/kg	1.0	12	23	31	37	20	11	16	62
Cadmium	M	2450	mg/kg	0.10	3.8	2.3	1.7	0.33	0.56	0.19	0.56	0.98
Chromium	M	2450	mg/kg	1.0	53	27	20	23	26	12	22	38
Copper	M	2450	mg/kg	0.50	130	210	480	76	63	22	58	260
Mercury	M	2450	mg/kg	0.10	1.3	0.83	0.72	0.27	1.0	< 0.10	0.51	2.1
Nickel	M	2450	mg/kg	0.50	28	31	47	52	26	13	22	51
Lead	M	2450	mg/kg	0.50	210	480	360	300	240	42	170	490
Selenium	M	2450	mg/kg	0.20	0.58	0.25	1.2	0.65	< 0.20	< 0.20	0.30	0.87
Vanadium	U	2450	mg/kg	5.0	20	29	24	32	24	13	19	86
Zinc	M	2450	mg/kg	0.50	350	160	120	75	130	41	110	190
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	8.6	5.9	48	8.3	4.8	1.5	4.7	14
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

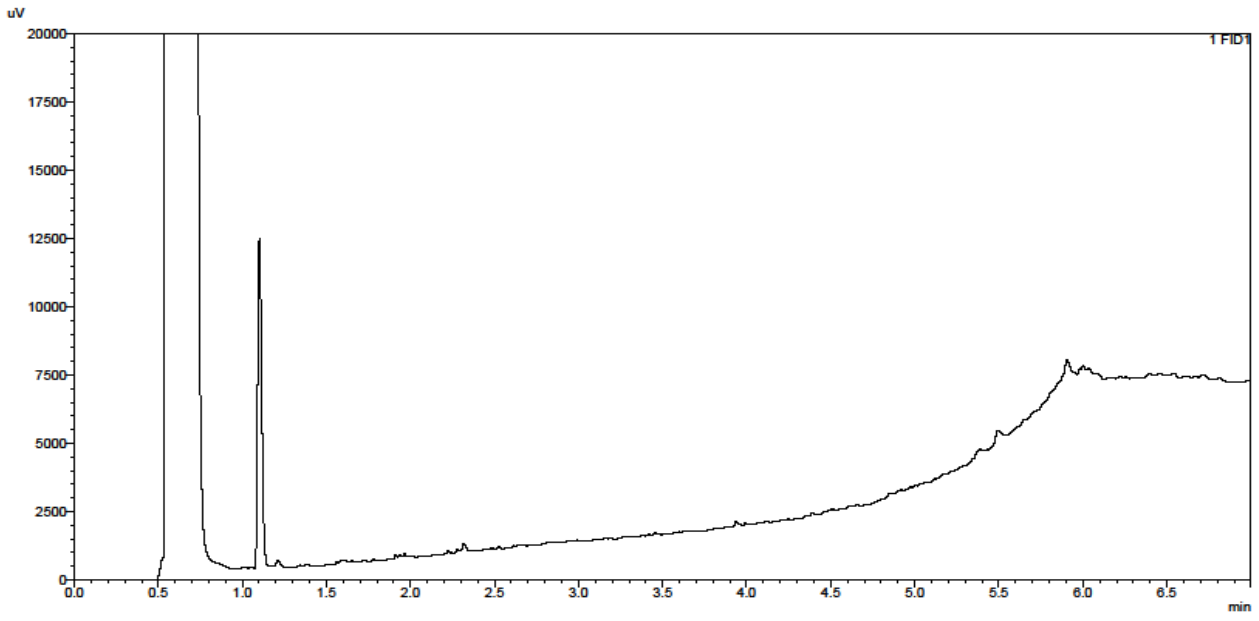
Client: LK Consult		**Chemtest Job No.:**			20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506	20-18506
Quotation No.:		**Chemtest Sample ID.:**			1033738	1033739	1033742	1033745	1033747	1033751	1033755	1033759
		Client Sample ID.:			WS3/D2	TP118/D1	TP119/D2	TP111/D1	TP113/D1	TP112/D2	TP108/D1	TP101/D1
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.8	0.20	0.40	0.10	0.00	0.30	0.00	0.00
		Bottom Depth (m):			1.2	1.00	0.80	1.10	0.30	1.00	0.30	1.00
		Date Sampled:			15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020	15-Jul-2020
		Asbestos Lab:			DURHAM	COVENTRY	COVENTRY	COVENTRY	COVENTRY	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0			54			37		57
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0			130			< 1.0		< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			180			37		57
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0			< 1.0			< 1.0		< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0			14			< 1.0		< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0			210			< 1.0		6.5
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0			2000			180		45
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0			61			< 1.0		< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0			2300			180		52
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0			2500			220		110
Benzene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Toluene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Ethylbenzene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
m & p-Xylene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
o-Xylene	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0			< 1.0			< 1.0		< 1.0
Naphthalene	M	2800	mg/kg	0.10	0.40	< 0.10	15	22	1.2	< 0.10	0.75	0.56
Acenaphthylene	N	2800	mg/kg	0.10	0.11	< 0.10	6.8	0.49	0.19	< 0.10	0.21	0.18
Acenaphthene	M	2800	mg/kg	0.10	1.6	< 0.10	33	18	1.1	< 0.10	2.5	0.72
Fluorene	M	2800	mg/kg	0.10	1.2	< 0.10	27	13	0.76	< 0.10	1.7	0.55
Phenanthrene	M	2800	mg/kg	0.10	8.4	0.88	210	78	6.6	2.0	13	5.7
Anthracene	M	2800	mg/kg	0.10	1.9	0.28	60	17	2.2	0.65	3.1	1.2
Fluoranthene	M	2800	mg/kg	0.10	16	1.1	250	54	13	2.8	19	5.8
Pyrene	M	2800	mg/kg	0.10	15	1.2	250	56	12	2.6	17	6.4
Benzo[a]anthracene	M	2800	mg/kg	0.10	8.4	< 0.10	160	24	5.7	1.2	8.0	3.1
Chrysene	M	2800	mg/kg	0.10	7.8	< 0.10	170	25	5.2	1.2	8.4	3.6
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	11	< 0.10	270	27	7.3	1.9	11	5.1
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	4.4	< 0.10	120	8.6	2.3	0.97	4.1	1.6
Benzo[a]pyrene	M	2800	mg/kg	0.10	10	< 0.10	370	23	6.4	1.8	9.0	5.4
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	6.5	< 0.10	270	11	3.5	1.1	5.1	4.1
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	1.4	< 0.10	56	2.9	0.78	< 0.10	0.93	0.73
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	6.1	< 0.10	310	11	3.6	1.3	5.6	4.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	100	3.4	2600	390	72	18	110	49
Total Phenols	M	2920	mg/kg	0.30			< 0.30			< 0.30		< 0.30

TPH Chromatogram on Soil Sample: 1033725

<Sample Information>

Sample Name : 1033725 20-18506
Data Filename : 23 July 2020_23072020_1033725 20-18506_073.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 37
Date Acquired : 23/07/2020 23:27:00
Date Processed : 23/07/2020

<Chromatogram>

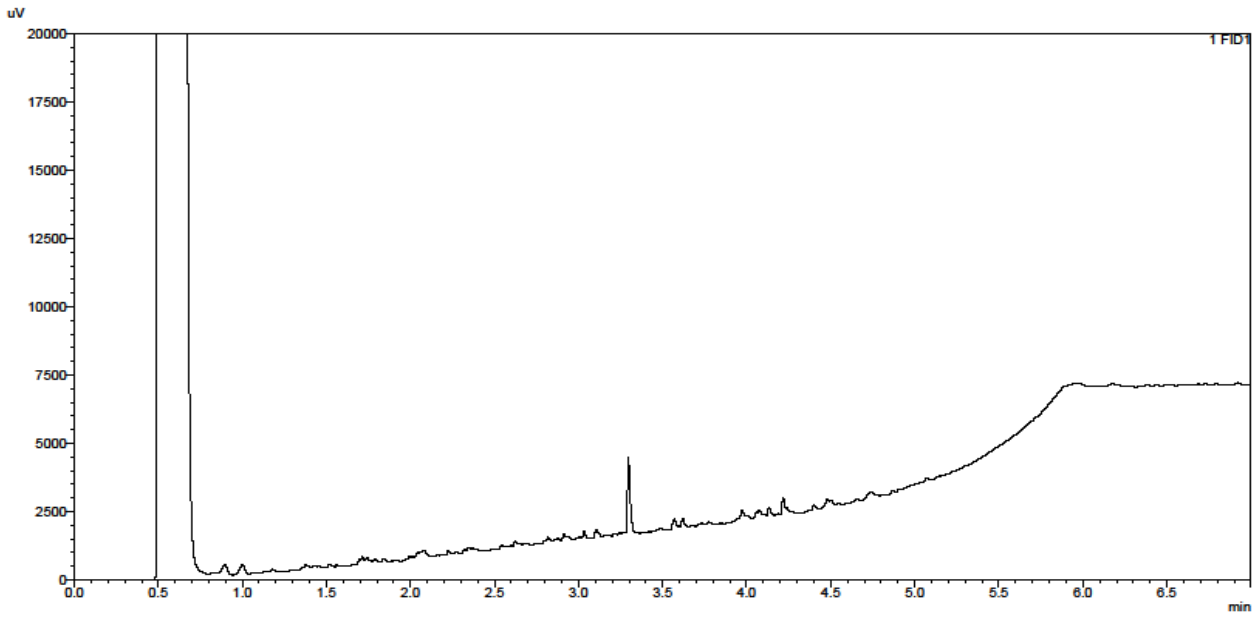


TPH Chromatogram on Soil Sample: 1033735

<Sample Information>

Sample Name : 1033735 20-18506
Data Filename : 30 July 2020_30072020_1033735 20-18506_022.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 22
Date Acquired : 30/07/2020 20:39:41
Date Processed : 30/07/2020

<Chromatogram>

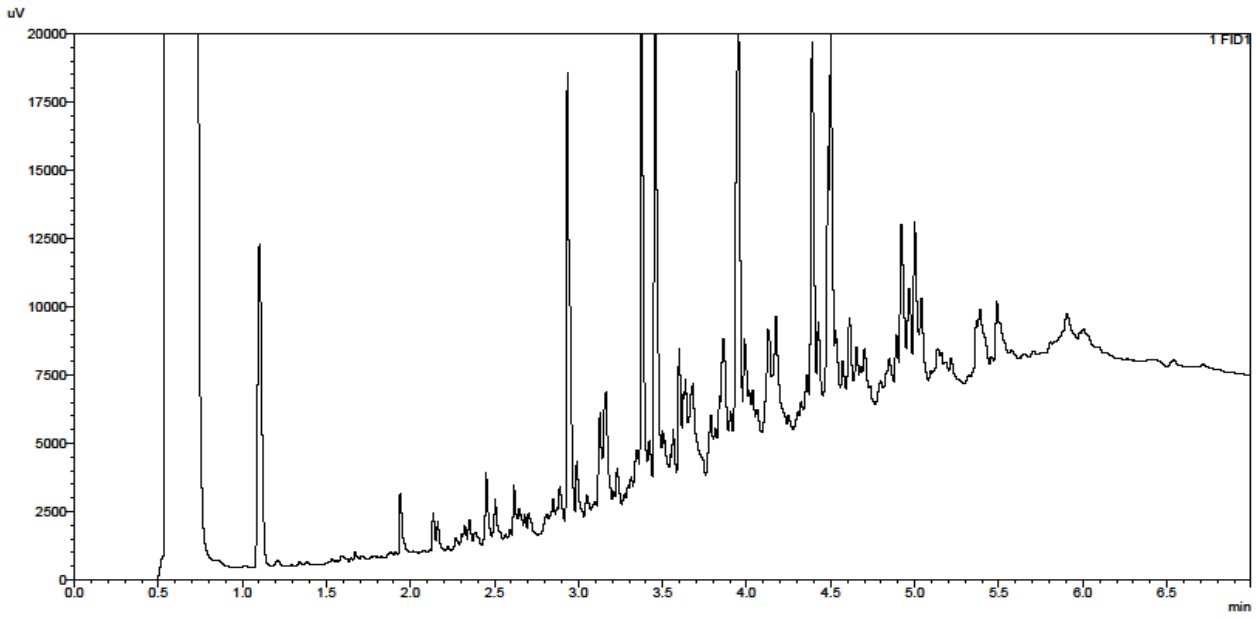


TPH Chromatogram on Soil Sample: 1033742

<Sample Information>

Sample Name : 1033742 20-18506
Data Filename : 23 July 2020_23072020_1033742 20-18506_075.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 38
Date Acquired : 23/07/2020 23:39:26
Date Processed : 23/07/2020

<Chromatogram>

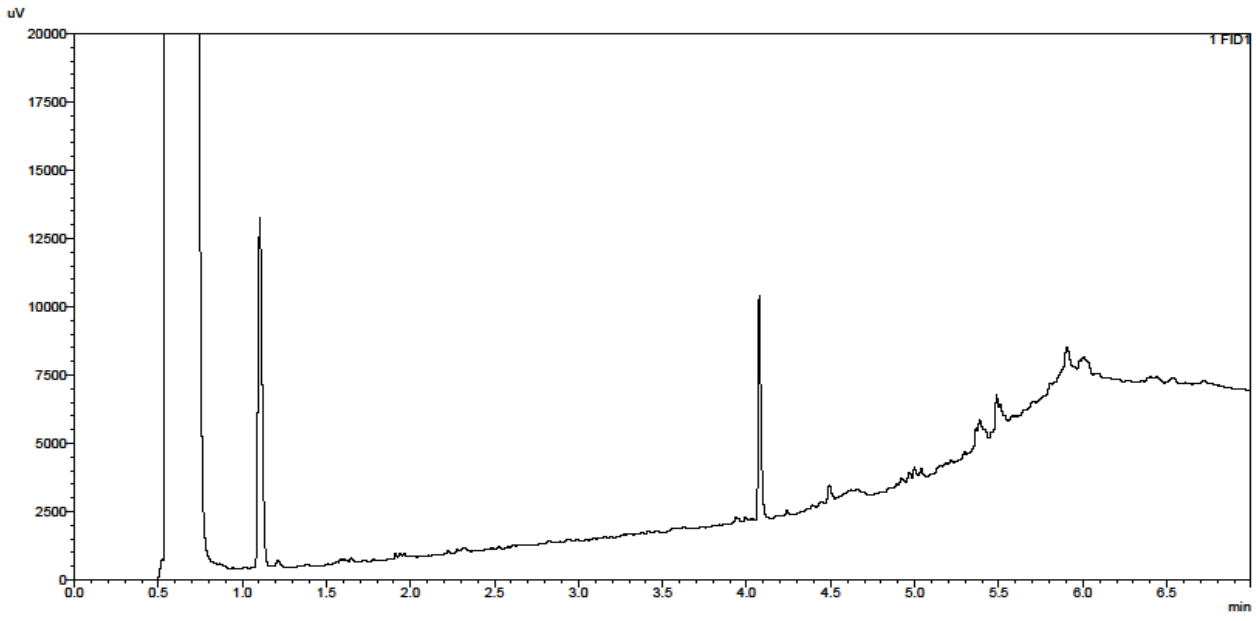


TPH Chromatogram on Soil Sample: 1033751

<Sample Information>

Sample Name : 1033751 20-18506
Data Filename : 23 July 2020_23072020_1033751 20-18506_077.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 39
Date Acquired : 23/07/2020 23:51:55
Date Processed : 23/07/2020

<Chromatogram>

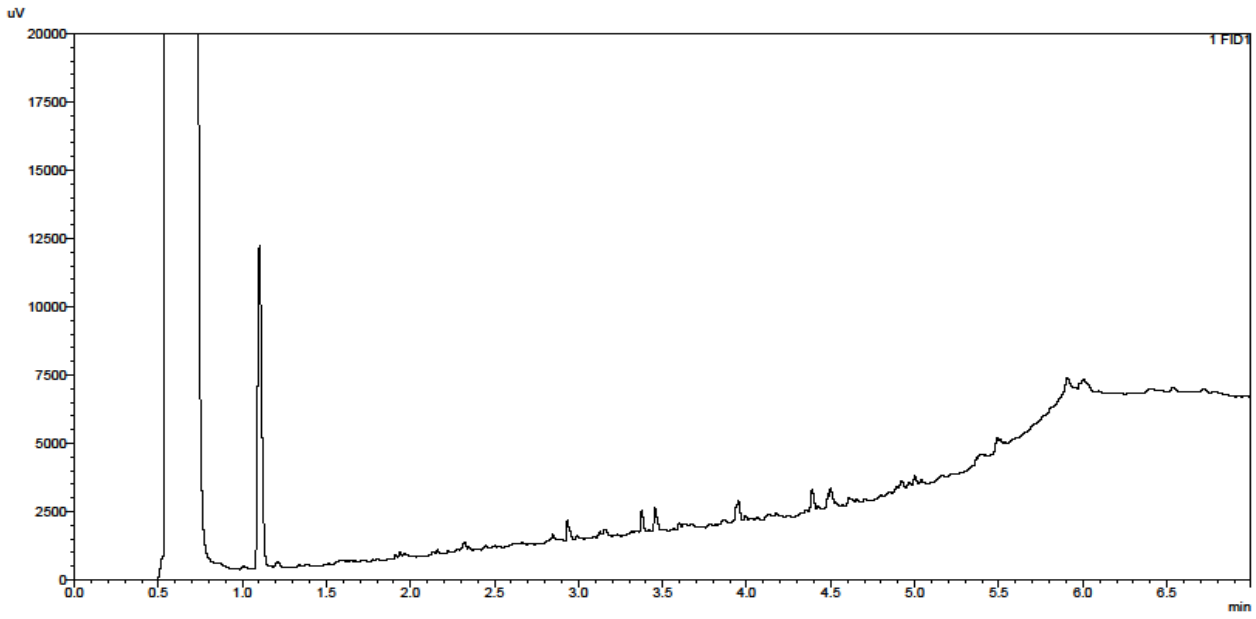


TPH Chromatogram on Soil Sample: 1033759

<Sample Information>

Sample Name : 1033759 20-18506
Data Filename : 23 July 2020_23072020_1033759 20-18506_079.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 40
Date Acquired : 24/07/2020 00:04:20
Date Processed : 24/07/2020

<Chromatogram>



TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
20-18506	1033725	S			WS2/D2	0.70		N/A
20-18506	1033735	S			WS13/D2	0.80		PAH
20-18506	1033742	2			TP119/D2	0.40	No	N/A
20-18506	1033742	S			TP119/D2	0.40	No	PAH
20-18506	1033751	S			TP112/D2	0.30		N/A
20-18506	1033759	S			TP101/D1	0.00		PAH

Test Methods

SOP	Title	Parameters included	Method summary
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2185	Asbestos	Asbestos	Polarised light microscopy
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by ‘Aquakem 600’ Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by ‘Aquakem 600’ Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18928-1
Initial Date of Issue:	31-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Contaminated Land Chris Hughes
Project	LKC 20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	22-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	3		
Turnaround (Wkdays):	7	**Results Due:**	30-Jul-2020
Date Approved:	31-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035787								
Sample Ref:									
Sample ID:	TP119/TP113						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	0.40								
Bottom Depth(m):	2.00								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			9.0	3	5	6
Loss On Ignition	2610	M	%			12	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			43	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			41	100	--	--
pH	2010	M				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.021	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0020	0.0028	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.029	0.023	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0016	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0032	0.0022	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.019	0.0078	< 0.050	0.092	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0019	0.0011	< 0.010	0.012	0.06	0.7	5
Selenium	1450	U	0.0013	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0020	0.0012	< 0.50	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.5	0.80	3.0	8.9	10	150	500
Sulphate	1220	U	18	4.3	36	60	1000	20000	50000
Total Dissolved Solids	1020	N	200	85	390	990	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	31	18	61	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.224

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035788								
Sample Ref:									
Sample ID:	TP110/TP108								
Sample Location:									
Top Depth(m):	0.10								
Bottom Depth(m):	1.10								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			5.2	3	5	6
Loss On Ignition	2610	M	%			8.6	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			340	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			94	100	--	--
pH	2010	M				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0015	0.0019	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.040	0.030	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0051	0.0031	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.019	0.013	< 0.050	0.14	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0023	0.0015	< 0.010	0.016	0.06	0.7	5
Selenium	1450	U	0.0012	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0046	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	1.9	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.4	1.0	2.8	11	10	150	500
Sulphate	1220	U	23	8.2	45	100	1000	20000	50000
Total Dissolved Solids	1020	N	180	91	350	1000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	30	21	59	220	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.224

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035789								
Sample Ref:									
Sample ID:	TP101						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	0.00								
Bottom Depth(m):	1.00								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			5.3	3	5	6
Loss On Ignition	2610	M	%			6.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			32	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			53	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.014	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0033	0.017	< 0.050	0.16	0.5	2	25
Barium	1450	U	0.039	0.0052	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0074	0.0057	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.011	0.0043	< 0.050	0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0022	0.0013	< 0.010	0.014	0.06	0.7	5
Selenium	1450	U	0.0017	0.0018	< 0.010	0.018	0.1	0.5	7
Zinc	1450	U	0.0023	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	4.2	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.89	0.39	1.8	4.4	10	150	500
Sulphate	1220	U	21	13	42	140	1000	20000	50000
Total Dissolved Solids	1020	N	160	78	320	870	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	30	18	60	190	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.194

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18988-1
Initial Date of Issue:	31-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Paul Quimby Contaminated Land
Project	LKC20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	20-Jul-2020
Order No.:	737854	**Date Instructed:**	23-Jul-2020
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	31-Jul-2020
Date Approved:	31-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18988								
Chemtest Sample ID:	1034168								
Sample Ref:									
Sample ID:	TP104/D2						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	0.70								
Bottom Depth(m):	1.30								
Sampling Date:	16-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			3.6	3	5	6
Loss On Ignition	2610	M	%			8.9	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.057	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0083	0.0056	< 0.050	0.057	0.5	2	25
Barium	1450	U	0.022	0.0090	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.012	0.0042	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.018	0.0084	< 0.050	0.087	0.5	10	30
Nickel	1450	U	0.0019	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	0.0051	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0027	0.0016	< 0.010	0.016	0.06	0.7	5
Selenium	1450	U	0.0014	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.011	0.0017	< 0.50	< 0.50	4	50	200
Chloride	1220	U	3.5	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.68	0.49	1.3	4.9	10	150	500
Sulphate	1220	U	91	25	180	280	1000	20000	50000
Total Dissolved Solids	1020	N	370	210	720	2200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	49	24	96	250	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	21

Leachate Test Information	
Leachant volume 1st extract/l	0.305
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.069

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18988								
Chemtest Sample ID:	1034178								
Sample Ref:									
Sample ID:	TP105/D2						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	1.10								
Bottom Depth(m):	2.10								
Sampling Date:	16-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			5.6	3	5	6
Loss On Ignition	2610	M	%			8.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			68	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.072	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0017	0.0011	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.032	0.058	< 0.50	0.56	20	100	300
Cadmium	1450	U	0.00011	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0017	0.0019	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.041	0.018	0.079	0.20	0.5	10	30
Nickel	1450	U	0.0013	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0029	0.0025	< 0.010	0.025	0.06	0.7	5
Selenium	1450	U	0.0023	0.0013	< 0.010	0.014	0.1	0.5	7
Zinc	1450	U	0.011	0.0035	< 0.50	< 0.50	4	50	200
Chloride	1220	U	2.4	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.81	0.51	1.6	5.3	10	150	500
Sulphate	1220	U	290	60	570	780	1000	20000	50000
Total Dissolved Solids	1020	N	500	250	970	2700	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	28	33	54	320	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	22

Leachate Test Information	
Leachant volume 1st extract/l	0.300
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.142

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18913-1		
Initial Date of Issue:	30-Jul-2020		
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Catherine Baranek Contaminated Land		
Project	LKC20 1120 Rochdale, Collyhurst		
Quotation No.:		**Date Received:**	15-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	4		
Turnaround (Wkdays):	7	**Results Due:**	30-Jul-2020
Date Approved:	30-Jul-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18913								
Chemtest Sample ID:	1032025								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP128/D2								
Top Depth(m):	0.50								
Bottom Depth(m):	0.90								
Sampling Date:	13-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			14	3	5	6
Loss On Ignition	2610	M	%			10	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			320	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			47	100	--	--
pH	2010	M				8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0020	0.0019	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.030	0.040	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0033	0.0025	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.030	0.016	0.059	0.18	0.5	10	30
Nickel	1450	U	0.0020	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0024	0.0020	< 0.010	0.020	0.06	0.7	5
Selenium	1450	U	0.0018	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0054	0.0032	< 0.50	< 0.50	4	50	200
Chloride	1220	U	2.8	1.0	< 10	12	800	15000	25000
Fluoride	1220	U	1.6	0.98	3.1	11	10	150	500
Sulphate	1220	U	51	18	100	220	1000	20000	50000
Total Dissolved Solids	1020	N	210	150	420	1600	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	30	26	59	260	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.311
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.223

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18913								
Chemtest Sample ID:	1032031								
Sample Ref:									
Sample ID:									
Sample Location:	TP131/D2								
Top Depth(m):	0.04								
Bottom Depth(m):	1.40								
Sampling Date:	13-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			5.3	3	5	6
Loss On Ignition	2610	M	%			6.9	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			43	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			34	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.014	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0040	0.0033	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.022	0.013	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	0.00013	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0048	0.0029	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.054	0.021	0.11	0.25	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0052	0.0028	0.010	0.031	0.06	0.7	5
Selenium	1450	U	0.0022	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.7	1.3	3.4	13	10	150	500
Sulphate	1220	U	14	4.8	28	58	1000	20000	50000
Total Dissolved Solids	1020	N	250	98	490	1100	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	28	19	56	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.326
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.197

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18913								
Chemtest Sample ID:	1032035								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP124/D1								
Top Depth(m):	0.10								
Bottom Depth(m):	1.10								
Sampling Date:	13-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			2.8	3	5	6
Loss On Ignition	2610	M	%			5.0	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			36	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			190	100	--	--
pH	2010	M				8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.024	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0051	0.0064	< 0.050	0.062	0.5	2	25
Barium	1450	U	0.073	0.12	< 0.50	1.1	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.018	0.012	< 0.050	0.13	0.5	10	70
Copper	1450	U	0.0062	0.0045	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.013	0.0039	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	0.013	0.018	0.026	0.17	0.5	10	50
Antimony	1450	U	0.0036	0.0024	< 0.010	0.025	0.06	0.7	5
Selenium	1450	U	0.0011	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0022	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	2.8	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.9	0.93	3.7	10	10	150	500
Sulphate	1220	U	37	11	73	140	1000	20000	50000
Total Dissolved Solids	1020	N	180	98	350	1100	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	28	67	55	620	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.197

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC20 1120 Rochdale, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18913								
Chemtest Sample ID:	1032040								
Sample Ref:									
Sample ID:									
Sample Location:	TP115/D2								
Top Depth(m):	0.20								
Bottom Depth(m):	1.20								
Sampling Date:	13-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			1.1	3	5	6
Loss On Ignition	2610	M	%			4.2	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			42	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	M				8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.021	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.041	0.073	< 0.50	0.71	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0024	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	< 0.0010	0.0013	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	0.0023	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0035	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	1.6	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.47	0.32	< 1.0	3.3	10	150	500
Sulphate	1220	U	36	12	71	140	1000	20000	50000
Total Dissolved Solids	1020	N	180	91	360	970	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	28	16	56	170	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.326
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.119

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-18928-1
Initial Date of Issue:	31-Jul-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Contaminated Land Chris Hughes
Project	LKC 20 1120 Rochdale Road, Collyhurst

Quotation No.:		**Date Received:**	22-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	3		
Turnaround (Wkdays):	7	**Results Due:**	30-Jul-2020
Date Approved:	31-Jul-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035787								
Sample Ref:									
Sample ID:	TP119/TP113						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	0.40								
Bottom Depth(m):	2.00								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			9.0	3	5	6
Loss On Ignition	2610	M	%			12	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			43	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			41	100	--	--
pH	2010	M				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.021	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0020	0.0028	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.029	0.023	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0016	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0032	0.0022	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.019	0.0078	< 0.050	0.092	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0019	0.0011	< 0.010	0.012	0.06	0.7	5
Selenium	1450	U	0.0013	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0020	0.0012	< 0.50	< 0.50	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.5	0.80	3.0	8.9	10	150	500
Sulphate	1220	U	18	4.3	36	60	1000	20000	50000
Total Dissolved Solids	1020	N	200	85	390	990	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	31	18	61	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.224

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035788								
Sample Ref:									
Sample ID:	TP110/TP108								
Sample Location:									
Top Depth(m):	0.10								
Bottom Depth(m):	1.10								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			5.2	3	5	6
Loss On Ignition	2610	M	%			8.6	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			340	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			94	100	--	--
pH	2010	M				8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.020	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0015	0.0019	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.040	0.030	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0051	0.0031	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.019	0.013	< 0.050	0.14	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0023	0.0015	< 0.010	0.016	0.06	0.7	5
Selenium	1450	U	0.0012	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0046	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	1.9	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.4	1.0	2.8	11	10	150	500
Sulphate	1220	U	23	8.2	45	100	1000	20000	50000
Total Dissolved Solids	1020	N	180	91	350	1000	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	30	21	59	220	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.224

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC 20 1120 Rochdale Road, Collyhurst

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	20-18928								
Chemtest Sample ID:	1035789								
Sample Ref:									
Sample ID:	TP101						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:									
Top Depth(m):	0.00								
Bottom Depth(m):	1.00								
Sampling Date:	15-Jul-2020								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			5.3	3	5	6
Loss On Ignition	2610	M	%			6.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	M	mg/kg			32	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			53	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.014	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0033	0.017	< 0.050	0.16	0.5	2	25
Barium	1450	U	0.039	0.0052	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0074	0.0057	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.011	0.0043	< 0.050	0.050	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0022	0.0013	< 0.010	0.014	0.06	0.7	5
Selenium	1450	U	0.0017	0.0018	< 0.010	0.018	0.1	0.5	7
Zinc	1450	U	0.0023	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	4.2	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.89	0.39	1.8	4.4	10	150	500
Sulphate	1220	U	21	13	42	140	1000	20000	50000
Total Dissolved Solids	1020	N	160	78	320	870	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	30	18	60	190	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.194

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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U	UKAS accredited
M	MCERTS and UKAS accredited
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>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix D

Certificates of Analysis - Groundwater

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	20-23983-1
Initial Date of Issue:	11-Sep-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Contaminated Land Chris Hughes Paul Quimby
Project	LKC 20 1120 Collyhurst Village

Quotation No.:		**Date Received:**	08-Sep-2020
Order No.:	737980	**Date Instructed:**	08-Sep-2020
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	14-Sep-2020
Date Approved:	11-Sep-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: LKC 20 1120 Collyhurst Village

Client: LK Consult			**Chemtest Job No.:**		20-23983
Quotation No.:			**Chemtest Sample ID.:**		1060985
			Client Sample ID.:		WS1
			Sample Type:		WATER
			Date Sampled:		07-Sep-2020
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
pH	U	1010		N/A	7.3
Sulphate	U	1220	mg/l	1.0	200
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050
Calcium	U	1415	mg/l	5.0	93
Total Hardness as CaCO3	U	1270	mg/l	15	570
Arsenic (Dissolved)	U	1450	µg/l	1.0	3.5
Boron (Dissolved)	U	1450	µg/l	20	430
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	11
Copper (Dissolved)	U	1450	µg/l	1.0	2.1
Manganese (Dissolved)	U	1450	µg/l	1.0	730
Nickel (Dissolved)	U	1450	µg/l	1.0	2.8
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	2.6
Vanadium (Dissolved)	U	1450	µg/l	1.0	2.9
Zinc (Dissolved)	U	1450	µg/l	1.0	9.3
Mercury Low Level	U	1460	µg/l	0.010	< 0.010
Chromium (Hexavalent)	U	1490	µg/l	20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	4.9
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10
Benzene	U	1760	µg/l	1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0

Results - Water

Project: LKC 20 1120 Collyhurst Village

Client: LK Consult			**Chemtest Job No.:**		20-23983
Quotation No.:			**Chemtest Sample ID.:**		1060985
			Client Sample ID.:		WS1
			Sample Type:		WATER
			Date Sampled:		07-Sep-2020
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Ethylbenzene	U	1760	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0
Naphthalene	N	1800	µg/l	0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010
Total Of 16 PAH's	N	1800	µg/l	0.10	< 0.10
Total Phenols	U	1920	mg/l	0.030	< 0.030

TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
20-23983	1060985	W			WS1		No	N/A

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	20-22645-1
Initial Date of Issue:	03-Sep-2020
Client	LK Consult
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS
Contact(s):	Chris Hughes Paul Quimby
Project	LKC 20 1120 Collyhurst Village

Quotation No.:		**Date Received:**	26-Aug-2020
Order No.:	737966	**Date Instructed:**	26-Aug-2020
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	02-Sep-2020
Date Approved:	03-Sep-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: LKC 20 1120 Collyhurst Village

Client: LK Consult		**Chemtest Job No.:**			20-22645	20-22645	20-22645	20-22645	20-22645
Quotation No.:		**Chemtest Sample ID.:**			1054423	1054424	1054425	1054426	1054427
			Client Sample ID.:		WS6 GW	WS8 GW	WS4 GW	WS5 GW	BH3 GW
			Sample Type:		WATER	WATER	WATER	WATER	WATER
			Date Sampled:		24-Aug-2020	24-Aug-2020	24-Aug-2020	24-Aug-2020	24-Aug-2020
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
pH	U	1010		N/A	7.5	7.3	7.3	7.4	7.6
Sulphate	U	1220	mg/l	1.0	230	210	370	380	60
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0	550	680	490	230	780
Total Hardness as CaCO3	U	1270	mg/l	15	1800	2100	1700	740	2100
Arsenic (Dissolved)	U	1450	µg/l	1.0	< 1.0	14	< 1.0	1.9	< 1.0
Boron (Dissolved)	U	1450	µg/l	20	71	260	27	240	35
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080	0.081	0.14
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	9.8	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	2.2	< 1.0	< 1.0	2.3	1.3
Manganese (Dissolved)	U	1450	µg/l	1.0	380	630	790	160	590
Nickel (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	19	< 1.0	1.4	6.5	< 1.0
Vanadium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0	9.1	7.2	9.3	10	2.3
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	4.1	2.7	2.0	4.5	3.8
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10	< 10	< 10
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: LKC 20 1120 Collyhurst Village

Client: LK Consult		**Chemtest Job No.:**			20-22645	20-22645	20-22645	20-22645	20-22645
Quotation No.:		**Chemtest Sample ID.:**			1054423	1054424	1054425	1054426	1054427
		Client Sample ID.:			WS6 GW	WS8 GW	WS4 GW	WS5 GW	BH3 GW
		Sample Type:			WATER	WATER	WATER	WATER	WATER
		Date Sampled:			24-Aug-2020	24-Aug-2020	24-Aug-2020	24-Aug-2020	24-Aug-2020
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Of 16 PAH's	N	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
20-22645	1054423	W			WS6 GW		No	N/A
20-22645	1054424	W			WS8 GW		No	N/A
20-22645	1054425	W			WS4 GW		No	N/A
20-22645	1054426	W			WS5 GW		No	N/A
20-22645	1054427	W			BH3 GW		No	N/A

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	20-18141-2		
Initial Date of Issue:	28-Jul-2020	**Date of Re-Issue:**	03-Sep-2020
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Chris Hughes Contaminated Land		
Project	LKC 20 1120 Rochdale Road, Collyhurst		
Quotation No.:		**Date Received:**	15-Jul-2020
Order No.:	737854	**Date Instructed:**	22-Jul-2020
No. of Samples:	9		
Turnaround (Wkdays):	31	**Results Due:**	03-Sep-2020
Date Approved:	03-Sep-2020		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Leachate

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**		20-18141
Quotation No.:				**Chemtest Sample ID.:**		1031999
				Client Sample ID.:		WS14B D2
				Sample Type:		SOIL
				Top Depth (m):		1.6
				Bottom Depth (m):		2.0
				Date Sampled:		13-Jul-2020
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**	
C2 Aliphatic TPH >C5-C6	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C6-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aliphatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	2300
C2 Aliphatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	1100
C2 Aliphatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	270
C2 Aliphatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	93
C2 Aliphatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	290
C2 Aliphatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	77
Total Aliphatic Hydrocarbons	N	1675	2:1	µg/l	5.0	4100
C2 Aromatic TPH >C5-C7	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C7-C8	N	1675	2:1	µg/l	0.10	< 0.10
C2 Aromatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	900
C2 Aromatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	730
C2 Aromatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	940
C2 Aromatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	550
C2 Aromatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	940
C2 Aromatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	94
C2 Total Aromatic Hydrocarbons	N	1675	2:1	µg/l	5.0	4200
Total Petroleum Hydrocarbons	N	1675	2:1	µg/l	10	8200
Total Organic Carbon	U	1610	2:1	mg/l	2.0	24
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	2:1	µg/l	1.0	< 1.0

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

Client: LK Consult				**Chemtest Job No.:**	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141
Quotation No.:				**Chemtest Sample ID.:**	1031984	1031985	1031986	1031991	1031995	1031998	1031999	1032000	1032001
				Client Sample ID.:	WS15 D1	WS15 D2	WS17 D1	WS18 D2	WS16 D2	WS14B D1	WS14B D2	WS14B D3	WS10 D1
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.0	0.8	0.6	0.4	1.5	0.4	1.6	4.0	0.0
				Bottom Depth (m):	0.7	1.0	1.0	1.0	1.5	1.0	2.0	4.5	0.3
				Date Sampled:	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020
				Asbestos Lab:	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-		-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	3.9	9.6	18	14	26	3.8	18	26	19
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Black	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Loam	Sand
Chromatogram (TPH)	N			N/A					See Attached		See Attached		
pH	M	2010		4.0	8.4	8.3	8.1	8.1	7.4	10.7	8.4		7.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40					0.50		1.8		
Magnesium (Water Soluble)	N	2120	g/l	0.010		< 0.010							
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	0.35	0.018	0.039	0.50	< 0.010		< 0.010
Chloride (Water Soluble)	M	2220	g/l	0.010		< 0.010							
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010							
Cyanide (Free)	M	2300	mg/kg	0.50					< 0.50		< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50					5.2		1.5		
Arsenic	M	2450	mg/kg	1.0	18		39	18	140	42	51		18
Cadmium	M	2450	mg/kg	0.10	1.2		0.54	0.29	0.68	0.63	0.77		1.5
Chromium	M	2450	mg/kg	1.0	4.4		16	22	33	33	24		290
Copper	M	2450	mg/kg	0.50	6.8		130	48	210	77	340		74
Mercury	M	2450	mg/kg	0.10	< 0.10		1.6	0.40	11	0.87	2.2		0.76
Nickel	M	2450	mg/kg	0.50	11		31	23	88	32	39		22
Lead	M	2450	mg/kg	0.50	29		430	300	600	470	500		250
Selenium	M	2450	mg/kg	0.20	< 0.20		0.60	0.36	1.4	< 0.20	0.75		0.58
Vanadium	U	2450	mg/kg	5.0	5.5		38	26	97	37	38		18
Zinc	M	2450	mg/kg	0.50	45		250	150	420	200	280		190
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50
Organic Matter	M	2625	%	0.40	3.5		6.9	3.8	38	5.0	22	13	4.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0		1.4	< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0		29	4.7	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0					< 1.0		84	8.6	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0					< 1.0		100	15	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0					< 1.0		230	77	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0					< 1.0		120	37	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0					< 5.0		570	140	

Results - Soil

Project: LKC 20 1120 Rochdale Road, Collyhurst

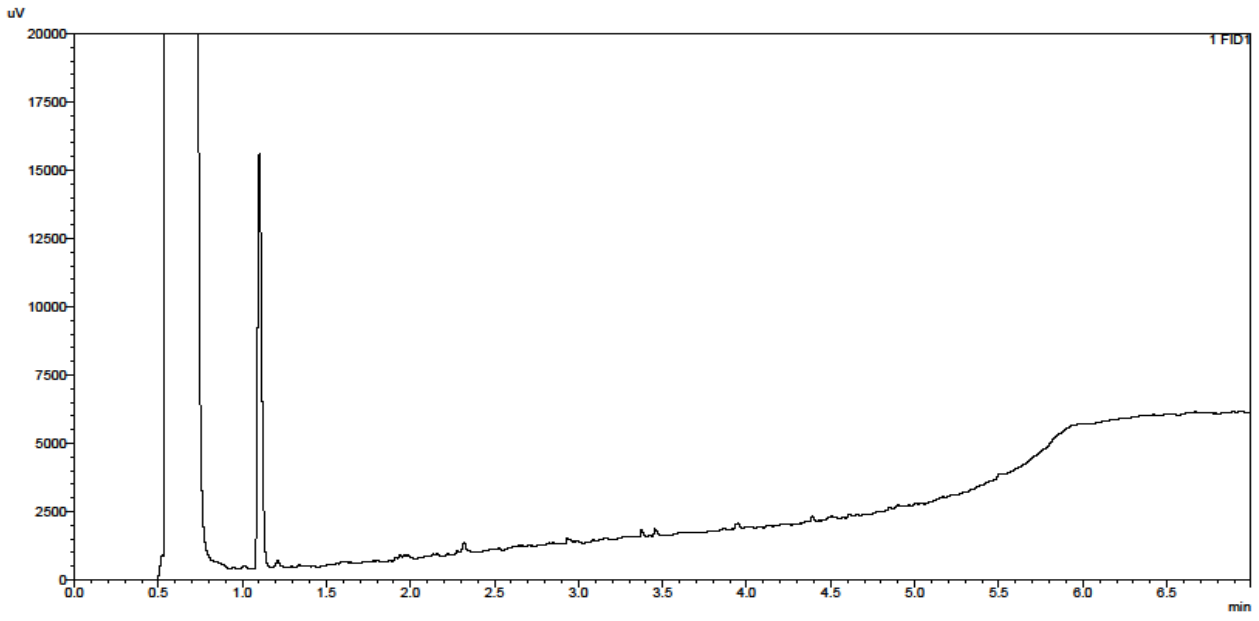
Client: LK Consult			**Chemtest Job No.:**		20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141	20-18141
Quotation No.:			**Chemtest Sample ID.:**		1031984	1031985	1031986	1031991	1031995	1031998	1031999	1032000	1032001
			Client Sample ID.:		WS15 D1	WS15 D2	WS17 D1	WS18 D2	WS16 D2	WS14B D1	WS14B D2	WS14B D3	WS10 D1
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.0	0.8	0.6	0.4	1.5	0.4	1.6	4.0	0.0
			Bottom Depth (m):		0.7	1.0	1.0	1.0	1.5	1.0	2.0	4.5	0.3
			Date Sampled:		13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020	13-Jul-2020
			Asbestos Lab:		DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0					< 1.0		< 1.0	< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0		23	< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0		88	14	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0					< 1.0		600	110	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0					< 1.0		2000	500	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0					< 1.0		6400	1800	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0					< 1.0		410	85	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0					< 5.0		9500	2500	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0					< 10		10000	2600	
Benzene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Toluene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0					< 1.0		< 1.0	< 1.0	
Naphthalene	M	2800	mg/kg	0.10	< 0.10		< 0.10	0.69	< 0.10	0.27	13		0.76
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10		< 0.10	0.29	< 0.10	0.12	6.0		0.12
Acenaphthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	1.5	< 0.10	0.25	110		2.8
Fluorene	M	2800	mg/kg	0.10	< 0.10		< 0.10	1.4	< 0.10	0.16	66		1.9
Phenanthrene	M	2800	mg/kg	0.10	0.16		< 0.10	12	1.5	2.2	450		11
Anthracene	M	2800	mg/kg	0.10	0.12		< 0.10	3.5	0.34	0.50	120		2.9
Fluoranthene	M	2800	mg/kg	0.10	0.26		< 0.10	19	2.5	4.2	510		13
Pyrene	M	2800	mg/kg	0.10	0.25		< 0.10	17	2.7	4.0	430		11
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.18		< 0.10	8.5	1.6	2.2	190		5.7
Chrysene	M	2800	mg/kg	0.10	0.20		< 0.10	7.7	1.5	2.1	190		5.3
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.26		< 0.10	10	2.4	3.2	210		6.8
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10		< 0.10	3.9	0.72	1.1	79		2.3
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.18		< 0.10	9.2	2.0	2.9	170		5.7
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.20		< 0.10	6.6	1.7	2.3	86		4.0
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.12		< 0.10	1.1	0.36	0.39	23		0.74
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.11		< 0.10	4.7	1.3	1.6	100		3.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.0		< 2.0	110	19	28	2800		77
Total Phenols	M	2920	mg/kg	0.30					< 0.30		< 0.30		

TPH Chromatogram on Soil Sample: 1031995

<Sample Information>

Sample Name : 1031995 20-18141
Data Filename : 24 July 2020_24072020_1031995 20-18141_075.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 38
Date Acquired : 24/07/2020 22:28:22
Date Processed : 24/07/2020

<Chromatogram>



TPH Chromatogram on Soil Sample: 1031999

<Sample Information>

Sample Name : 1031999 20-18141
Data Filename : 24 July 2020_24072020_1031999 20-18141_077.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 39
Date Acquired : 24/07/2020 22:40:54
Date Processed : 24/07/2020

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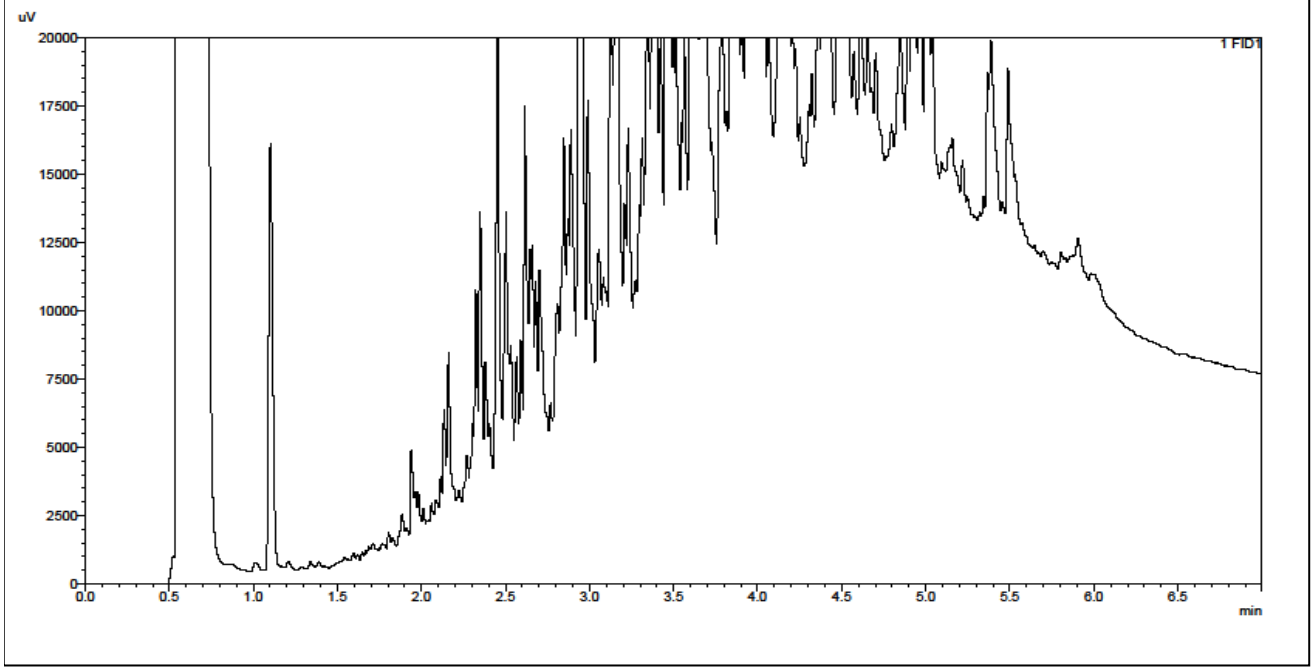


TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
20-18141	1031995	S			WS16 D2	1.5		N/A
20-18141	1031999	2			WS14B D2	1.6	No	Creosote
20-18141	1031999	S			WS14B D2	1.6	No	PAH
20-18141	1032000	S			WS14B D3	4.0		PAH

Test Methods

SOP	Title	Parameters included	Method summary
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix E

Gas Monitoring Results

LK CONSULT LTD

GAS MONITORING RECORD

SITE	Collyhurst Village, Manchester
REF	LKC 20 1120
DATE	10-Aug-2020
STAFF	EM/HM
VISIT	1 of 6

EQUIPMENT*1		
Instrument / Model Type	Serial Number	Comments
GFM 430	GAS0003	Serviced, calibrated & gas checked.
Geotech Dipmeter	81070	Operating Normally

ATMOSPHERIC / GROUND CONDITIONS	
Atmospheric Pressure Trend on Site	Variable
Atmospheric Pressure (Prev 24hrs)	Variable
Weather Conditions	Warm, dry, breezy
Ground Conditions	Dry

Borehole ID	Date/Time	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Peak CH4 (% v/v)	Peak CO2 (%v/v)	% of Lower Explosive Limit*2	CO Pod (ppm)	H2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow *3 (ltr/hr)	Standing Water Level (mbgl)	Installation Base Dip (mbgl)	Notes
WS1	10/08/2020	0.1	1.8	14.5	0.1	14.5		0.0	0.0	98.1	1010	0.0	1.52	2.95	
WS2	10/08/2020	0.0	0.0	19.7	0.0	0.2		0.0	0.0	80.1	1010	0.0	1.80	3.91	
WS3B	10/08/2020	0.0	0.1	20.5	0.0	0.1		0.0	0.0	79.4	1009	0.0	3.47	3.50	
WS4	10/08/2020	0.0	0.0	19.8	0.0	1.8		0.0	0.0	80.2	1010	0.0	1.04	3.67	
WS5	10/08/2020	0.0	0.1	20.3	0.0	0.1		0.0	0.0	79.6	1010	0.0	0.84	4.47	
WS6	10/08/2020	0.0	1.4	19.8	0.0	1.4		0.0	0.0	78.8	1010	0.0	1.67	2.89	
WS8	10/08/2020	0.0	2.2	18.1	0.0	2.2		0.0	0.0	79.7	1011	0.0	3.73	4.94	
WS9	10/08/2020	0.0	1.6	20.0	0.0	1.6		0.0	0.0	78.4	1008	0.0	DRY	3.01	
WS10	10/08/2020	0.0	4.1	14.4	0.0	4.1		0.0	0.0	81.5	1008	0.0	DRY	4.92	
WS11D	10/08/2020	0.0	1.5	20.0	0.0	1.5		0.0	0.0	78.5	1007	0.0	DRY	2.88	
WS12	10/08/2020	0.0	0.9	20.6	0.0	0.9		0.0	0.0	78.5	1008	0.0	3.81	3.99	Peak CO = 10ppm
WS13	10/08/2020	0.0	0.0	20.7	0.0	0.0		0.0	0.0	79.3	1009	0.0	3.93	3.94	
WS14B	10/08/2020	0.0	2.7	14.7	0.0	3.3		0.0	0.0	82.6	1010	0.0	DRY	4.93	
WS15	10/08/2020	0.1	2.0	16.2	0.1	2.0		0.0	0.0	81.7	1009	0.0	1.79	1.88	
WS16	10/08/2020	0.1	13.0	6.0	0.1	13.0		0.0	0.0	80.9	1007	0.0	DRY	4.91	
WS17	10/08/2020	0.1	2.3	16.0	0.1	2.3		0.0	0.0	81.6	1009	0.0	2.86	2.95	
WS18	10/08/2020	0.0	0.0	21.1	0.0	0.0		0.0	0.0	78.9	1009	0.0	DRY	3.96	
BH1	10/08/2020	0.0	4.2	8.3	0.0	4.2		0.0	0.0	87.5	1008	0.0	DRY	10.01	
BH2	10/08/2020	0.0	0.7	19.9	0.0	0.7		0.0	0.0	79.4	1008	0.0	DRY	8.04	
BH3	10/08/2020	0	1.8	18.2	0.0	1.8		0.0	0.0	80.0	1007	0.0	3.85	5.4	
BH4	10/08/2020	0.1	1.8	18.3	0	1.8		0.0	0.0	79.8	1009	0.0	9.57	9.69	

ABBREVIATIONS

*1	Refer to Note 1
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
% v/v	Percentage volume by total volume
ppm	Parts per million
mb	Millibars
ltr/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air
OEL	Occupational exposure limit

NOTES

1. Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records. and service certificates.
2. CH4 is explosive between the range of 5 - 15% v/v. 100% lower explosive limit is equal to 5% v/v CH4.
3. Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr)
4. After CIRIA C665. GSV = gas concentration (%) x flow rate. Peak CH4 and Steady CO2 values used.
5. Monitoring is carried out in line with procedures set by LKC Ltd with reference to CIRIA C665. Refer to procedural documents

LK CONSULT LTD

GAS MONITORING RECORD

SITE	Collyhurst Village
REF	LKC 20 1120
DATE	15th October 2020
STAFF	EM & NJ
VISIT	6 of 6

EQUIPMENT*[1]		
Instrument / Model Type	Serial Number	Comments
Geotechnical Instruments GA5000	G502417	Serviced, calibrated & gas checked.
Geotech Dipmeter	Blue-01	Operating Normally

ATMOSPHERIC / GROUND CONDITIONS	
Atmospheric Pressure Trend on Site	Rising then steady
Atmospheric Pressure (Prev 24hrs)	Rising
Weather Conditions	Sunny, chilly, dry
Ground Conditions	Damp

Borehole ID	Date/Time	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Peak CH4 (% v/v)	Peak CO2 (%v/v)	% of Lower Explosive Limit*2	CO Pod (ppm)	H2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow *3 (ltr/hr)	Standing Water Level (mbgl)	Installation Base Dip (mbgl)	Notes
BH1	15/10/2020 10:15	0.0	5.2	10.3	0.0	5.2	0.0	0.0	0.0	84.5	1022	0.0	9.78	9.83	Peak CO=8ppm, steady <1ppm.
BH2	15/10/2020 11:45	0.0	2.3	18.2	0.0	2.3	0.0	0.0	0.0	79.5	1022	0.0	DRY	7.96	
BH3	15/10/2020 11:22	0.0	1.8	17.7	0.0	1.8	0.0	0.0	0.0	80.4	1022	0.0	3.75	5.35	
BH4	15/10/2020 10:51	0.0	3.2	16.7	0.0	3.2	0.0	0.0	0.0	80.1	1021	0.0	9.48	9.62	Material around bung appears to have collapsed in.
WS1	15/10/2020 09:00	0.0	3.3	15.9	0.0	4.2	0.0	0.0	0.0	80.8	1021	0.0	2.38	2.87	Flow steady after monitoring for 2 minutes.
WS2	15/10/2020 09:36	0.1	1.1	16.0	0.1	1.1	0.2	0.0	0.0	82.8	1021	-0.1	1.36	3.86	Flow steady after monitoring for 4 minutes. Gas readings steady after 5 minutes.
WS3B	15/10/2020 09:19	0.0	0.9	20.7	0.0	0.9	0.0	0.0	0.0	78.4	1021	0.0	DRY	3.43	
WS4	15/10/2020 08:50	0.0	0.0	4.0	0.1	0.5	0.0	0.0	0.0	95.9	1021	-0.1	0.83	3.62	Flow steady after monitoring for 5 minutes. Gas readings steady after 5 minutes.
WS5	15/10/2020 10:00	0.1	0.6	20.4	0.1	0.6	0.2	0.0	0.0	78.9	1020	0.1	0.76	4.42	Peak CO=1ppm, steady<1ppm.
WS6	15/10/2020 10:30	0.0	0.2	21.6	0.0	1.5	0.0	0.0	0.0	78.1	1021	-0.1	0.59	2.82	Flow steady after 90 seconds..
WS8	15/10/2020 10:30	0.0	3.4	14.5	0.0	3.4	0.0	0.0	0.0	82.1	1021	0.0	3.27	4.87	
WS9	15/10/2020 11:44	0.0	2.5	18.7	0.0	2.5	0.0	0.0	0.0	78.8	1022	0.0	DRY	2.94	
WS10	15/10/2020 11:58	0.0	9.7	4.8	0.0	9.7	0.0	0.0	0.0	85.5	1022	0.0	DRY	4.86	Gas readings steady after 350 seconds.
WS11D	15/10/2020 11:30	0.0	1.1	20.2	0.0	1.1	0.0	0.0	0.0	78.7	1022	0.0	1.18	2.81	
WS12	15/10/2020 11:38	0.0	1.8	19.8	0.0	1.8	0.0	0.0	0.0	78.1	1022	0.0	3.85	3.92	
WS13	15/10/2020 12:10	0.0	0.7	20.7	0.0	0.7	0.0	0.0	0.0	78.5	1021	0.0	DRY	3.89	
WS14B	15/10/2020 11:00	0.0	4.2	15.4	0.0	9.1	0.0	0.0	0.0	80.4	1022	0.0	DRY	4.84	
WS15	15/10/2020 11:15	0.0	1.0	18.8	0.0	1.8	0.0	0.0	0.0	80.2	1022	0.0	1.62	1.88	
WS16	15/10/2020 11:07	0.0	10.8	6.6	0.0	10.8	0.0	0.0	0.0	82.6	1022	0.0	0.49	4.85	Peak CO=1ppm, steady<1ppm. Water flooded around bung.
WS17	15/10/2020 11:07	0.0	3.8	12.5	0.0	3.8	0.0	0.0	0.0	82.7	1023	0.0	2.87	2.88	
WS18	15/10/2020 11:07	UR	UR	UR	UR	UR	UR	UR	UR	UR	UR	UR	DRY	3.88	Unable to record, tap left open.

ABBREVIATIONS

*[1]	Refer to Note 1
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
% v/v	Percentage volume by total volume
ppm	Parts per million
mb	Millibars
ltr/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air
OEL	Occupational exposure limit

NOTES

1. Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records. and service certificates.
2. CH4 is explosive between the range of 5 - 15% v/v. 100% lower explosive limit is equal to 5% v/v CH4.
3. Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr)
4. After CIRIA C665. GSV = gas concentration (%) x flow rate. Peak CH4 and Steady CO2 values used.
5. Monitoring is carried out in line with procedures set by LKC Ltd with reference to CIRIA C665. Refer to procedural documents

LK CONSULT LTD

GAS MONITORING RECORD

SITE	Collyhurst
REF	LKC 20 1120
DATE	24-Aug-2020
STAFF	HM & RW
VISIT	2 of 6

EQUIPMENT*[1]		
Instrument / Model Type	**Serial Number**	**Comments**
Geotechnical Instruments GA5000	G502417	Serviced, calibrated & gas checked.
Geotech Dipmeter	81070	Operating Normally

ATMOSPHERIC / GROUND CONDITIONS	
Atmospheric Pressure Trend on Site	Variable
Atmospheric Pressure (Prev 24hrs)	Rising
Weather Conditions	Clear, warm, still
Ground Conditions	Wet

Borehole ID	Date/Time	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Peak CH4 (% v/v)	Peak CO2 (%v/v)	% of Lower Explosive Limit*2	CO Pod (ppm)	H2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow *3 (ltr/hr)	Standing Water Level (mbgl)	Installation Base Dip (mbgl)	Notes
WS4	24/08/2020 09:54	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	90.5	1007	0.3	0.80	3.67	Flow unsteady.
WS1	24/08/2020 10:02	0.0	3.3	14.3	0.0	3.3	0.0	0.0	0.0	82.3	1007	4.3	2.53	2.94	Peak CO= 1ppm
WS5	24/08/2020 10:13	0.0	0.5	19.4	0.0	0.5	0.0	1.0	0.0	80.1	1007	0.0	0.76	4.42	Peak CO= 2ppm
WS2	24/08/2020 10:21	0.0	0.0	20.8	0.0	0.2	0.0	2.0	0.0	79.1	1007	0.0	1.57	3.92	Peak CO= 2ppm
WS3B	24/08/2020 11:23	0.0	0.9	19.9	0.0	0.9	0.0	0.0	0.0	79.2	1007	0.0	3.44	3.54	
WS13	24/08/2020 11:32	0.0	0.8	20.8	0.0	0.8	0.0	1.0	0.0	78.8	1007	0.2	3.95	3.98	
BH1	24/08/2020 11:44	0.0	0.2	20.9	0.0	0.3	0.0	0.0	0.0	78.9	1007	0.0	Dry	9.91	
WS6	24/08/2020 11:55	0.0	1.1	19.8	0.0	1.1	0.0	2.0	0.0	79.1	1007	0.0	0.84	2.90	
WS8	24/08/2020 12:37	0.0	2.2	16.6	0.0	2.2	0.0	3.0	0.0	81.2	1008	0.0	3.80	4.95	
WS12	24/08/2020 13:15	0.0	1.4	20.2	0.1	1.4	0.0	0.0	0.0	78.4	1008	0.0	3.81	4.01	
WS11d	24/08/2020 13:23	0.0	1.3	20.2	0.1	1.3	0.0	0.0	0.0	78.4	1008	0.0	Dry	2.85	
BH3	24/08/2020 13:33	0.0	0.2	21.0	0.1	0.2	0.0	2.0	0.0	78.8	1008	0.0	3.88	5.39	
WS16	24/08/2020 13:56	0.0	7.5	14.0	0.0	7.5	0.0	1.0	0.0	78.5	1008	0.0	Dry	4.91	
WS14B	24/08/2020 14:07	0.0	6.1	12.4	0.0	6.3	0.0	2.0	0.0	81.5	1008	0.2	Dry	4.93	
WS10	24/08/2020 14:16	0.0	11.1	1.8	0.0	11.1	0.0	2.0	0.0	87.1	1008	-0.1	Dry	4.94	
BH2	24/08/2020 14:27	0.0	2.7	17.4	0.0	2.7	0.0	9.0	0.0	80.0	1008	0.0	Dry	8.23	
WS9	24/08/2020 14:35	0.0	2.5	17.5	0.1	2.5	0.0	2.0	0.0	80.0	1008	-0.2	Dry	2.99	
WS15	24/08/2020 14:51	0.0	0.4	20.4	0.0	1.1	0.0	2.0	0.0	79.2	1008	0.0	1.71	1.87	
BH4	24/08/2020 14:59	0.0	6.9	13.8	0.0	6.8	0.0	9.0	0.0	79.4	1008	-0.2	9.62	9.71	
WS17	24/08/2020 15:08	0.0	2.5	17.4	0.0	2.5	0.0	2.0	0.0	80.1	1008	-0.1	2.89	2.94	Ran for 200 seconds.
WS18	24/08/2020 15:18	0.0	0.1	21.2	0.0	0.1	0.0	3.0	0.0	78.7	1008	0.0	Dry	3.97	

ABBREVIATIONS

*[1]	Refer to Note 1
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
% v/v	Percentage volume by total volume
ppm	Parts per million
mb	Millibars
ltr/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air
OEL	Occupational exposure limit

LK CONSULT LTD

GAS MONITORING RECORD

SITE	Collyhurst
REF	LKC 20 1120
DATE	7-Sep-2020
STAFF	RW & EM
VISIT	3 of 6

EQUIPMENT*[1]		
Instrument / Model Type	**Serial Number**	**Comments**
Geotechnical Instruments GA5000	G502417	Serviced, calibrated & gas checked.
Geotech Dipmeter	81070	Operating Normally
Geotech Dipmeter	Blue-01	Operating Normally
Geotechnical Instruments GA2000+	GA10350	Serviced, calibrated & gas checked.

ATMOSPHERIC / GROUND CONDITIONS	
Atmospheric Pressure Trend on Site	Steady
Atmospheric Pressure (Prev 24hrs)	Rising
Weather Conditions	Cloudy, mild, breezy
Ground Conditions	Wet

Borehole ID	Date/Time	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Peak CH4 (% v/v)	Peak CO2 (%v/v)	% of Lower Explosive	CO Pod (ppm)	H2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow *3 (ltr/hr)	Standing Water Level (mbgl)	Installation Base Dip (mbgl)	Notes
WS4	07/09/2020 09:53	0.1	0.0	6.2	0.1	0.0	0.0	0.0	0.0	93.8	1012	0.0	0.81	3.68	
BH1	07/09/2020 10:31	0.0	1.1	19.1	0.0	1.1	0.0	2.0	0.0	79.8	1012	0.0	9.79	9.82	CO steady = 1
BH2	07/09/2020 11:00	0.0	3.6	16.1	0.0	3.6	0.0	2.0	0.0	80.3	1012	0.0	Dry	7.96	
BH3	07/09/2020 11:40	0.0	2.0	17.9	0.0	2.0	0.0	1.0	0.0	80.1	1012	0.0	3.85	5.34	
BH4	07/09/2020 09:50	0.1	3.9	17.0	0.1	3.6	0.0	0.0	0.0	79.1	1012	0.0	9.61	9.78	
WS1	07/09/2020 11:00	0.1	3.8	12.7	0.1	3.8	0.0	5.0	0.0	83.5	1012	0.1	2.32	2.90	Flow still falling after 60 seconds. CO steady = 0
WS10	07/09/2020 11:28	0.1	5.4	13.4	0.1	6.1	0.0	0.0	0.0	81.2	1012	0.0	Dry	4.95	
WS11d	07/09/2020 11:28	0.0	1.8	19.7	0.0	1.8	0.0	1.0	0.0	78.5	1012	0.0	Dry	2.81	CO steady = 1
WS12	07/09/2020 10:19	0.1	1.7	19.3	0.1	1.7	0.0	0.0	0.0	79.0	1012	0.0	4.80	4.99	
WS13	07/09/2020 10:47	0.1	0.9	19.8	0.1	0.9	0.0	0.0	0.0	79.3	1012	0.0	3.95	3.95	
WS14B	07/09/2020 10:47	0.0	5.4	13.6	0.1	5.4	0.0	0.0	0.0	80.9	1012	0.0	Dry	4.85	
WS15	07/09/2020 12:06	0.0	0.5	20.6	0.1	0.9	0.0	2.0	0.0	78.9	1012	0.0	1.53	1.68	CO steady = 0
WS16	07/09/2020 11:51	0.1	9.0	10.4	0.1	9.0	0.0	1.0	0.0	80.6	1012	0.0	Dry	4.91	CO steady = 0
WS17	07/09/2020 12:06	0.1	2.9	16.0	0.1	2.9	0.0	0.0	0.0	81.1	1012	0.0	2.88	2.95	
WS18	07/09/2020 12:20	0.0	4.2	14.9	0.0	4.2	0.0	4.0	0.0	80.9	1012	0.0	Dry	3.98	No well cover. CO steady = 0
WS2	07/09/2020 10:19	0.0	0.1	20.8	0.0	0.4	0.0	1.0	0.0	29.1	1012	0.0	1.45	3.86	CO steady = 0
WS3B	07/09/2020 10:04	0.0	1.2	19.9	0.0	1.2	0.0	3.0	0.0	78.9	1012	0.0	3.43	3.43	CO steady = 0
WS5	07/09/2020 10:31	0.1	0.5	19.1	0.1	5.0	0.0	8.0	0.0	80.4	1012	0.0	0.76	4.47	CO steady = 0
WS6	07/09/2020 10:47	0.1	0.1	20.7	0.1	0.5	0.0	1.0	0.0	79.2	1012	0.0	1.69	2.88	CO steady = 0
WS8	07/09/2020 11:14	0.1	3.7	15.1	0.1	3.9	0.0	4.0	0.0	81.2	1012	0.0	3.54	4.95	Ran for 230 seconds, reading not steady. CO steady = 0
WS9	07/09/2020 11:14	0.1	3.2	17.0	0.1	3.2	0.0	1.0	0.0	79.8	1012	0.0	Dry	3.01	

ABBREVIATIONS

*[1]	Refer to Note 1
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
% v/v	Percentage volume by total volume
ppm	Parts per million
mb	Millibars
ltr/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air
OEL	Occupational exposure limit

NOTES

1. Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records. and service certificates.
2. CH4 is explosive between the range of 5 - 15% v/v. 100% lower explosive limit is equal to 5% v/v CH4.
3. Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr)
4. After CIRIA C665. GSV = gas concentration (%) x flow rate. Peak CH4 and Steady CO2 values used.
5. Monitoring is carried out in line with procedures set by LKC Ltd with reference to CIRIA C665. Refer to procedural documents

LK CONSULT LTD

GAS MONITORING RECORD

SITE	Collyhurst Village
REF	LKC 20 1120
DATE	28-Sep-2020
STAFF	RW & NJ
VISIT	4 of 6

EQUIPMENT*[1]		
Instrument / Model Type	Serial Number	Comments
Geotechnical Instruments GA5000	G502417	Serviced, calibrated & gas checked.
Geotech Dipmeter	Blue-01	Operating Normally

ATMOSPHERIC / GROUND CONDITIONS	
Atmospheric Pressure Trend on Site	Rising
Atmospheric Pressure (Prev 24hrs)	Falling
Weather Conditions	Cloudy, still, cold
Ground Conditions	28-Sep-20

Borehole ID	Date/Time	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	Peak CH4 (% v/v)	Peak CO2 (%v/v)	% of Lower Explosive Limit*2	CO Pod (ppm)	H2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow *3 (ltr/hr)	Standing Water Level (mbgl)	Installation Base Dip (mbgl)	Notes
BH1	28/09/2020	0.0	4.7	13.4	0.0	4.7	0.0	0.0	0.0	81.7	1006	0.0	9.78	9.82	
BH2	28/09/2020	0.0	1.1	20.2	0.0	1.5	0.0	0.0	0.0	78.7	1007	0.0	Dry	7.99	
BH3	28/09/2020	0.0	1.8	19.6	0.0	1.8	0.0	0.0	0.0	78.3	1007	0.1	4.88	5.34	
BH4	28/09/2020	0.0	4.0	17.2	0.0	4.3	0.0	0.0	0.0	78.7	1006	0.0	Dry	9.60	
WS1	28/09/2020	0.0	4.3	13.7	0.0	4.3	0.0	1.0	0.0	81.9	1006	0.0	2.65	2.88	
WS2	28/09/2020	0.1	0.2	20.9	0.1	0.5	0.0	2.0	0.0	78.9	1004	-0.1	1.79	3.25	
WS4	28/09/2020	0.1	0.0	4.6	0.1	0.1	0.0	0.0	0.0	95.3	1006	0.0	1.21	3.61	
WS5	28/09/2020	0.1	0.6	19.8	0.1	0.6	0.0	3.0	0.0	79.6	1005	0.0	0.90	4.41	
WS6	28/09/2020	0.0	2.2	18.8	0.0	2.2	0.0	2.0	0.0	78.9	1006	0.0	1.11	2.82	
WS8	28/09/2020	0.0	3.8	15.8	0.0	4.0	0.0	0.0	0.0	80.4	1007	0.2	3.63	4.82	
WS9	28/09/2020	0.0	2.6	18.6	0.0	2.6	0.0	0.0	0.0	78.8	1007	0.0	Dry	2.95	
WS10	28/09/2020	0.0	3.5	17.3	0.0	3.6	0.0	1.0	0.0	79.3	1007	0.0	Dry	4.85	
WS11d	28/09/2020	0.0	1.2	20.8	0.0	1.2	0.0	2.0	0.0	78.0	1007	0.0	Dry	2.79	
WS12	28/09/2020	0.0	1.4	20.5	0.0	1.4	0.0	0.0	0.0	78.1	1007	0.0	3.83	4.12	
WS13	28/09/2020	0.0	0.8	20.8	0.0	0.8	0.0	1.0	0.0	78.4	1006	0.0	Dry	3.88	
WS3B	28/09/2020	0.0	1.0	20.8	0.0	1.0	0.0	3.0	0.0	78.2	1006	0.0	Dry	3.41	
WS14b	28/09/2020	0.0	4.3	16.6	0.0	4.3	0.0	0.0	0.0	79.1	1007	0.0	Dry	3.90	
WS15	28/09/2020	0.0	0.5	20.6	0.0	1.7	0.0	0.0	0.0	78.9	1007	0.0	Dry	1.80	
WS16	28/09/2020	0.1	10.1	9.1	0.1	10.1	0.2	0.0	0.0	80.7	1007	0.0	Dry	4.83	
WS17	28/09/2020	0.0	3.6	14.4	0.0	3.6	0.0	0.0	0.0	82.0	1007	0.0	At base	2.88	
WS18	28/09/2020	0.0	4.8	15.2	0.0	3.8	0.0	4.0	0.0	80.0	1007	0.1	Dry	3.88	

ABBREVIATIONS

*[1]	Refer to Note 1
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
% v/v	Percentage volume by total volume
ppm	Parts per million
mb	Millibars
ltr/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air
OEL	Occupational exposure limit

NOTES

1. Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records. and service certificates.
2. CH4 is explosive between the range of 5 - 15% v/v. 100% lower explosive limit is equal to 5% v/v CH4.
3. Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr)
4. After CIRIA C665. GSV = gas concentration (%) x flow rate. Peak CH4 and Steady CO2 values used.
5. Monitoring is carried out in line with procedures set by LKC Ltd with reference to CIRIA C665. Refer to procedural documents

LK CONSULT

LK CONSULT LTD

GAS MONITORING RECORD

Site	Collyhurst Village
Job Number	LKC 20 1120
Date	07.10.2020
Engineer	NJ and EM
Visit	5 of 6

Equipment[1]		
Instrument	**Serial Number**	**Comments**
Gas Analyser GA5000	G502417	Serviced, calibrated, gas checked.
Geotech Dipmeter	Blue-01	Operating normally.

Atmospheric / Ground Conditions	
Atmospheric pressure trend onsite	Rising
Atmospheric pressure (prev 24hrs)	Rising
Weather Conditions	ermittent showers, overcast and sun
Ground Conditions	Wet

Borehole ID	Date & Time	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	Peak CH_4 (%v/v)	Peak CO_2 (%v/v)	% LEL[2]	CO Pod (ppm)	H_2S Pod (ppm)	Balance (%)	Barometric Pressure (mb)	Internal Flow[3] (l/hr)	Standing water level (mbgl)	Installation base depth (mbgl)	Notes
BH1	07.10.2020 11.00am	0	5.3	6.9	0	5.3	0	0	0	87.8	1004	-0.7	Damp	9.83	Water flooded around tap, removed before monitoring.
BH2	07.10.2020 12.00pm	0	2.9	16.6	0	3	0	0	0	80.4	1005	0.1	Dry	7.98	
BH3	07.10.2020 12.33am	0	1.8	18.3	0	1.9	0	0	0	79.8	1005	0	3.82	5.34	
BH4	07.10.2020 12.50pm	0	7.2	12.5	0	7.2	0	0	0	80.3	1006	0	9.09	9.6	Material around bung appears to have collapsed in.
WS1	07.10.2020 10.12am	0	4.3	14.2	0	4.3	0	0	0	81.5	1003	0	2.56	2.89	
WS2	07.10.2020 10.02am	0	0.1	20.5	0.1	0.6	2	0	0	78.7	1003	-0.1	1.3	3.86	Peak CO=2ppm. Peak flow=-0.1l/hr.
WS3B	07.10.2020 10.45am	0	1	20.9	0	1	0	0	0	78.1	1003	0	Dry	3.43	
WS4	07.10.2020 10.22am	0.1	0	3.5	0.1	0.5	2	0	0	96.5	1003	0.1	0.78	3.61	
WS5	07.10.2020 9.52am	0	0	19.8	0.1	0.6	0	0	0	79.4	1002	-0.2	0.75	4.43	Peak CO=3ppm.
WS6	07.10.2020 10.53am	0	0.2	20.7	0	1.1	0	0	0	78.1	1004	0	0.54	2.82	
WS8	07.10.2020 11.10am	0	6.8	0.5	0	6.8	0	0	0	92.7	1004	0	3.38	4.87	
WS9	07.10.2020 12.09pm	0	2.6	16	0	3.2	0	0	0	79	1005	-0.1	Dry	2.95	
WS10	07.10.2020 11.48am	0	1.1	19.9	0	1.1	0	0	0	79	1004	0	Dry	4.86	
WS11	07.10.2020 12.24pm	0	1.4	20	0	1.4	0	0	0	78.6	1005	0	Dry	2.8	
WS12	07.10.2020 12.15pm	0	1.7	19.3	0	1.7	0	0	0	79	1005	0	3.86	3.93	
WS13	07.10.2020 10.35pm	0	0.8	20.6	0	0.8	0	0	0	78.1	1003	0	Dry	3.89	
WS14B	07.10.2020 11.41am	0	2.5	18.7	0.1	0	2	0	0	78.8	1004	0	Dry	4.85	
WS15	07.10.2020 12.59pm	0	1.4	18.2	0	1.4	0	0	0	79.1	1006	0	1.61	1.8	
WS16	07.10.2020 12.40pm	0	10.6	8	0	10.7	0	0	0	81.4	1005	0	Dry	4.84	
WS17	07.10.2020 1306pm	0	3.7	12.8	0	3.7	0	0	0	83.5	1006	-0.1	2.86	2.88	CO Peak=1ppm.
WS18	07.10.2020 13.15pm	0	5.2	13.8	0	5.2	0	0	0	81	1006	0.1	Dry	3.88	

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES

All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.

[1]Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.

[2]CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.

[3]Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).

Appendix F

Soakaway Testing Results

Tests Failed

LK GROUP

LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Soakaway Test (BRE Digest 365)

Site : Collyhurst Village, Manchester

Client : Far East Consortium International Limited

Project Contractor : LKC

Job Number LKC 20 1120

Sheet 1 / 4

Location	Date	Level	Location
SA101	22/07/2020	58.15 mOD	E: 385648 N: 400367

Pit Width (m)	0.60
Pit Depth (m)	2.70
Pit Length (m)	2.00

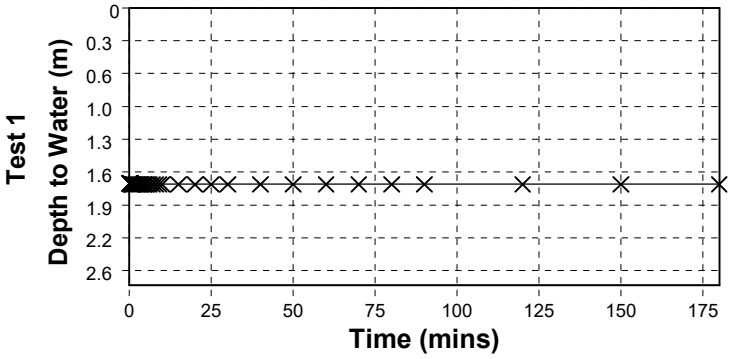
Soil type at test level	Clay
Groundwater	2.70 m
Drain discharge depth	2.70
Sidewall stability	Stable
Stone filled or open pit	Stone filled

	1
Effective depth (m)	0.99
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms-1), f	Test Failed

Remarks

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.71
0.083	1.71
0.167	1.71
0.333	1.71
0.5	1.72
0.667	1.72
0.833	1.72
1	1.72
1.5	1.72
2	1.72
2.5	1.72
3	1.72
3.5	1.72
4	1.72
4.5	1.72
5	1.72
6	1.72
7	1.72
8	1.72
9	1.72
10	1.72
15	1.72
20	1.72
25	1.72
30	1.72
40	1.72
50	1.72
60	1.72
70	1.72
80	1.72
90	1.72
120	1.72
150	1.72
180	1.72



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Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Soakaway Test (BRE Digest 365)

Site : Collyhurst Village, Manchester

Client : Far East Consortium International Limited

Project Contractor : LKC

Job Number LKC 20 1120

Sheet 2 / 4

Location	Date	Level	Location
SA103	23/07/2020	59.70 mOD	E: 385571 N: 400330

Pit Width (m)	0.60
Pit Depth (m)	2.10
Pit Length (m)	2.00

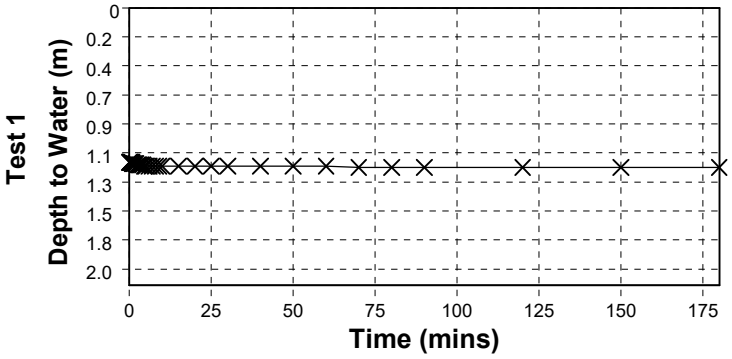
Soil type at test level	Clay
Groundwater	None
Drain discharge depth	
Sidewall stability	Stable
Stone filled or open pit	Stone filled

	1
Effective depth (m)	0.93
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms-1), f	Test Failed

Remarks

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.17
0.083	1.17
0.167	1.17
0.333	1.17
0.5	1.17
0.667	1.17
0.833	1.18
1	1.18
1.5	1.18
2	1.18
2.5	1.19
3	1.19
3.5	1.19
4	1.19
4.5	1.20
5	1.20
6	1.20
7	1.20
8	1.20
9	1.20
10	1.20
15	1.20
20	1.20
25	1.20
30	1.20
40	1.20
50	1.20
60	1.20
70	1.21
80	1.21
90	1.21
120	1.21
150	1.21
180	1.21



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Soakaway Test (BRE Digest 365)

Site : Collyhurst Village, Manchester

Client : Far East Consortium International Limited

Project Contractor : LKC

Job Number LKC 20 1120

Sheet 3 / 4

Location	Date	Level	Location
SA104	23/07/2020	58.68 mOD	E: 385538 N: 400283

Pit Width (m)	0.60
Pit Depth (m)	2.00
Pit Length (m)	2.00

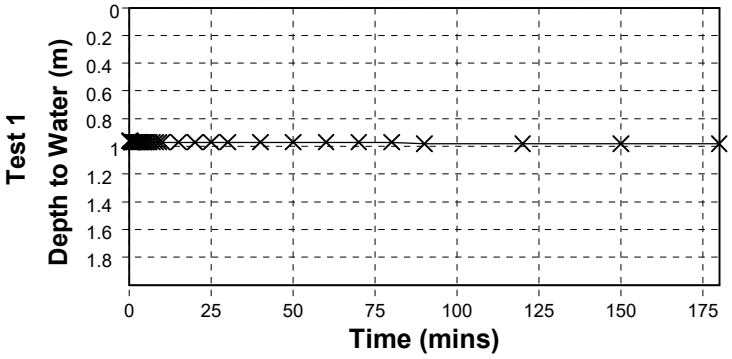
Soil type at test level	Clay
Groundwater	N/A
Drain discharge depth	2.0
Sidewall stability	Stable
Stone filled or open pit	Stone filled

	1
Effective depth (m)	1.04
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms-1), f	Test Failed

Remarks

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	0.96
0.083	0.96
0.167	0.96
0.333	0.96
0.5	0.97
0.667	0.97
0.833	0.97
1	0.97
1.5	0.97
2	0.97
2.5	0.97
3	0.97
3.5	0.97
4	0.97
4.5	0.97
5	0.97
6	0.97
7	0.97
8	0.97
9	0.97
10	0.97
15	0.97
20	0.97
25	0.97
30	0.97
40	0.97
50	0.97
60	0.97
70	0.97
80	0.97
90	0.98
120	0.98
150	0.98
180	0.98



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Tel: 0161 763 7200 web: www.thelkgroup.com

Soakaway Test (BRE Digest 365)

Site : Collyhurst Village, Manchester

Client : Far East Consortium International Limited

Project Contractor : LKC

Job Number LKC 20 1120

Sheet 4 / 4

Location	Date	Level	Location
SA106	23/07/2020	55.83 mOD	E: 385517 N: 400211

Pit Width (m)	0.60
Pit Depth (m)	2.00
Pit Length (m)	2.00

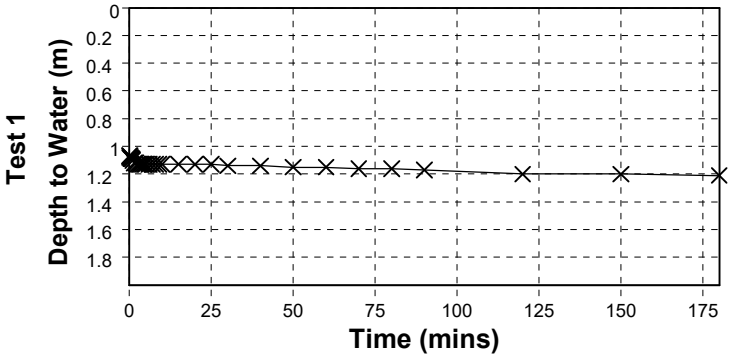
Soil type at test level	Clay
Groundwater	None
Drain discharge depth	2.0
Sidewall stability	Stable
Stone filled or open pit	Stone filled

	1
Effective depth (m)	0.93
Volume outflowing between 75% & 25% (m3)*	
Mean surface area through which outflow occurs (m2)	
Time for outflow between 75% & 25% (min)	
SOIL INFILTRATION RATE (ms-1), f	Test Failed

Remarks

* Volume outflowing reduced to account for granular backfill used during testing (30 % of free volume assumed).

Elapsed time (mins)	Depth to Water Test 1
0	1.07
0.083	1.07
0.167	1.08
0.333	1.08
0.5	1.09
0.667	1.09
0.833	1.09
1	1.10
1.5	1.12
2	1.12
2.5	1.13
3	1.13
3.5	1.13
4	1.13
4.5	1.13
5	1.13
6	1.13
7	1.13
8	1.13
9	1.13
10	1.13
15	1.13
20	1.13
25	1.13
30	1.14
40	1.14
50	1.15
60	1.15
70	1.16
80	1.16
90	1.17
120	1.20
150	1.20
180	1.21



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Appendix G

Generic Assessment Criteria Values

Category 4 Screening Levels (C4SL)

Substance	Residential (with home-grown produce)	Residential (without home-grown produce)	Allotments	Commercial	Public Open Space 1	Public Open Space 2
Arsenic	37 mg/kg	40 mg/kg	49 mg/kg	640 mg/kg	79 mg/kg	168 mg/kg
Benzene	0.87 mg/kg	3.3 mg/kg	0.18 mg/kg	98 mg/kg	140 mg/kg	230 mg/kg
Benzo(a)pyrene	5 mg/kg	5.3 mg/kg	5.7 mg/kg	76 mg/kg	10 mg/kg	21 mg/kg
Cadmium	26 mg/kg	149 mg/kg	4.9 mg/kg	410 mg/kg	220 mg/kg	880 mg/kg
Chromium VI	21 mg/kg	21 mg/kg	170 mg/kg	49 mg/kg	23 mg/kg	250 mg/kg
Lead	200 mg/kg	310 mg/kg	80 mg/kg	2330 mg/kg	630 mg/kg	1300 mg/kg

Summary Table for the Generic Assessment Criteria for Human Health Risk Assessment Land Quality Management (LQM) S4ULs.

All GAC are based on sandy loam soils with a pH 7.

	Contaminant	SOM	LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
			Res +	Res -	Allot.	Comm.	POS_{resi}	POS_{park}
Metals	Inorganic Arsenic	6%	37	40	43	640	79	170
	Beryllium	6%	1.7	1.7	35	12	2.2	63
	Boron	6%	290	11,000	45	240,000	21,000	46,000
	Cadmium	6%	11	85	1.9	190	120	532
	Chromium (III)	6%	910	910	18,000	8,600	1,500	33,000
	Chromium (VI)	6%	6.0	6.0	1.8	33	7.7	220
	Copper	6%	2,400	7,100	520	68,000	12,000	44,000
	Elemental Mercury	6%	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}
	Inorganic Mercury	6%	40	56	19	1,100	120	240
	Methylmercury	6%	11	15	6.0	320	40	68
	Nickel	6%	180	180	230	980	230	3,400
	Selenium	6%	250	430	88	12,000	1,100	1,800
	Vanadium	6%	410	1,200	91	9,000	2,000	5,000
	Zinc	6%	3,700	40,000	620	730,000	81,000	170,000
BTEX Compounds	Benzene	1%	0.087	0.38	0.017	27	72	90
		2.5%	0.17	0.70	0.034	47	72	100
		6%	0.37	1.4	0.075	90	73	110
	Toluene	1%	130	880 (869) ^{vap}	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}
		2.5%	290	1,900	51	110,000 (1,920) ^{vap}	56,000	95,000 (1,920) ^{vap}
		6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360) ^{vap}
	Ethylbenzene	1%	47	83	16	5,700 (518) ^{vap}	24,000	17,000 (518) ^{vap}
		2.5%	110	190	39	13,000 (1,220) ^{vap}	24,000	22,000 (1,220) ^{vap}
		6%	260	440	91	27,000 (2,840) ^{vap}	25,000	27,000 (2,840) ^{vap}
	o-xylene	1%	60	88	28	6,600 (478) ^{sol}	41,000	17,000 (478) ^{sol}
		2.5%	140	210	67	15,000 (1,120) ^{sol}	42,000	24,000 (1,120) ^{sol}
		6%	330	480	160	33,000 (2,620) ^{sol}	43,000	33,000 (2,620) ^{sol}
	m-xylene	1%	59	82	31	6,200 (625) ^{vap}	41,000	17,000 (625) ^{vap}
		2.5%	140	190	74	14,000 (1,470) ^{vap}	42,000	24,000 (1,470) ^{vap}
		6%	320	450	170	31,000 (3,460) ^{vap}	43,000	32,000 (3,460) ^{vap}
	p-xylene	1%	56	79	29	5,900 (576) ^{sol}	41,000	17,000 (576) ^{sol}
		2.5%	130	180	69	14,000 (1,350) ^{sol}	42,000	23,000 (1,350) ^{sol}
		6%	310	430	160	30,000 (3,170) ^{sol}	43,000	31,000 (3,170) ^{sol}

NOTES

$^{Sol / vap}$ = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

	Contaminant	SOM	LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
			Res +	Res -	Allot.	Comm.	POS_{resi}	POS_{park}
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000
		2.5%	5,400	35,000	950	540,000	74,000	150,000
		6%	11,000	37,000	2,200	540,000	74,000	150,000
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49
		2.5%	11	14	6.5	170	29	56
		6%	13	15	13	180	29	62
	Benzo(a)pyrene (only)	1%	2.2	3.2	0.97	35	5.7	11
		2.5%	2.7	3.2	2.0	35	5.7	12
		6%	3.0	3.2	3.5	36	5.7	13
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13
		2.5%	3.3	4.0	2.1	44	7.2	15
		6%	3.7	4.0	3.9	45	7.2	16
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400
		2.5%	340	360	470	4,000	640	1,500
		6%	350	360	640	4,000	640	1,600
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370
		2.5%	93	110	75	1,200	190	410
		6%	100	110	130	1,200	190	440
	Chrysene	1%	15	30	4.1	350	57	93
		2.5%	22	31	9.4	350	57	110
		6%	27	32	19	350	57	120
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3
		6%	0.3	0.32	0.43	3.6	0.58	1.4
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300
		2.5%	560	1,600	130	23,000	3,100	6,300
		6%	890	1,600	290	23,000	3,100	6,400
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150
		2.5%	36	46	21	510	82	170
		6%	41	46	39	510	82	180
	Naphthalene	1%	2.3 ^{f}	2.3 ^{f}	4.1 ^{f}	190 ^{f} (76.4) ^{sol}	4,900 ^{f}	1,200 ^{f} (76.4) ^{sol}
		2.5%	5.6 ^{f}	5.6 ^{f}	10 ^{f}	460 ^{f} (183) ^{sol}	4,900 ^{f}	1,900 ^{f} (183) ^{sol}
		6%	13 ^{f}	13 ^{f}	24 ^{f}	1,100 ^{f} (432) ^{sol}	4,900 ^{f}	3,000
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200
		2.5%	220	1,500	38	22,000	3,100	6,200
		6%	440	1,500	90	22,000	3,100	6,300
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000
		2.5%	1,200	3,800	270	54,000	7,400	15,000
		6%	2,000	3,800	620	54,000	7,400	15,000
	Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4
		2.5%	0.98	1.2	0.67	15	2.2	4.7
		6%	1.1	1.2	1.2	15	2.2	4.8

NOTES

$^{sol / vap}$ = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = naphthalene is based on comparison of inhalation exposure with TDI_{inhal} for localised effect.

All GAC are based on sandy loam soils with a pH 7.

LQM Generic Assessment Criteria (mg/kg) Dry weight soil

	Contaminant	SOM	Res +	Res -	Allot.	Comm.	POS_{resi}	POS_{park}
Petroleum Hydrocarbons	**Aliphatic**							
	EC 5-6	1%	42	42	730	3,200 (304) sol	570,000(304) sol	95,000 (304) sol
	EC>6-8	1%	100	100	2,300	7,800 (144) sol	600,000	150,000 (144) sol
	EC>8-10	1%	27	27	320	2,000 (78) sol	13,000	14,000 (78) vap
	EC>10-12	1%	130 (48) vap	130 (48) vap	2,200	9,700 (48) sol	13,000	21,000 (48) vap
	EC>12-16	1%	1,100 (24) sol	1,100 (24) sol	11,000	59,000 (24) sol	13,000	25,000 (24) sol
	EC>16-35	1%	65,000 (8.48) f,sol	65,000 (8.48) f,sol	260,000 f	160,000 f	250,000 f	450,000 f
	EC>35-44	1%	65,000 (8.48) f,sol	65,000 (8.48) f,sol	260,000 f	160,000 f	250,000 f	450,000 f
	Aliphatic							
	EC 5-6	2.5%	78	78	1,700	5,900 (558) sol	590,000	130,000 (558) sol
	EC>6-8	2.5%	230	230	5,600	17,000 (322) sol	610,000	220,000 (322) sol
	EC>8-10	2.5%	65	65	770	4,800 (190) vap	13,000	18,000 (190) vap
	EC>10-12	2.5%	330 (118) vap	330 (118) vap	4,400	23,000 (118) vap	13,000	23,000 (118) vap
	EC>12-16	2.5%	2,400 (59) sol	2,400 (59) sol	13,000	82,000 (59) sol	13,000	25,000 (59) sol
	EC>16-35	2.5%	92,000 (21) f,sol	92,000 (21) f,sol	270,000 f	1,700,000 f	250,000 f	480,000 f
	EC>35-44	2.5%	92,000 (21) f,sol	92,000 (21) f,sol	270,000 f	1,700,000 f	250,000 f	480,000 f
	Aliphatic							
	EC 5-6	6%	160	160	3,900	12,000 (1,150) sol	600,000	180,000 (1,150) sol
	EC>6-8	6%	530	530	13,000	40,000 (736) sol	620,000	320,000 (736) sol
	EC>8-10	6%	150	150	1,700	11,000 (451) vap	13,000	21,000 (451) vap
	EC>10-12	6%	760 (283) vap	760 (283) vap	7,300	47,000 (283) vap	13,000	24,000 (283) vap
	EC>12-16	6%	4,300 (142) sol	4,400 (142) sol	13,000	90,000 (142) sol	13,000	26,000 (142) sol
	EC>16-35	6%	110,000 f	110,000 f	270,000 f	1,800,000 f	250,000 f	490,000 f
	EC>35-44	6%	110,000 f	110,000 f	270,000 f	1,800,000 f	250,000 f	490,000 f
	Aromatic							
	EC5-7(benzene as non-threshold)	1%	70	370	13	26,000 (1,220) sol	56,000	76,000 (1,220) sol
	EC>7-8(toluene)	1%	130	860	22	56,000 (869) vap	56,000	87,000 (869) vap
	EC>8-10	1%	34	47	8.6	3,500 (613) vap	5,000	7,200 (613) vap
	EC>10-12	1%	74	250	13	16,000 (364) sol	5,000	9,200 (364) sol
	EC>12-16	1%	140	1,800	23	36,000 (169) sol	5,100	10,000
	EC>16-21	1%	260 f	1,900 f	46 f	28,000 f	3,800 f	7,600 f
	EC>21-35	1%	1,100 f	1,900 f	370 f	28,000 f	3,800 f	7,800 f
	EC>35-44	1%	1,100 f	1,900 f	370 f	28,000 f	3,800 f	7,800 f
	Aromatic							
	EC5-7(benzene as non-threshold)	2.5%	140	690	27	46,000 (2,260) sol	56,000	84,000 (2,260) sol
	EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) sol	56,000	95,000 (1,920) sol
	EC>8-10	2.5%	83	110	21	8,100 (1,500) vap	5,000	8,500 (1,500) vap
	EC>10-12	2.5%	180	590	31	28,000 (899) sol	5,000	9,700 (899) sol
	EC>12-16	2.5%	330	2,300 (419) sol	57	37,000	5,100	10,000
	EC>16-21	2.5%	540 f	1,900 f	110 f	28,000 f	3,800 f	7,700 f
	EC>21-35	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f
	EC>35-44	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f
	Aromatic							
	EC5-7(benzene as non-threshold)	6%	300	1,400	57	86,000 (4,710) sol	56,000	92,000 (4,710) sol
	EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) vap	56,000	100,000 (4,360) vap
	EC>8-10	6%	190	270	51	17,000 (3,580) vap	5,000	9,300 (3,580) vap
	EC>10-12	6%	380	1,200	4	34,000 (2,150) sol	5,000	10,000
	EC>12-16	6%	660	2,500	130	38,000	5,100	10,000
	EC>16-21	6%	930 f	1,900 f	260 f	28,000 f	3,800 f	7,800 f
	EC>21-35	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f
	EC>35-44	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f
	Aliphatic +Aromatic >EC44	1%	1,600 f	1,900 f	1,200 f	28,000 f	3,800 f	7,800 f
		2.5%	1,800 f	1,900 f	2,100 f	28,000 f	3,800 f	7,800 f
		6%	1,900 f	1,900 f	3,000 f	28,000 f	3,800 f	7,900 f

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

	Contaminant	SOM	LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
			Res +	Res -	Allot.	Comm.	POS_{resi}	POS_{park}
Chloalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	7.1E-03	9.2E-03	4.6E-03	0.67	29	21
		2.5%	1.1E-02	1.3E-02	8.3E-03	0.97	29	24
		6%	1.9E-02	2.3E-02	1.6E-02	1.7	29	28
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) vap
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) vap
		6%	39	40	240	3,000	140,000	100,000 (6,392) vap
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800
		2.5%	3.4	8.0	0.89	550	1,400	2,100
		6%	7.5	17	2.0	1,100	1,400	2,300
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500
		2.5%	2.8	3.5	1.9	250	1,400	1,800
		6%	6.4	8.2	4.4	560	1,400	2,100
	Tetrachloroethene (PCE)	1%	0.18	0.18	0.65	19	1,400	810 (424) sol
		2.5%	0.39	0.40	1.5	42	1,400	1,100 (951) sol
		6%	0.90	0.92	3.6	95	1,400	1,500
	Tetrachloromethane (carbon tetrachloride)	1%	2.6E-02	2.6E-02	0.45	2.9	890	190
		2.5%	5.6E-02	5.6E-02	1.0	6.3	920	270
		6%	0.13	0.13	2.4	14	950	400
	Trichloroethene (TCE)	1%	1.6E-02	1.7E-02	4.1E-02	1.2	120	70
		2.5%	3.4E-02	3.6E-02	9.1E-02	2.6	120	91
		6%	7.5E-02	8.0E-02	0.21	5.7	120	120
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600
		2.5%	1.7	2.1	0.83	170	2,500	2,800
		6%	3.4	4.2	1.7	350	2,500	3,100
	Chloroethene (vinyl chloride)	1%	6.4E-04	7.7E-04	5.5E-04	5.9E-02	3.5	4.8
		2.5%	8.7E-04	1.0E-03	1.0E-03	7.7E-02	3.5	5.0
		6%	1.4E-03	1.5E-03	1.8E-03	0.12	3.5	5.4
	2,4,6-Trinitritoluene (TNT)	1%	1.6	65	0.24	1,000	130	260
		2.5%	3.7	66	0.58	1,000	130	270
		6%	8.1	66	1.4	1,000	130	270
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) sol
		2.5%	250	13,000	38	210,000	26,000	51,000
		6%	540	13,000	85	210,000	27,000	53,000
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) vap
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) vap
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) vap
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30
		2.5%	6.6	7.4	6.1	170	18	31
		6%	7.1	7.5	9.8	170	18	31
	Dieldrin	1%	0.97	7.0	0.17	170	18	30
		2.5%	2.0	7.3	0.41	170	18	30
		6%	3.5	7.4	0.96	170	18	31
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300
		2.5%	7.8	620	1.2	9,400	1,200	2,400
		6%	17.4	620	2.7	9,400	1,200	2,400
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26
		6%	0.14	6.6	2.2E-02	140	16	27
	Endosulfanns (2 isomers)	1%	7.4	160 (3.0E-03) vap	1.2	5,600 (3.0E-03) vap	1,200	2,300
		2.5%	18	280 (7.0E-03) vap	2.9	7,400 (7.0E-03) vap	1,200	2,400
		6%	41	410 (1.6E-02) vap	6.8	8,400 (1.6E-02) vap	1,200	2,500
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15
		2.5%	0.2	3.8	3.2E-02	65	8.1	15
		6%	0.46	3.8	7.7E-02	65	8.1	16

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

All GAC are based on sandy loam soils with a pH 7.

	Contaminant	SOM	LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
			Res +	Res -	Allot.	Comm.	POS_{resi}	POS_{park}
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}
		6%	2.4	2.4	32	290	14,000	2,900
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190
		6%	22	38	7.0	830	100	190
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^{g}	94	0.13 ^{g}	3,500	620	1,100
		2.5%	2.0	150	0.30	4,000	620	1,100
		6%	4.5	210	0.70	4,300	620	1,100
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110
		2.5%	0.52	29	8.0E-02	400	60	120
		6%	1.2	31	0.19	400	60	120
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300
		2.5%	0.29	0.29	10	22	11,000	1,900
		6%	0.62	0.62	23	47	11,000	2,700
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48
		2.5%	0.7	0.78	0.61	66	25	50
		6%	1.6	1.8	1.4	120	25	51
	Phenol	1%	280	750	66	760 ^{dir} (31,000)	760 ^{dir} (11,000)	760 ^{dir} (8,600)
		2.5%	550	1,300	140	1,500 ^{dir} (35,000)	1,500 ^{dir} (11,000)	1,500 ^{dir} (9,700)
		6%	1,100	2,300	280	3,200 ^{dir} (37,000)	3,200 ^{dir} (11,000)	3,200 ^{dir} (11,000)

NOTES

$^{Sol / vap}$ = solubility / vapour limit (potentially use if free product identified, although highly conservative).

^{dir} = S4uls based on threshold protective of direct skin contact with phenol (brackets long term exposure for illustration purposes).

^{g} = derived based on 2,3,4,6-tetrachlorophenol.

Appendix H

Hazard Index Spreadsheets

$$HI = \sum_{Fi=1}^{16} HQ\ Fi = \frac{\text{Measured concentration Fi (mg/kg)}}{\text{S4UL Fi (mg/kg)}}$$

where: HI = Hazard Index
HQ = Hazard Quotient
Fi = Fraction I
S4UL = LQM Suitable 4 Use Levels (S4ULs)

Job Collyhurst Village, Manchester
Job No. LKC 20 1120
SOM 6%
Comment WS14B D3 4.0-4.5m

POS - Residential

	1% S4UL	2.50% SS4UL	6% S4UL	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	570000	590000	600000	1	1.754E-06	1.695E-06	1.667E-06
EC6-EC8	600000	610000	620000	1	1.667E-06	1.639E-06	1.613E-06
EC8-EC10	13000	13000	13000	1	7.692E-05	7.692E-05	7.692E-05
EC10-EC12	13000	13000	13000	4.7	0.0003615	0.0003615	0.0003615
EC12-EC16	13000	13000	13000	8.6	0.0006615	0.0006615	0.0006615
EC16-EC21	250000	250000	250000	15	0.00006	0.00006	0.00006
EC21-EC35				77			
EC35-EC44	250000	250000	250000	37	0.000148	0.000148	0.000148
Aromatic							
EC5-EC7 (benzene)	56000	56000	56000	0.001	1.786E-08	1.786E-08	1.786E-08
EC7-EC8 (tolulene)	56000	56000	56000	0.001	1.786E-08	1.786E-08	1.786E-08
EC8-EC10	5000	5000	5000	1	0.0002	0.0002	0.0002
EC10-EC12	5000	5000	5000	14	0.0028	0.0028	0.0028
EC12-EC16	5100	5100	5100	110	0.0215686	0.0215686	0.0215686
EC16-EC21	3800	3800	3800	500	0.1315789	0.1315789	0.1315789
EC21-EC35	3800	3800	3800	1800	0.4736842	0.4736842	0.4736842
EC35-EC44	3800	3800	3800	85	0.0223684	0.0223684	0.0223684
				HI	**0.65**	**0.65**	**0.65**

$$HI = \sum_{Fi=1}^{16} HQ\ Fi = \frac{\text{Measured concentration Fi (mg/kg)}}{\text{S4UL Fi (mg/kg)}}$$

where: HI = Hazard Index
HQ = Hazard Quotient
Fi = Fraction I
S4UL = LQM Suitable 4 Use Levels (S4ULs)

Job Collyhurst Village, Manchester
Job No. LKC 20 1120
SOM 1%
Comment

TP112 D2 0.3-1.0m

Residential With Plant Uptake

	1% S4UL	2.50% S4UL	6% S4UL	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	42	78	160	1	0.0238095	0.0128205	0.00625
EC6-EC8	100	230	530	1	0.01	0.0043478	0.0018868
EC8-EC10	27	65	150	1	0.037037	0.0153846	0.0066667
EC10-EC12	130	330	760	1	0.0076923	0.0030303	0.0013158
EC12-EC16	1100	2400	4300	1	0.0009091	0.0004167	0.0002326
EC16-EC21	65000	92000	110000	37	0.0005692	0.0004022	0.0003364
EC21-EC35							
EC35-EC44	65000	92000	110000	1	1.538E-05	1.087E-05	9.091E-06
Aromatic							
EC5-EC7 (benzene)	70	140	300	0.001	1.429E-05	7.143E-06	3.333E-06
EC7-EC8 (tolulene)	130	290	660	0.001	7.692E-06	3.448E-06	1.515E-06
EC8-EC10	34	83	190	1	0.0294118	0.0120482	0.0052632
EC10-EC12	74	180	380	1	0.0135135	0.0055556	0.0026316
EC12-EC16	140	330	660	1	0.0071429	0.0030303	0.0015152
EC16-EC21	260	540	930	1	0.0038462	0.0018519	0.0010753
EC21-EC35	1100	1500	1700	180	0.1636364	0.12	0.1058824
EC35-EC44	1100	1500	1700	1	0.0009091	0.0006667	0.0005882
				HI	**0.30**	**0.18**	**0.13**

$$HI = \sum_{Fi=1}^{16} HQ\ Fi = \frac{\text{Measured concentration Fi (mg/kg)}}{\text{S4UL Fi (mg/kg)}}$$

where: HI = Hazard Index
HQ = Hazard Quotient
Fi = Fraction I
S4UL = LQM Suitable 4 Use Levels (S4ULs)

Job Collyhurst Village, Manchester
Job No. LKC 20 1120
SOM 6%
Comment TP117 D2 0.2-1.2m

POS - Residential

	1% S4UL	2.50% SS4UL	6% S4UL	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	570000	590000	600000	1	1.754E-06	1.695E-06	1.667E-06
EC6-EC8	600000	610000	620000	1	1.667E-06	1.639E-06	1.613E-06
EC8-EC10	13000	13000	13000	1	7.692E-05	7.692E-05	7.692E-05
EC10-EC12	13000	13000	13000	1	7.692E-05	7.692E-05	7.692E-05
EC12-EC16	13000	13000	13000	1	7.692E-05	7.692E-05	7.692E-05
EC16-EC21	250000	250000	250000	1	0.000004	0.000004	0.000004
EC21-EC35				1			
EC35-EC44	250000	250000	250000	130	0.00052	0.00052	0.00052
Aromatic							
EC5-EC7 (benzene)	56000	56000	56000	0.001	1.786E-08	1.786E-08	1.786E-08
EC7-EC8 (tolulene)	56000	56000	56000	0.001	1.786E-08	1.786E-08	1.786E-08
EC8-EC10	5000	5000	5000	1	0.0002	0.0002	0.0002
EC10-EC12	5000	5000	5000	110	0.022	0.022	0.022
EC12-EC16	5100	5100	5100	240	0.0470588	0.0470588	0.0470588
EC16-EC21	3800	3800	3800	920	0.2421053	0.2421053	0.2421053
EC21-EC35	3800	3800	3800	2800	0.7368421	0.7368421	0.7368421
EC35-EC44	3800	3800	3800	65	0.0171053	0.0171053	0.0171053
				HI	**1.07**	**1.07**	**1.07**

$$HI = \sum_{Fi=1}^{16} HQ\ Fi = \frac{\text{Measured concentration Fi (mg/kg)}}{\text{S4UL Fi (mg/kg)}}$$

where: HI = Hazard Index
HQ = Hazard Quotient
Fi = Fraction I
S4UL = LQM Suitable 4 Use Levels (S4ULs)

Job Collyhurst Village, Manchester
Job No. LKC 20 1120
SOM 3%
Comment
WS13 D2 0.8-1.7m

Residential With Plant Uptake

	1% S4UL	2.50% S4UL	6% S4UL	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	42	78	160	1	0.0238095	0.0128205	0.00625
EC6-EC8	100	230	530	1	0.01	0.0043478	0.0018868
EC8-EC10	27	65	150	1	0.037037	0.0153846	0.0066667
EC10-EC12	130	330	760	1	0.0076923	0.0030303	0.0013158
EC12-EC16	1100	2400	4300	1	0.0009091	0.0004167	0.0002326
EC16-EC21	65000	92000	110000	88	0.0013538	0.0009565	0.0008
EC21-EC35							
EC35-EC44	65000	92000	110000	1	1.538E-05	1.087E-05	9.091E-06
Aromatic							
EC5-EC7 (benzene)	70	140	300	0.001	1.429E-05	7.143E-06	3.333E-06
EC7-EC8 (tolulene)	130	290	660	0.001	7.692E-06	3.448E-06	1.515E-06
EC8-EC10	34	83	190	1	0.0294118	0.0120482	0.0052632
EC10-EC12	74	180	380	1	0.0135135	0.0055556	0.0026316
EC12-EC16	140	330	660	1	0.0071429	0.0030303	0.0015152
EC16-EC21	260	540	930	1	0.0038462	0.0018519	0.0010753
EC21-EC35	1100	1500	1700	40	0.0363636	0.0266667	0.0235294
EC35-EC44	1100	1500	1700	1	0.0009091	0.0006667	0.0005882
				HI	**0.17**	**0.09**	**0.05**

Appendix I

HazWaste Output Sheets

Waste Classification Report

K2JDW-QN9G9-HL5YQ

Job name

LKC 20 1120

Description/Comments

Project

LKC 20 1120

Site

Collyhurst

Related Documents

#	Name	Description
1	HWOL_20-18141-20200728 170140.hwol	.hwol file used to create the Job
2	HWOL_20-18300-20200728 131927.hwol	.hwol file used to create the Job
3	HWOL_20-18317-20200728 131949.hwol	.hwol file used to create the Job
4	HWOL_20-18506-20200804 112752.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Colin Crompton
Date:
26 Aug 2020 10:02 GMT
Telephone:
0161 763 7200

Company:
LK Group
Unit 29, Eton Business Park
Eton Hill Rd, Radcliffe
Greater Manchester
M26 2ZS

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	-
Advanced Hazardous Waste Classification	-

Report

Created by: Colin Crompton
Created date: 26 Aug 2020 10:02 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	WS4/D1-1033720-15/07/2020-0.10	0.10-0.80	Non Hazardous		3
2	WS4/D2-1033721-15/07/2020-1.20	1.20-1.50	Non Hazardous		5
3	WS1/D1-1033722-15/07/2020-0.10	0.10-0.50	Non Hazardous		6
4	WS2/D2-1033725-15/07/2020-0.70	0.70-1.00	Non Hazardous		8
5	WS5/D1-1033728-15/07/2020-0.0	0.0-0..30	Hazardous	HP 8	11
6	WS3B/D1-1033731-15/07/2020-0.00	0.00-0.50	Non Hazardous		13
7	WS13/D1-1033734-15/07/2020-0.00	0.00-0.50	Non Hazardous		15

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
8	WS13/D2-1033735-15/07/2020-0.80	0.80-1.70	Non Hazardous		17
9	WS3/D1-1033737-15/07/2020-0.10	0.10-0.40	Non Hazardous		20
10	WS3/D2-1033738-15/07/2020-0.8	0.8-1.2	Non Hazardous		22
11	TP118/D1-1033739-15/07/2020-0.20	0.20-1.00	Non Hazardous		24
12	TP119/D2-1033742-15/07/2020-0.40	0.40-0.80	Hazardous	HP 7, HP 11	26
13	TP111/D1-1033745-15/07/2020-0.10	0.10-1.10	Non Hazardous		29
14	TP113/D1-1033747-15/07/2020-0.00	0.00-0.30	Non Hazardous		31
15	TP112/D2-1033751-15/07/2020-0.30	0.30-1.00	Non Hazardous		33
16	TP108/D1-1033755-15/07/2020-0.00	0.00-0.30	Non Hazardous		36
17	TP101/D1-1033759-15/07/2020-0.00	0.00-1.00	Non Hazardous		38
18	WS9/D1-14/07/2020-0.00	0.00-0.60	Non Hazardous		41
19	WS9/D2-14/07/2020-1.50	1.50-1.80	Non Hazardous		43
20	WS11D/D1-14/07/2020-0.00	0.00-0.40	Non Hazardous		44
21	WS12/D2-14/07/2020-0.30	0.30-1.00	Non Hazardous		46
22	WS6/D1-14/07/2020-0.00	0.00-0.30	Non Hazardous		49
23	WS6/D3-14/07/2020-0.80	0.80-1.00	Non Hazardous		51
24	WS7C/D1-14/07/2020-0.00	0.00-0.60	Non Hazardous		52
25	WS8/D2-14/07/2020-0.80	0.80-1.50	Non Hazardous		54
26	TP117/D2-14/07/2020-0.20	0.20-1.20	Hazardous	HP 7, HP 11	57
27	TP120/D1-14/07/2020-0.10	0.10-0.80	Non Hazardous		60
28	TP125/D2-14/07/2020-0.30	0.30-1.20	Non Hazardous		62
29	TP122/D2-14/07/2020-0.30	0.30-0.80	Non Hazardous		64
30	TP126/D1-14/07/2020-0.30	0.30-0.70	Non Hazardous		66
31	TP123/D2-14/07/2020-0.30	0.30-0.90	Non Hazardous		68
32	TP121/D1-14/07/2020-0.20	0.20-1.10	Non Hazardous		70
33	TP129/D1-14/07/2020-0.10	0.10-1.00	Non Hazardous		73
34	TP133/D1-14/07/2020-0.00	0.00-1.00	Non Hazardous		75
35	WS15 D1-1031984-13/07/2020-0.0	0.0-0.7	Non Hazardous		77
36	WS15 D2-1031985-13/07/2020-0.8	0.8-1.0	Non Hazardous		79
37	WS17 D1-1031986-13/07/2020-0.6	0.6-1.0	Non Hazardous		80
38	WS18 D2-1031991-13/07/2020-0.4	0.4-1.0	Non Hazardous		82
39	WS16 D2-1031995-13/07/2020-1.5	1.5-1.5	Non Hazardous		84
40	WS14B D1-1031998-13/07/2020-0.4	0.4-1.0	Non Hazardous		87
41	WS14B D2-1031999-13/07/2020-1.6	1.6-2.0	Hazardous	HP 7, HP 11	89
42	WS14B D3-1032000-13/07/2020-4.0	4.0-4.5	Hazardous	HP 7, HP 11	92
43	WS10 D1-1032001-13/07/2020-0.0	0.0-0.3	Non Hazardous		94

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	96
Appendix B: Rationale for selection of metal species	97
Appendix C: Version	98

Classification of sample: WS4/D1-1033720-15/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS4/D1-1033720-15/07/2020-0.10
Sample Depth:
0.10-0.80 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	16.451	mg/kg	0.00165 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.35	mg/kg	1.142	0.356	mg/kg	0.0000356 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24	mg/kg	1.462	31.219	mg/kg	0.00312 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		290	mg/kg	1.126	290.592	mg/kg	0.0291 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	88	mg/kg		78.32	mg/kg	0.00783 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.33	mg/kg	1.353	0.398	mg/kg	0.0000398 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		32	mg/kg	2.976	84.764	mg/kg	0.00848 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		98	mg/kg	2.774	241.961	mg/kg	0.0242 %	✓	
11		pH			PH		9.6	pH		9.6	pH	9.6 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				3.4	mg/kg		3.026	mg/kg	0.000303 %	✓	
			201-581-5	85-01-8									
17		anthracene				1	mg/kg		0.89	mg/kg	0.000089 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				4.9	mg/kg		4.361	mg/kg	0.000436 %	✓	
			205-912-4	206-44-0									
19		pyrene				4.1	mg/kg		3.649	mg/kg	0.000365 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				2.1	mg/kg		1.869	mg/kg	0.000187 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.9	mg/kg		1.691	mg/kg	0.000169 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				2.7	mg/kg		2.403	mg/kg	0.00024 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.77	mg/kg		0.685	mg/kg	0.0000685 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				2	mg/kg		1.78	mg/kg	0.000178 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				1.2	mg/kg		1.068	mg/kg	0.000107 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.1	mg/kg		0.979	mg/kg	0.0000979 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				18	mg/kg	1.785	28.599	mg/kg	0.00286 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0797 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS4/D2-1033721-15/07/2020-1.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS4/D2-1033721-15/07/2020-1.20
Sample Depth:
1.20-1.50 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.8 pH		8.8 pH	8.8 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS1/D1-1033722-15/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS1/D1-1033722-15/07/2020-0.10
Sample Depth:
0.10-0.50 m
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		16 mg/kg	1.32	18.168 mg/kg	0.00182 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	cadmium { cadmium oxide }		0.36 mg/kg	1.142	0.354 mg/kg	0.0000354 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		24 mg/kg	1.462	30.167 mg/kg	0.00302 %	✓	
	/ 215-160-9 / 1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
	024-001-00-0 / 215-607-8 / 1333-82-0							
5	copper { dicopper oxide; copper (I) oxide }		72 mg/kg	1.126	69.715 mg/kg	0.00697 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	120 mg/kg		103.2 mg/kg	0.0103 %	✓	
	082-001-00-6 / /							
7	mercury { mercury dichloride }		0.37 mg/kg	1.353	0.431 mg/kg	0.0000431 %	✓	
	080-010-00-X / 231-299-8 / 7487-94-7							
8	nickel { nickel chromate }		32 mg/kg	2.976	81.907 mg/kg	0.00819 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		0.26 mg/kg	2.554	0.571 mg/kg	0.0000571 %	✓	
	034-002-00-8 / /							
10	zinc { zinc chromate }		84 mg/kg	2.774	200.404 mg/kg	0.02 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
11	pH		8.7 pH		8.7 pH	8.7 pH		
	/ / PH							
12	naphthalene		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
	601-052-00-2 / 202-049-5 / 91-20-3							
13	acenaphthylene		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
	/ 205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				2.1	mg/kg		1.806	mg/kg	0.000181 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.5	mg/kg		0.43	mg/kg	0.000043 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				3.4	mg/kg		2.924	mg/kg	0.000292 %	✓	
			205-912-4	206-44-0									
19		pyrene				2.9	mg/kg		2.494	mg/kg	0.000249 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1.6	mg/kg		1.376	mg/kg	0.000138 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.3	mg/kg		1.118	mg/kg	0.000112 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				1.8	mg/kg		1.548	mg/kg	0.000155 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.71	mg/kg		0.611	mg/kg	0.0000611 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.8	mg/kg		1.548	mg/kg	0.000155 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.95	mg/kg		0.817	mg/kg	0.0000817 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.4	mg/kg		1.204	mg/kg	0.00012 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				23	mg/kg	1.785	35.311	mg/kg	0.00353 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0558 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS2/D2-1033725-15/07/2020-0.70

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS2/D2-1033725-15/07/2020-0.70
Sample Depth:
0.70-1.00 m
Moisture content:
19%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.111	mg/kg	0.00171 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1.3	mg/kg	3.22	3.391	mg/kg	0.000339 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.17	mg/kg	1.142	0.157	mg/kg	0.0000157 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	27.229	mg/kg	0.00272 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		130	mg/kg	1.126	118.556	mg/kg	0.0119 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1000	mg/kg		810	mg/kg	0.081 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.44	mg/kg	1.353	0.482	mg/kg	0.0000482 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		33	mg/kg	2.976	79.556	mg/kg	0.00796 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.46	mg/kg	2.554	0.951	mg/kg	0.0000951 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		91	mg/kg	2.774	204.482	mg/kg	0.0204 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
19		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
20		naphthalene				0.59	mg/kg		0.478	mg/kg	0.0000478 %	✓	
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				0.47	mg/kg		0.381	mg/kg	0.0000381 %	✓	
			205-917-1	208-96-8									
22		acenaphthene				0.65	mg/kg		0.527	mg/kg	0.0000527 %	✓	
			201-469-6	83-32-9									
23		fluorene				0.73	mg/kg		0.591	mg/kg	0.0000591 %	✓	
			201-695-5	86-73-7									
24		phenanthrene				5.1	mg/kg		4.131	mg/kg	0.000413 %	✓	
			201-581-5	85-01-8									
25		anthracene				1.2	mg/kg		0.972	mg/kg	0.0000972 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				8.3	mg/kg		6.723	mg/kg	0.000672 %	✓	
			205-912-4	206-44-0									
27		pyrene				8.5	mg/kg		6.885	mg/kg	0.000689 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				3.9	mg/kg		3.159	mg/kg	0.000316 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				4.1	mg/kg		3.321	mg/kg	0.000332 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				6.2	mg/kg		5.022	mg/kg	0.000502 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				2.1	mg/kg		1.701	mg/kg	0.00017 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				4.8	mg/kg		3.888	mg/kg	0.000389 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				3	mg/kg		2.43	mg/kg	0.000243 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.54	mg/kg		0.437	mg/kg	0.0000437 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				3.1	mg/kg		2.511	mg/kg	0.000251 %	✓	
			205-883-8	191-24-2									
36		vanadium { divanadium pentaoxide; vanadium pentoxide }				30	mg/kg	1.785	43.38	mg/kg	0.00434 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.136 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS5/D1-1033728-15/07/2020-0.0

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
WS5/D1-1033728-15/07/2020-0.0
Sample Depth:
0.0-0..30 m
Moisture content:
6.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.5 pH)

Determinands

Moisture content: 6.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	17.246	mg/kg	0.00172 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.3	mg/kg	1.142	2.451	mg/kg	0.000245 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23.31	mg/kg	1.462	31.786	mg/kg	0.00318 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		0.69	mg/kg	1.923	1.238	mg/kg	0.000124 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22	mg/kg	1.126	23.11	mg/kg	0.00231 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	58	mg/kg		54.114	mg/kg	0.00541 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.19	mg/kg	1.353	0.24	mg/kg	0.000024 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18	mg/kg	2.976	49.983	mg/kg	0.005 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		**<LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		47	mg/kg	2.774	121.649	mg/kg	0.0122 %	✓	
11	pH			PH		11.5	pH		11.5	pH	11.5 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12		naphthalene				2.7	mg/kg		2.519	mg/kg	0.000252 %	✓	
		601-052-00-2	202-049-5	91-20-3									
13	•	acenaphthylene				0.11	mg/kg		0.103	mg/kg	0.0000103 %	✓	
			205-917-1	208-96-8									
14	•	acenaphthene				4.7	mg/kg		4.385	mg/kg	0.000439 %	✓	
			201-469-6	83-32-9									
15	•	fluorene				3.2	mg/kg		2.986	mg/kg	0.000299 %	✓	
			201-695-5	86-73-7									
16	•	phenanthrene				18	mg/kg		16.794	mg/kg	0.00168 %	✓	
			201-581-5	85-01-8									
17	•	anthracene				4.5	mg/kg		4.198	mg/kg	0.00042 %	✓	
			204-371-1	120-12-7									
18	•	fluoranthene				19	mg/kg		17.727	mg/kg	0.00177 %	✓	
			205-912-4	206-44-0									
19	•	pyrene				16	mg/kg		14.928	mg/kg	0.00149 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				6.2	mg/kg		5.785	mg/kg	0.000578 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				7.4	mg/kg		6.904	mg/kg	0.00069 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				8.2	mg/kg		7.651	mg/kg	0.000765 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				2.6	mg/kg		2.426	mg/kg	0.000243 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				6.5	mg/kg		6.064	mg/kg	0.000606 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25	•	indeno[123-cd]pyrene				4	mg/kg		3.732	mg/kg	0.000373 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.72	mg/kg		0.672	mg/kg	0.0000672 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27	•	benzo[ghi]perylene				3.8	mg/kg		3.545	mg/kg	0.000355 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				12	mg/kg	1.785	19.987	mg/kg	0.002 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0423 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"

Force this Hazardous property to non hazardous because Oxidisability in soils containing Cr VI up to around 100mg/kg in soil is likely to be low. In soils it is suggested that flammability/oxidisability are unlikely to result in a hazardous classification for waste soil - AGS Guidance of Waste Classification.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00012%)

Classification of sample: WS3B/D1-1033731-15/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS3B/D1-1033731-15/07/2020-0.00
Sample Depth:
0.00-0.50 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	17.23	mg/kg	0.00172 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1	mg/kg	1.142	1.093	mg/kg	0.000109 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18	mg/kg	1.462	22.888	mg/kg	0.00229 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		45	mg/kg	1.126	44.079	mg/kg	0.00441 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	160	mg/kg		139.2	mg/kg	0.0139 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.32	mg/kg	1.353	0.377	mg/kg	0.0000377 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23	mg/kg	2.976	59.555	mg/kg	0.00596 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.43	mg/kg	2.554	0.955	mg/kg	0.0000955 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		98	mg/kg	2.774	236.524	mg/kg	0.0237 %	✓	
11	pH			PH		7.8	pH		7.8	pH	7.8 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				2.1	mg/kg		1.827	mg/kg	0.000183 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.51	mg/kg		0.444	mg/kg	0.0000444 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				3.1	mg/kg		2.697	mg/kg	0.00027 %	✓	
			205-912-4	206-44-0									
19		pyrene				2.5	mg/kg		2.175	mg/kg	0.000217 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1.4	mg/kg		1.218	mg/kg	0.000122 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.4	mg/kg		1.218	mg/kg	0.000122 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				1.9	mg/kg		1.653	mg/kg	0.000165 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.69	mg/kg		0.6	mg/kg	0.00006 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.5	mg/kg		1.305	mg/kg	0.000131 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.95	mg/kg		0.826	mg/kg	0.0000826 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.1	mg/kg		0.957	mg/kg	0.0000957 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				23	mg/kg	1.785	35.722	mg/kg	0.00357 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0574 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS13/D1-1033734-15/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS13/D1-1033734-15/07/2020-0.00
Sample Depth:
0.00-0.50 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		29	mg/kg	1.32	33.695	mg/kg	0.00337 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<**LOD**
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24	mg/kg	1.462	30.868	mg/kg	0.00309 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		78	mg/kg	1.126	77.281	mg/kg	0.00773 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1400	mg/kg		1232	mg/kg	0.123 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.95	mg/kg	1.353	1.132	mg/kg	0.000113 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		32	mg/kg	2.976	83.812	mg/kg	0.00838 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.45	mg/kg	2.554	1.011	mg/kg	0.000101 %	✓	
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		320	mg/kg	2.774	781.2	mg/kg	0.0781 %	✓	
11		pH			PH		8.6	pH		8.6	pH	8.6 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				2.8	mg/kg		2.464	mg/kg	0.000246 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.5	mg/kg		0.44	mg/kg	0.000044 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				4.7	mg/kg		4.136	mg/kg	0.000414 %	✓	
			205-912-4	206-44-0									
19		pyrene				4.1	mg/kg		3.608	mg/kg	0.000361 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1.9	mg/kg		1.672	mg/kg	0.000167 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				2.3	mg/kg		2.024	mg/kg	0.000202 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				2.9	mg/kg		2.552	mg/kg	0.000255 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.1	mg/kg		0.968	mg/kg	0.0000968 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				2.2	mg/kg		1.936	mg/kg	0.000194 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				1.4	mg/kg		1.232	mg/kg	0.000123 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.7	mg/kg		1.496	mg/kg	0.00015 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				26	mg/kg	1.785	40.845	mg/kg	0.00408 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.231 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS13/D2-1033735-15/07/2020-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS13/D2-1033735-15/07/2020-0.80
Sample Depth:
0.80-1.70 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	16.082 mg/kg	0.00161 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.7 mg/kg	3.22	1.961 mg/kg	0.000196 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.18 mg/kg	1.142	0.179 mg/kg	0.0000179 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	36.875 mg/kg	0.00369 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		38 mg/kg	1.126	37.222 mg/kg	0.00372 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	80 mg/kg		69.6 mg/kg	0.00696 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.32 mg/kg	1.353	0.377 mg/kg	0.0000377 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		42 mg/kg	2.976	108.753 mg/kg	0.0109 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.51 mg/kg	2.554	1.133 mg/kg	0.000113 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		73 mg/kg	2.774	176.186 mg/kg	0.0176 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		130 mg/kg		113.1 mg/kg	0.0113 %	✓	
13	confirm TPH has NOT arisen from diesel or petrol					☑					

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
20		pH				7.6	pH		7.6	pH	7.6 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
			201-581-5	85-01-8									
26		anthracene				0.29	mg/kg		0.252	mg/kg	0.0000252 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				1.7	mg/kg		1.479	mg/kg	0.000148 %	✓	
			205-912-4	206-44-0									
28		pyrene				2.4	mg/kg		2.088	mg/kg	0.000209 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				1.7	mg/kg		1.479	mg/kg	0.000148 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				1.6	mg/kg		1.392	mg/kg	0.000139 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				2.9	mg/kg		2.523	mg/kg	0.000252 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				3.3	mg/kg		2.871	mg/kg	0.000287 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				2	mg/kg		1.74	mg/kg	0.000174 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				2.3	mg/kg		2.001	mg/kg	0.0002 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				31	mg/kg	1.785	48.146	mg/kg	0.00481 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.063 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0113%)

Classification of sample: WS3/D1-1033737-15/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS3/D1-1033737-15/07/2020-0.10
Sample Depth:
0.10-0.40 m
Moisture content:
9.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		33 mg/kg	1.32	39.344 mg/kg	0.00393 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24 mg/kg	1.462	31.675 mg/kg	0.00317 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		84 mg/kg	1.126	85.401 mg/kg	0.00854 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	520 mg/kg		469.56 mg/kg	0.047 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.48 mg/kg	1.353	0.587 mg/kg	0.0000587 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		29 mg/kg	2.976	77.939 mg/kg	0.00779 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.34 mg/kg	2.554	0.784 mg/kg	0.0000784 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120 mg/kg	2.774	300.607 mg/kg	0.0301 %	✓	
11	pH			PH		8.3 pH		8.3 pH	8.3 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.46 mg/kg		0.415 mg/kg	0.0000415 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.24 mg/kg		0.217 mg/kg	0.0000217 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				2.5	mg/kg		2.258	mg/kg	0.000226 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.4	mg/kg		1.264	mg/kg	0.000126 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				13	mg/kg		11.739	mg/kg	0.00117 %	✓	
			201-581-5	85-01-8									
17		anthracene				3.1	mg/kg		2.799	mg/kg	0.00028 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				20	mg/kg		18.06	mg/kg	0.00181 %	✓	
			205-912-4	206-44-0									
19		pyrene				18	mg/kg		16.254	mg/kg	0.00163 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				8.3	mg/kg		7.495	mg/kg	0.000749 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				8.6	mg/kg		7.766	mg/kg	0.000777 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				10	mg/kg		9.03	mg/kg	0.000903 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				4.1	mg/kg		3.702	mg/kg	0.00037 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				9	mg/kg		8.127	mg/kg	0.000813 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				5.1	mg/kg		4.605	mg/kg	0.000461 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				1.2	mg/kg		1.084	mg/kg	0.000108 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				5	mg/kg		4.515	mg/kg	0.000451 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				27	mg/kg	1.785	43.525	mg/kg	0.00435 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
29		asbestos				<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.116 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3/D2-1033738-15/07/2020-0.8

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS3/D2-1033738-15/07/2020-0.8
Sample Depth:
0.8-1.2 m
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	13.309	mg/kg	0.00133 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.8	mg/kg	1.142	3.646	mg/kg	0.000365 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		53	mg/kg	1.462	65.068	mg/kg	0.00651 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		130	mg/kg	1.126	122.947	mg/kg	0.0123 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	210	mg/kg		176.4	mg/kg	0.0176 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.3	mg/kg	1.353	1.478	mg/kg	0.000148 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28	mg/kg	2.976	70.002	mg/kg	0.007 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.58	mg/kg	2.554	1.244	mg/kg	0.000124 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		350	mg/kg	2.774	815.599	mg/kg	0.0816 %	✓	
11	pH			PH		8	pH		8	pH	8pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.4	mg/kg		0.336	mg/kg	0.0000336 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.11	mg/kg		0.0924	mg/kg	0.00000924 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				1.6	mg/kg		1.344	mg/kg	0.000134 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.2	mg/kg		1.008	mg/kg	0.000101 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				8.4	mg/kg		7.056	mg/kg	0.000706 %	✓	
			201-581-5	85-01-8									
17		anthracene				1.9	mg/kg		1.596	mg/kg	0.00016 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				16	mg/kg		13.44	mg/kg	0.00134 %	✓	
			205-912-4	206-44-0									
19		pyrene				15	mg/kg		12.6	mg/kg	0.00126 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				8.4	mg/kg		7.056	mg/kg	0.000706 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				7.8	mg/kg		6.552	mg/kg	0.000655 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				11	mg/kg		9.24	mg/kg	0.000924 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				4.4	mg/kg		3.696	mg/kg	0.00037 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				10	mg/kg		8.4	mg/kg	0.00084 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				6.5	mg/kg		5.46	mg/kg	0.000546 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				1.4	mg/kg		1.176	mg/kg	0.000118 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				6.1	mg/kg		5.124	mg/kg	0.000512 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				20	mg/kg	1.785	29.991	mg/kg	0.003 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.138 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP118/D1-1033739-15/07/2020-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP118/D1-1033739-15/07/2020-0.20
Sample Depth:
0.20-1.00 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	27.027	mg/kg	0.0027 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.3	mg/kg	1.142	2.338	mg/kg	0.000234 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	35.121	mg/kg	0.00351 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		210	mg/kg	1.126	210.429	mg/kg	0.021 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	480	mg/kg		427.2	mg/kg	0.0427 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.83	mg/kg	1.353	1.0	mg/kg	0.0001 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		31	mg/kg	2.976	82.115	mg/kg	0.00821 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.25	mg/kg	2.554	0.568	mg/kg	0.0000568 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		160	mg/kg	2.774	395.038	mg/kg	0.0395 %	✓	
11	pH			PH		8.5	pH		8.5	pH	8.5 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
16		phenanthrene				0.88	mg/kg		0.783	mg/kg	0.0000783 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.28	mg/kg		0.249	mg/kg	0.0000249 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				1.1	mg/kg		0.979	mg/kg	0.0000979 %	✓	
			205-912-4	206-44-0									
19		pyrene				1.2	mg/kg		1.068	mg/kg	0.000107 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				29	mg/kg	1.785	46.076	mg/kg	0.00461 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.123 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP119/D2-1033742-15/07/2020-0.40

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
TP119/D2-1033742-15/07/2020-0.40
Sample Depth:
0.40-0.80 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.223%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.223%)

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		31 mg/kg	1.32	36.428 mg/kg	0.00364 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.61 mg/kg	3.22	1.748 mg/kg	0.000175 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.7 mg/kg	1.142	1.728 mg/kg	0.000173 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	26.016 mg/kg	0.0026 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		480 mg/kg	1.126	480.979 mg/kg	0.0481 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	360	mg/kg		320.4	mg/kg	0.032 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.72	mg/kg	1.353	0.867	mg/kg	0.0000867 %	✓	
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		47	mg/kg	2.976	124.497	mg/kg	0.0124 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.2	mg/kg	2.554	2.727	mg/kg	0.000273 %	✓	
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120	mg/kg	2.774	296.279	mg/kg	0.0296 %	✓	
12		TPH (C6 to C40) petroleum group			TPH		2500	mg/kg		2225	mg/kg	0.223 %	✓	
13		confirm TPH has NOT arisen from diesel or petrol					☑							
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				7.8	mg/kg	1.884	13.079	mg/kg	0.00131 %	✓	
20		pH			PH		8	pH		8	pH	8pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		15	mg/kg		13.35	mg/kg	0.00134 %	✓	
22		acenaphthylene		205-917-1	208-96-8		6.8	mg/kg		6.052	mg/kg	0.000605 %	✓	
23		acenaphthene		201-469-6	83-32-9		33	mg/kg		29.37	mg/kg	0.00294 %	✓	
24		fluorene		201-695-5	86-73-7		27	mg/kg		24.03	mg/kg	0.0024 %	✓	
25		phenanthrene		201-581-5	85-01-8		210	mg/kg		186.9	mg/kg	0.0187 %	✓	
26		anthracene		204-371-1	120-12-7		60	mg/kg		53.4	mg/kg	0.00534 %	✓	
27		fluoranthene		205-912-4	206-44-0		250	mg/kg		222.5	mg/kg	0.0222 %	✓	
28		pyrene		204-927-3	129-00-0		250	mg/kg		222.5	mg/kg	0.0222 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		160	mg/kg		142.4	mg/kg	0.0142 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		170	mg/kg		151.3	mg/kg	0.0151 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		270	mg/kg		240.3	mg/kg	0.024 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
32		benzo[k]fluoranthene				120	mg/kg		106.8	mg/kg	0.0107 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				370	mg/kg		329.3	mg/kg	0.0329 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				270	mg/kg		240.3	mg/kg	0.024 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				56	mg/kg		49.84	mg/kg	0.00498 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				310	mg/kg		275.9	mg/kg	0.0276 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				24	mg/kg	1.785	38.132	mg/kg	0.00381 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.586 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.223%)

Classification of sample: TP111/D1-1033745-15/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP111/D1-1033745-15/07/2020-0.10
Sample Depth:
0.10-1.10 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		37	mg/kg	1.32	42.501	mg/kg	0.00425 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.33	mg/kg	1.142	0.328	mg/kg	0.0000328 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	29.246	mg/kg	0.00292 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		76	mg/kg	1.126	74.444	mg/kg	0.00744 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	300	mg/kg		261	mg/kg	0.0261 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.27	mg/kg	1.353	0.318	mg/kg	0.0000318 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		52	mg/kg	2.976	134.646	mg/kg	0.0135 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.65	mg/kg	2.554	1.444	mg/kg	0.000144 %	✓	
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		75	mg/kg	2.774	181.013	mg/kg	0.0181 %	✓	
11		pH			PH		8.2	pH		8.2	pH	8.2 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		22	mg/kg		19.14	mg/kg	0.00191 %	✓	
13		acenaphthylene		205-917-1	208-96-8		0.49	mg/kg		0.426	mg/kg	0.0000426 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				18	mg/kg		15.66	mg/kg	0.00157 %	✓	
			201-469-6	83-32-9									
15		fluorene				13	mg/kg		11.31	mg/kg	0.00113 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				78	mg/kg		67.86	mg/kg	0.00679 %	✓	
			201-581-5	85-01-8									
17		anthracene				17	mg/kg		14.79	mg/kg	0.00148 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				54	mg/kg		46.98	mg/kg	0.0047 %	✓	
			205-912-4	206-44-0									
19		pyrene				56	mg/kg		48.72	mg/kg	0.00487 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				24	mg/kg		20.88	mg/kg	0.00209 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				25	mg/kg		21.75	mg/kg	0.00217 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				27	mg/kg		23.49	mg/kg	0.00235 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				8.6	mg/kg		7.482	mg/kg	0.000748 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				23	mg/kg		20.01	mg/kg	0.002 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				11	mg/kg		9.57	mg/kg	0.000957 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				2.9	mg/kg		2.523	mg/kg	0.000252 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				11	mg/kg		9.57	mg/kg	0.000957 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				32	mg/kg	1.785	49.7	mg/kg	0.00497 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.112 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP113/D1-1033747-15/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP113/D1-1033747-15/07/2020-0.00
Sample Depth:
0.00-0.30 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	23.238	mg/kg	0.00232 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.56	mg/kg	1.142	0.563	mg/kg	0.0000563 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	33.44	mg/kg	0.00334 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		63	mg/kg	1.126	62.419	mg/kg	0.00624 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	240	mg/kg		211.2	mg/kg	0.0211 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1	mg/kg	1.353	1.191	mg/kg	0.000119 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		26	mg/kg	2.976	68.097	mg/kg	0.00681 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		**<LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		130	mg/kg	2.774	317.362	mg/kg	0.0317 %	✓	
11		pH			PH		8.2	pH		8.2	pH	8.2 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		1.2	mg/kg		1.056	mg/kg	0.000106 %	✓	
13		acenaphthylene		205-917-1	208-96-8		0.19	mg/kg		0.167	mg/kg	0.0000167 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				1.1	mg/kg		0.968	mg/kg	0.0000968 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.76	mg/kg		0.669	mg/kg	0.0000669 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				6.6	mg/kg		5.808	mg/kg	0.000581 %	✓	
			201-581-5	85-01-8									
17		anthracene				2.2	mg/kg		1.936	mg/kg	0.000194 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				13	mg/kg		11.44	mg/kg	0.00114 %	✓	
			205-912-4	206-44-0									
19		pyrene				12	mg/kg		10.56	mg/kg	0.00106 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				5.7	mg/kg		5.016	mg/kg	0.000502 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				5.2	mg/kg		4.576	mg/kg	0.000458 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				7.3	mg/kg		6.424	mg/kg	0.000642 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				2.3	mg/kg		2.024	mg/kg	0.000202 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				6.4	mg/kg		5.632	mg/kg	0.000563 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				3.5	mg/kg		3.08	mg/kg	0.000308 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.78	mg/kg		0.686	mg/kg	0.0000686 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				3.6	mg/kg		3.168	mg/kg	0.000317 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				24	mg/kg	1.785	37.703	mg/kg	0.00377 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.082 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP112/D2-1033751-15/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP112/D2-1033751-15/07/2020-0.30
Sample Depth:
0.30-1.00 m
Moisture content:
9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	13.216 mg/kg	0.00132 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.72 mg/kg	3.22	2.11 mg/kg	0.000211 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.19 mg/kg	1.142	0.198 mg/kg	0.0000198 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		12 mg/kg	1.462	15.96 mg/kg	0.0016 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22 mg/kg	1.126	22.54 mg/kg	0.00225 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	42 mg/kg		38.22 mg/kg	0.00382 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		13 mg/kg	2.976	35.209 mg/kg	0.00352 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		41 mg/kg	2.774	103.503 mg/kg	0.0104 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		220 mg/kg		200.2 mg/kg	0.02 %	✓	
13	confirm TPH has NOT arisen from diesel or petrol					☑					

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
20		pH			PH		10.9	pH		10.9	pH	10.9 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		2	mg/kg		1.82	mg/kg	0.000182 %	✓	
26		anthracene		204-371-1	120-12-7		0.65	mg/kg		0.592	mg/kg	0.0000592 %	✓	
27		fluoranthene		205-912-4	206-44-0		2.8	mg/kg		2.548	mg/kg	0.000255 %	✓	
28		pyrene		204-927-3	129-00-0		2.6	mg/kg		2.366	mg/kg	0.000237 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		1.092	mg/kg	0.000109 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		1.2	mg/kg		1.092	mg/kg	0.000109 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.9	mg/kg		1.729	mg/kg	0.000173 %	✓	
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.97	mg/kg		0.883	mg/kg	0.0000883 %	✓	
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.8	mg/kg		1.638	mg/kg	0.000164 %	✓	
34		indeno[123-cd]pyrene		205-893-2	193-39-5		1.1	mg/kg		1.001	mg/kg	0.0001 %	✓	
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
36		benzo[ghi]perylene		205-883-8	191-24-2		1.3	mg/kg		1.183	mg/kg	0.000118 %	✓	
37		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		13	mg/kg	1.785	21.119	mg/kg	0.00211 %	✓	
											Total:	0.0471 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.02%)

Classification of sample: TP108/D1-1033755-15/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP108/D1-1033755-15/07/2020-0.00
Sample Depth:
0.00-0.30 m
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.956	mg/kg	0.0018 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.56	mg/kg	1.142	0.544	mg/kg	0.0000544 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	27.331	mg/kg	0.00273 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		58	mg/kg	1.126	55.506	mg/kg	0.00555 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	170	mg/kg		144.5	mg/kg	0.0145 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.51	mg/kg	1.353	0.587	mg/kg	0.0000587 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		22	mg/kg	2.976	55.656	mg/kg	0.00557 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.3	mg/kg	2.554	0.651	mg/kg	0.0000651 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110	mg/kg	2.774	259.383	mg/kg	0.0259 %	✓	
11	pH			PH		8.4	pH		8.4	pH	8.4 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.75	mg/kg		0.638	mg/kg	0.0000637 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.21	mg/kg		0.179	mg/kg	0.0000179 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				2.5	mg/kg		2.125	mg/kg	0.000213 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.7	mg/kg		1.445	mg/kg	0.000145 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				13	mg/kg		11.05	mg/kg	0.00111 %	✓	
			201-581-5	85-01-8									
17		anthracene				3.1	mg/kg		2.635	mg/kg	0.000263 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				19	mg/kg		16.15	mg/kg	0.00161 %	✓	
			205-912-4	206-44-0									
19		pyrene				17	mg/kg		14.45	mg/kg	0.00145 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				8	mg/kg		6.8	mg/kg	0.00068 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				8.4	mg/kg		7.14	mg/kg	0.000714 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				11	mg/kg		9.35	mg/kg	0.000935 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				4.1	mg/kg		3.485	mg/kg	0.000349 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				9	mg/kg		7.65	mg/kg	0.000765 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				5.1	mg/kg		4.335	mg/kg	0.000433 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.93	mg/kg		0.791	mg/kg	0.0000791 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				5.6	mg/kg		4.76	mg/kg	0.000476 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				19	mg/kg	1.785	28.831	mg/kg	0.00288 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0685 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101/D1-1033759-15/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP101/D1-1033759-15/07/2020-0.00
Sample Depth:
0.00-1.00 m
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		62	mg/kg	1.32	73.674	mg/kg	0.00737 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.76	mg/kg	3.22	2.202	mg/kg	0.00022 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.98	mg/kg	1.142	1.008	mg/kg	0.000101 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		38	mg/kg	1.462	49.985	mg/kg	0.005 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		260	mg/kg	1.126	263.458	mg/kg	0.0263 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	490	mg/kg		441	mg/kg	0.0441 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		2.1	mg/kg	1.353	2.558	mg/kg	0.000256 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		51	mg/kg	2.976	136.611	mg/kg	0.0137 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.87	mg/kg	2.554	1.999	mg/kg	0.0002 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190	mg/kg	2.774	474.379	mg/kg	0.0474 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		110	mg/kg		99	mg/kg	0.0099 %	✓	
13	confirm TPH has NOT arisen from diesel or petrol					☑							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				1.1	mg/kg	1.884	1.865	mg/kg	0.000187 %	✓	
		006-007-00-5											
20		pH				8.3	pH		8.3	pH	8.3 pH		
				PH									
21		naphthalene				0.56	mg/kg		0.504	mg/kg	0.0000504 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.18	mg/kg		0.162	mg/kg	0.0000162 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				0.72	mg/kg		0.648	mg/kg	0.0000648 %	✓	
			201-469-6	83-32-9									
24		fluorene				0.55	mg/kg		0.495	mg/kg	0.0000495 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				5.7	mg/kg		5.13	mg/kg	0.000513 %	✓	
			201-581-5	85-01-8									
26		anthracene				1.2	mg/kg		1.08	mg/kg	0.000108 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				5.8	mg/kg		5.22	mg/kg	0.000522 %	✓	
			205-912-4	206-44-0									
28		pyrene				6.4	mg/kg		5.76	mg/kg	0.000576 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				3.1	mg/kg		2.79	mg/kg	0.000279 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				3.6	mg/kg		3.24	mg/kg	0.000324 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				5.1	mg/kg		4.59	mg/kg	0.000459 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				1.6	mg/kg		1.44	mg/kg	0.000144 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				5.4	mg/kg		4.86	mg/kg	0.000486 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				4.1	mg/kg		3.69	mg/kg	0.000369 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.73	mg/kg		0.657	mg/kg	0.0000657 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				4.1	mg/kg		3.69	mg/kg	0.000369 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				86	mg/kg	1.785	138.173	mg/kg	0.0138 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.173 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0099%)

Classification of sample: WS9/D1-14/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS9/D1-14/07/2020-0.00
Sample Depth:
0.00-0.60 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		99	mg/kg	1.32	107.184	mg/kg	0.0107 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.25	mg/kg	1.142	0.234	mg/kg	0.0000234 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	35.954	mg/kg	0.0036 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		230	mg/kg	1.126	212.343	mg/kg	0.0212 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	710	mg/kg		582.2	mg/kg	0.0582 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3	mg/kg	1.353	3.33	mg/kg	0.000333 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		86	mg/kg	2.976	209.886	mg/kg	0.021 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.1	mg/kg	2.554	2.303	mg/kg	0.00023 %	✓	
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190	mg/kg	2.774	432.212	mg/kg	0.0432 %	✓	
11		pH			PH		8.2	pH		8.2	pH	8.2 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				0.93	mg/kg		0.763	mg/kg	0.0000763 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.23	mg/kg		0.189	mg/kg	0.0000189 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				1.4	mg/kg		1.148	mg/kg	0.000115 %	✓	
			205-912-4	206-44-0									
19		pyrene				1.3	mg/kg		1.066	mg/kg	0.000107 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1	mg/kg		0.82	mg/kg	0.000082 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				0.89	mg/kg		0.73	mg/kg	0.000073 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				1.3	mg/kg		1.066	mg/kg	0.000107 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.45	mg/kg		0.369	mg/kg	0.0000369 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.2	mg/kg		0.984	mg/kg	0.0000984 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				1.1	mg/kg		0.902	mg/kg	0.0000902 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.89	mg/kg		0.73	mg/kg	0.000073 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				71	mg/kg	1.785	103.933	mg/kg	0.0104 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.17 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS9/D2-14/07/2020-1.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS9/D2-14/07/2020-1.50
Sample Depth:
1.50-1.80 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.2 pH		8.2 pH	8.2 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS11D/D1-14/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS11D/D1-14/07/2020-0.00
Sample Depth:
0.00-0.40 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22	mg/kg	1.32	25.852	mg/kg	0.00259 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		11	mg/kg	1.142	11.183	mg/kg	0.00112 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		56	mg/kg	1.462	72.844	mg/kg	0.00728 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		150	mg/kg	1.126	150.306	mg/kg	0.015 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	270	mg/kg		240.3	mg/kg	0.024 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		5.1	mg/kg	1.353	6.143	mg/kg	0.000614 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		37	mg/kg	2.976	98.008	mg/kg	0.0098 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.36	mg/kg	2.554	0.818	mg/kg	0.0000818 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190	mg/kg	2.774	469.108	mg/kg	0.0469 %	✓	
11	pH			PH		8.2	pH		8.2	pH	8.2 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.37	mg/kg		0.329	mg/kg	0.0000329 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.13	mg/kg		0.116	mg/kg	0.0000116 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.27	mg/kg		0.24	mg/kg	0.000024 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.24	mg/kg		0.214	mg/kg	0.0000214 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				2.6	mg/kg		2.314	mg/kg	0.000231 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.64	mg/kg		0.57	mg/kg	0.000057 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				4.3	mg/kg		3.827	mg/kg	0.000383 %	✓	
			205-912-4	206-44-0									
19		pyrene				4	mg/kg		3.56	mg/kg	0.000356 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				2.2	mg/kg		1.958	mg/kg	0.000196 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				2	mg/kg		1.78	mg/kg	0.000178 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				3	mg/kg		2.67	mg/kg	0.000267 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.98	mg/kg		0.872	mg/kg	0.0000872 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				2.7	mg/kg		2.403	mg/kg	0.00024 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				1.8	mg/kg		1.602	mg/kg	0.00016 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.39	mg/kg		0.347	mg/kg	0.0000347 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.5	mg/kg		1.335	mg/kg	0.000133 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				35	mg/kg	1.785	55.609	mg/kg	0.00556 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.116 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS12/D2-14/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS12/D2-14/07/2020-0.30
Sample Depth:
0.30-1.00 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	16.266 mg/kg	0.00163 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.89 mg/kg	1.142	0.895 mg/kg	0.0000895 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	18.006 mg/kg	0.0018 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		35 mg/kg	1.126	34.677 mg/kg	0.00347 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	56 mg/kg		49.28 mg/kg	0.00493 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.46 mg/kg	1.353	0.548 mg/kg	0.0000548 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15 mg/kg	2.976	39.287 mg/kg	0.00393 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		44 mg/kg	2.774	107.415 mg/kg	0.0107 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.6	pH		8.6	pH	8.6 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				0.46	mg/kg		0.405	mg/kg	0.0000405 %	✓	
			201-581-5	85-01-8									
25		anthracene				0.12	mg/kg		0.106	mg/kg	0.0000106 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				0.6	mg/kg		0.528	mg/kg	0.0000528 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.53	mg/kg		0.466	mg/kg	0.0000466 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.28	mg/kg		0.246	mg/kg	0.0000246 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.25	mg/kg		0.22	mg/kg	0.000022 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.4	mg/kg		0.352	mg/kg	0.0000352 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.11	mg/kg		0.0968	mg/kg	0.00000968 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.33	mg/kg		0.29	mg/kg	0.000029 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		vanadium { divanadium pentaoxide; vanadium pentoxide }				17	mg/kg	1.785	26.706	mg/kg	0.00267 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.031 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS6/D1-14/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS6/D1-14/07/2020-0.00
Sample Depth:
0.00-0.30 m
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		29	mg/kg	1.32	34.46	mg/kg	0.00345 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.72	mg/kg	1.142	0.74	mg/kg	0.000074 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21	mg/kg	1.462	27.623	mg/kg	0.00276 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		77	mg/kg	1.126	78.024	mg/kg	0.0078 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	200	mg/kg		180	mg/kg	0.018 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.47	mg/kg	1.353	0.573	mg/kg	0.0000573 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		29	mg/kg	2.976	77.681	mg/kg	0.00777 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		130	mg/kg	2.774	324.575	mg/kg	0.0325 %	✓	
11		pH			PH		8.7	pH		8.7	pH	8.7 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		0.55	mg/kg		0.495	mg/kg	0.0000495 %	✓	
13		acenaphthylene		205-917-1	208-96-8		0.22	mg/kg		0.198	mg/kg	0.0000198 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.81	mg/kg		0.729	mg/kg	0.0000729 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.94	mg/kg		0.846	mg/kg	0.0000846 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				12	mg/kg		10.8	mg/kg	0.00108 %	✓	
			201-581-5	85-01-8									
17		anthracene				2.9	mg/kg		2.61	mg/kg	0.000261 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				21	mg/kg		18.9	mg/kg	0.00189 %	✓	
			205-912-4	206-44-0									
19		pyrene				18	mg/kg		16.2	mg/kg	0.00162 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				10	mg/kg		9	mg/kg	0.0009 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				8.4	mg/kg		7.56	mg/kg	0.000756 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				13	mg/kg		11.7	mg/kg	0.00117 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				4.6	mg/kg		4.14	mg/kg	0.000414 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				11	mg/kg		9.9	mg/kg	0.00099 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				8.3	mg/kg		7.47	mg/kg	0.000747 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				1.3	mg/kg		1.17	mg/kg	0.000117 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				6.3	mg/kg		5.67	mg/kg	0.000567 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				30	mg/kg	1.785	48.2	mg/kg	0.00482 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0881 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS6/D3-14/07/2020-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS6/D3-14/07/2020-0.80
Sample Depth:
0.80-1.00 m
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.5 pH		8.5 pH	8.5 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS7C/D1-14/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS7C/D1-14/07/2020-0.00
Sample Depth:
0.00-0.60 m
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		29	mg/kg	1.32	34.46	mg/kg	0.00345 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.7	mg/kg	1.142	1.748	mg/kg	0.000175 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	39.462	mg/kg	0.00395 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		120	mg/kg	1.126	121.596	mg/kg	0.0122 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	350	mg/kg		315	mg/kg	0.0315 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.65	mg/kg	1.353	0.792	mg/kg	0.0000792 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		38	mg/kg	2.976	101.788	mg/kg	0.0102 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		270	mg/kg	2.774	674.118	mg/kg	0.0674 %	✓	
11	pH			PH		8.5	pH		8.5	pH	8.5 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
16		phenanthrene				3.8	mg/kg		3.42	mg/kg	0.000342 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.96	mg/kg		0.864	mg/kg	0.0000864 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				6.1	mg/kg		5.49	mg/kg	0.000549 %	✓	
			205-912-4	206-44-0									
19		pyrene				5.4	mg/kg		4.86	mg/kg	0.000486 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				3.1	mg/kg		2.79	mg/kg	0.000279 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				2.7	mg/kg		2.43	mg/kg	0.000243 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				4.1	mg/kg		3.69	mg/kg	0.000369 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.4	mg/kg		1.26	mg/kg	0.000126 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				3.7	mg/kg		3.33	mg/kg	0.000333 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				2.6	mg/kg		2.34	mg/kg	0.000234 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.42	mg/kg		0.378	mg/kg	0.0000378 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.9	mg/kg		1.71	mg/kg	0.000171 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				31	mg/kg	1.785	49.807	mg/kg	0.00498 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.137 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS8/D2-14/07/2020-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS8/D2-14/07/2020-0.80
Sample Depth:
0.80-1.50 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	22.974	mg/kg	0.0023 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.43	mg/kg	3.22	1.205	mg/kg	0.00012 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.39	mg/kg	1.142	0.388	mg/kg	0.0000388 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21	mg/kg	1.462	26.703	mg/kg	0.00267 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		51	mg/kg	1.126	49.956	mg/kg	0.005 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	110	mg/kg		95.7	mg/kg	0.00957 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.2	mg/kg	1.353	0.236	mg/kg	0.0000236 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35	mg/kg	2.976	90.627	mg/kg	0.00906 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.21	mg/kg	2.554	0.467	mg/kg	0.0000467 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		88	mg/kg	2.774	212.389	mg/kg	0.0212 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		64	mg/kg		55.68	mg/kg	0.00557 %	✓	
13	confirm TPH has NOT arisen from diesel or petrol					☑							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
20		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				2.4	mg/kg		2.088	mg/kg	0.000209 %	✓	
			201-581-5	85-01-8									
26		anthracene				0.68	mg/kg		0.592	mg/kg	0.0000592 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				4.7	mg/kg		4.089	mg/kg	0.000409 %	✓	
			205-912-4	206-44-0									
28		pyrene				4.3	mg/kg		3.741	mg/kg	0.000374 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				2.5	mg/kg		2.175	mg/kg	0.000217 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				2.1	mg/kg		1.827	mg/kg	0.000183 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				3.4	mg/kg		2.958	mg/kg	0.000296 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				1	mg/kg		0.87	mg/kg	0.000087 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				3.1	mg/kg		2.697	mg/kg	0.00027 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				2.4	mg/kg		2.088	mg/kg	0.000209 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.42	mg/kg		0.365	mg/kg	0.0000365 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				2.1	mg/kg		1.827	mg/kg	0.000183 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				26	mg/kg	1.785	40.381	mg/kg	0.00404 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0624 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00557%)

Classification of sample: TP117/D2-14/07/2020-0.20

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
TP117/D2-14/07/2020-0.20
Sample Depth:
0.20-1.20 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.353%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.353%)

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		50 mg/kg	1.32	54.133 mg/kg	0.00541 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.97 mg/kg	3.22	2.561 mg/kg	0.000256 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.2 mg/kg	1.142	1.124 mg/kg	0.000112 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	23.97 mg/kg	0.0024 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		**<LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		220 mg/kg	1.126	203.11 mg/kg	0.0203 %	✓	

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	490 mg/kg		401.8 mg/kg	0.0402 %	✓	
		082-001-00-6							
8		mercury { mercury dichloride }		1.3 mg/kg	1.353	1.443 mg/kg	0.000144 %	✓	
		080-010-00-X / 231-299-8 / 7487-94-7							
9		nickel { nickel chromate }		57 mg/kg	2.976	139.111 mg/kg	0.0139 %	✓	
		028-035-00-7 / 238-766-5 / 14721-18-7							
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		1.1 mg/kg	2.554	2.303 mg/kg	0.00023 %	✓	
		034-002-00-8							
11		zinc { zinc chromate }		200 mg/kg	2.774	454.96 mg/kg	0.0455 %	✓	
		024-007-00-3 / 236-878-9 / 13530-65-9							
12		TPH (C6 to C40) petroleum group		4300 mg/kg		3526 mg/kg	0.353 %	✓	
		TPH							
13		confirm TPH has NOT arisen from diesel or petrol		☑					
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		603-181-00-X / 216-653-1 / 1634-04-4							
15		benzene		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8 / 200-753-7 / 71-43-2							
16		toluene		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3 / 203-625-9 / 108-88-3							
17		ethylbenzene		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4 / 202-849-4 / 100-41-4							
18		xylene		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		601-022-00-9 / 202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4] / 95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }		2.3 mg/kg	1.884	3.553 mg/kg	0.000355 %	✓	
		006-007-00-5							
20		pH		9 pH		9 pH	9pH		
		PH							
21		naphthalene		19 mg/kg		15.58 mg/kg	0.00156 %	✓	
		601-052-00-2 / 202-049-5 / 91-20-3							
22		acenaphthylene		3.1 mg/kg		2.542 mg/kg	0.000254 %	✓	
		205-917-1 / 208-96-8							
23		acenaphthene		7.5 mg/kg		6.15 mg/kg	0.000615 %	✓	
		201-469-6 / 83-32-9							
24		fluorene		8.1 mg/kg		6.642 mg/kg	0.000664 %	✓	
		201-695-5 / 86-73-7							
25		phenanthrene		68 mg/kg		55.76 mg/kg	0.00558 %	✓	
		201-581-5 / 85-01-8							
26		anthracene		15 mg/kg		12.3 mg/kg	0.00123 %	✓	
		204-371-1 / 120-12-7							
27		fluoranthene		69 mg/kg		56.58 mg/kg	0.00566 %	✓	
		205-912-4 / 206-44-0							
28		pyrene		68 mg/kg		55.76 mg/kg	0.00558 %	✓	
		204-927-3 / 129-00-0							
29		benzo[a]anthracene		39 mg/kg		31.98 mg/kg	0.0032 %	✓	
		601-033-00-9 / 200-280-6 / 56-55-3							
30		chrysene		34 mg/kg		27.88 mg/kg	0.00279 %	✓	
		601-048-00-0 / 205-923-4 / 218-01-9							
31		benzo[b]fluoranthene		42 mg/kg		34.44 mg/kg	0.00344 %	✓	
		601-034-00-4 / 205-911-9 / 205-99-2							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
32		benzo[k]fluoranthene				16	mg/kg		13.12	mg/kg	0.00131 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				43	mg/kg		35.26	mg/kg	0.00353 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				29	mg/kg		23.78	mg/kg	0.00238 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				6.1	mg/kg		5.002	mg/kg	0.0005 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				23	mg/kg		18.86	mg/kg	0.00189 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				35	mg/kg	1.785	51.235	mg/kg	0.00512 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.527 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.353%)

Classification of sample: TP120/D1-14/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP120/D1-14/07/2020-0.10
Sample Depth:
0.10-0.80 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22	mg/kg	1.32	25.561	mg/kg	0.00256 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.58	mg/kg	1.142	0.583	mg/kg	0.0000583 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		28	mg/kg	1.462	36.013	mg/kg	0.0036 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		64	mg/kg	1.126	63.41	mg/kg	0.00634 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	240	mg/kg		211.2	mg/kg	0.0211 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.53	mg/kg	1.353	0.631	mg/kg	0.0000631 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		19	mg/kg	2.976	49.763	mg/kg	0.00498 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		120	mg/kg	2.774	292.95	mg/kg	0.0293 %	✓	
11	pH			PH		9.4	pH		9.4	pH	9.4 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.31	mg/kg		0.273	mg/kg	0.0000273 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.13	mg/kg		0.114	mg/kg	0.0000114 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.54	mg/kg		0.475	mg/kg	0.0000475 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.41	mg/kg		0.361	mg/kg	0.0000361 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				5.2	mg/kg		4.576	mg/kg	0.000458 %	✓	
			201-581-5	85-01-8									
17		anthracene				1.1	mg/kg		0.968	mg/kg	0.0000968 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				8.8	mg/kg		7.744	mg/kg	0.000774 %	✓	
			205-912-4	206-44-0									
19		pyrene				8	mg/kg		7.04	mg/kg	0.000704 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				4.4	mg/kg		3.872	mg/kg	0.000387 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				3.8	mg/kg		3.344	mg/kg	0.000334 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				5.2	mg/kg		4.576	mg/kg	0.000458 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.7	mg/kg		1.496	mg/kg	0.00015 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				4.6	mg/kg		4.048	mg/kg	0.000405 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				3.3	mg/kg		2.904	mg/kg	0.00029 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.73	mg/kg		0.642	mg/kg	0.0000642 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				2.7	mg/kg		2.376	mg/kg	0.000238 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				24	mg/kg	1.785	37.703	mg/kg	0.00377 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0764 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP125/D2-14/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP125/D2-14/07/2020-0.30
Sample Depth:
0.30-1.20 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		24 mg/kg	1.32	28.202 mg/kg	0.00282 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	cadmium { cadmium oxide }		0.49 mg/kg	1.142	0.498 mg/kg	0.0000498 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		17 mg/kg	1.462	22.113 mg/kg	0.00221 %	✓	
	/ 215-160-9 / 1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
	024-001-00-0 / 215-607-8 / 1333-82-0							
5	copper { dicopper oxide; copper (I) oxide }		53 mg/kg	1.126	53.108 mg/kg	0.00531 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	120 mg/kg		106.8 mg/kg	0.0107 %	✓	
	082-001-00-6 / /							
7	mercury { mercury dichloride }		0.26 mg/kg	1.353	0.313 mg/kg	0.0000313 %	✓	
	080-010-00-X / 231-299-8 / 7487-94-7							
8	nickel { nickel chromate }		21 mg/kg	2.976	55.626 mg/kg	0.00556 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<**LOD**
	034-002-00-8 / /							
10	zinc { zinc chromate }		100 mg/kg	2.774	246.899 mg/kg	0.0247 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
11	pH		9.4 pH		9.4 pH	9.4 pH		
	/ / PH							
12	naphthalene		1.7 mg/kg		1.513 mg/kg	0.000151 %	✓	
	601-052-00-2 / 202-049-5 / 91-20-3							
13	acenaphthylene		4 mg/kg		3.56 mg/kg	0.000356 %	✓	
	/ 205-917-1 / 208-96-8							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				3.5	mg/kg		3.115	mg/kg	0.000312 %	✓	
			201-469-6	83-32-9									
15		fluorene				5.6	mg/kg		4.984	mg/kg	0.000498 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				54	mg/kg		48.06	mg/kg	0.00481 %	✓	
			201-581-5	85-01-8									
17		anthracene				13	mg/kg		11.57	mg/kg	0.00116 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				60	mg/kg		53.4	mg/kg	0.00534 %	✓	
			205-912-4	206-44-0									
19		pyrene				49	mg/kg		43.61	mg/kg	0.00436 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				28	mg/kg		24.92	mg/kg	0.00249 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				22	mg/kg		19.58	mg/kg	0.00196 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				29	mg/kg		25.81	mg/kg	0.00258 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				11	mg/kg		9.79	mg/kg	0.000979 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				29	mg/kg		25.81	mg/kg	0.00258 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				20	mg/kg		17.8	mg/kg	0.00178 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				3.3	mg/kg		2.937	mg/kg	0.000294 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				14	mg/kg		12.46	mg/kg	0.00125 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				20	mg/kg	1.785	31.776	mg/kg	0.00318 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0856 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP122/D2-14/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP122/D2-14/07/2020-0.30
Sample Depth:
0.30-0.80 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22	mg/kg	1.32	25.852	mg/kg	0.00259 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.71	mg/kg	1.142	0.722	mg/kg	0.0000722 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		75	mg/kg	1.462	97.559	mg/kg	0.00976 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		57	mg/kg	1.126	57.116	mg/kg	0.00571 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	210	mg/kg		186.9	mg/kg	0.0187 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.53	mg/kg	1.353	0.638	mg/kg	0.0000638 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		22	mg/kg	2.976	58.275	mg/kg	0.00583 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.32	mg/kg	2.554	0.727	mg/kg	0.0000727 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		180	mg/kg	2.774	444.418	mg/kg	0.0444 %	✓	
11	pH			PH		9.6	pH		9.6	pH	9.6 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.52	mg/kg		0.463	mg/kg	0.0000463 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.17	mg/kg		0.151	mg/kg	0.0000151 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.64	mg/kg		0.57	mg/kg	0.000057 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.6	mg/kg		0.534	mg/kg	0.0000534 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				5.8	mg/kg		5.162	mg/kg	0.000516 %	✓	
			201-581-5	85-01-8									
17		anthracene				1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				8.6	mg/kg		7.654	mg/kg	0.000765 %	✓	
			205-912-4	206-44-0									
19		pyrene				7.2	mg/kg		6.408	mg/kg	0.000641 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				4.3	mg/kg		3.827	mg/kg	0.000383 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				3.5	mg/kg		3.115	mg/kg	0.000312 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				4.6	mg/kg		4.094	mg/kg	0.000409 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.4	mg/kg		1.246	mg/kg	0.000125 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				4.3	mg/kg		3.827	mg/kg	0.000383 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				2.8	mg/kg		2.492	mg/kg	0.000249 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.53	mg/kg		0.472	mg/kg	0.0000472 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.9	mg/kg		1.691	mg/kg	0.000169 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				22	mg/kg	1.785	34.954	mg/kg	0.0035 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0951 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP126/D1-14/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP126/D1-14/07/2020-0.30
Sample Depth:
0.30-0.70 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		41	mg/kg	1.32	47.637	mg/kg	0.00476 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.74	mg/kg	1.142	0.744	mg/kg	0.0000744 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	34.727	mg/kg	0.00347 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		250	mg/kg	1.126	247.695	mg/kg	0.0248 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	260	mg/kg		228.8	mg/kg	0.0229 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.2	mg/kg	1.353	1.429	mg/kg	0.000143 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		36	mg/kg	2.976	94.288	mg/kg	0.00943 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.33	mg/kg	2.554	0.742	mg/kg	0.0000742 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		200	mg/kg	2.774	488.25	mg/kg	0.0488 %	✓	
11	pH			PH		8.5	pH		8.5	pH	8.5 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		2.6	mg/kg		2.288	mg/kg	0.000229 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.41	mg/kg		0.361	mg/kg	0.0000361 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.98	mg/kg		0.862	mg/kg	0.0000862 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.2	mg/kg		1.056	mg/kg	0.000106 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				8.8	mg/kg		7.744	mg/kg	0.000774 %	✓	
			201-581-5	85-01-8									
17		anthracene				1.9	mg/kg		1.672	mg/kg	0.000167 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				9	mg/kg		7.92	mg/kg	0.000792 %	✓	
			205-912-4	206-44-0									
19		pyrene				9.3	mg/kg		8.184	mg/kg	0.000818 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				4.8	mg/kg		4.224	mg/kg	0.000422 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				4.4	mg/kg		3.872	mg/kg	0.000387 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				5.6	mg/kg		4.928	mg/kg	0.000493 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.9	mg/kg		1.672	mg/kg	0.000167 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				5.2	mg/kg		4.576	mg/kg	0.000458 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				3.2	mg/kg		2.816	mg/kg	0.000282 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.66	mg/kg		0.581	mg/kg	0.0000581 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				2.6	mg/kg		2.288	mg/kg	0.000229 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				29	mg/kg	1.785	45.558	mg/kg	0.00456 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.125 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP123/D2-14/07/2020-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP123/D2-14/07/2020-0.30
Sample Depth:
0.30-0.90 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		34	mg/kg	1.32	39.055	mg/kg	0.00391 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.33	mg/kg	1.142	0.328	mg/kg	0.0000328 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20	mg/kg	1.462	25.431	mg/kg	0.00254 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		78	mg/kg	1.126	76.403	mg/kg	0.00764 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	230	mg/kg		200.1	mg/kg	0.02 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.73	mg/kg	1.353	0.86	mg/kg	0.000086 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23	mg/kg	2.976	59.555	mg/kg	0.00596 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		89	mg/kg	2.774	214.802	mg/kg	0.0215 %	✓	
11	pH			PH		10.6	pH		10.6	pH	10.6 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.36	mg/kg		0.313	mg/kg	0.0000313 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.18	mg/kg		0.157	mg/kg	0.0000157 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.59	mg/kg		0.513	mg/kg	0.0000513 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.44	mg/kg		0.383	mg/kg	0.0000383 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				6.3	mg/kg		5.481	mg/kg	0.000548 %	✓	
			201-581-5	85-01-8									
17		anthracene				1.4	mg/kg		1.218	mg/kg	0.000122 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				9.9	mg/kg		8.613	mg/kg	0.000861 %	✓	
			205-912-4	206-44-0									
19		pyrene				9.1	mg/kg		7.917	mg/kg	0.000792 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				4.4	mg/kg		3.828	mg/kg	0.000383 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				4.1	mg/kg		3.567	mg/kg	0.000357 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				5.1	mg/kg		4.437	mg/kg	0.000444 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.6	mg/kg		1.392	mg/kg	0.000139 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				5.1	mg/kg		4.437	mg/kg	0.000444 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				3.5	mg/kg		3.045	mg/kg	0.000305 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.6	mg/kg		0.522	mg/kg	0.0000522 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				2.3	mg/kg		2.001	mg/kg	0.0002 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				29	mg/kg	1.785	45.04	mg/kg	0.0045 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0711 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP121/D1-14/07/2020-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP121/D1-14/07/2020-0.20
Sample Depth:
0.20-1.10 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	arsenic { arsenic trioxide }		16 mg/kg	1.32	18.801 mg/kg	0.00188 %	✓	
	033-003-00-0 / 215-481-4 / 1327-53-3							
2	boron { diboron trioxide; boric oxide }		0.62 mg/kg	3.22	1.777 mg/kg	0.000178 %	✓	
	005-008-00-8 / 215-125-8 / 1303-86-2							
3	cadmium { cadmium oxide }		0.27 mg/kg	1.142	0.275 mg/kg	0.0000275 %	✓	
	048-002-00-0 / 215-146-2 / 1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		16 mg/kg	1.462	20.813 mg/kg	0.00208 %	✓	
	/ 215-160-9 / 1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
	024-001-00-0 / 215-607-8 / 1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }		32 mg/kg	1.126	32.065 mg/kg	0.00321 %	✓	
	029-002-00-X / 215-270-7 / 1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	130 mg/kg		115.7 mg/kg	0.0116 %	✓	
	082-001-00-6 / /							
8	mercury { mercury dichloride }		0.53 mg/kg	1.353	0.638 mg/kg	0.0000638 %	✓	
	080-010-00-X / 231-299-8 / 7487-94-7							
9	nickel { nickel chromate }		18 mg/kg	2.976	47.68 mg/kg	0.00477 %	✓	
	028-035-00-7 / 238-766-5 / 14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		0.41 mg/kg	2.554	0.932 mg/kg	0.0000932 %	✓	
	034-002-00-8 / /							
11	zinc { zinc chromate }		55 mg/kg	2.774	135.794 mg/kg	0.0136 %	✓	
	024-007-00-3 / 236-878-9 / 13530-65-9							
12	TPH (C6 to C40) petroleum group		10 mg/kg		8.9 mg/kg	0.00089 %	✓	
	/ / TPH							
13	confirm TPH has NOT arisen from diesel or petrol		☑					
	/ /							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
20		pH				10.4	pH		10.4	pH	10.4 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				1.7	mg/kg		1.513	mg/kg	0.000151 %	✓	
			201-581-5	85-01-8									
26		anthracene				0.43	mg/kg		0.383	mg/kg	0.0000383 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				2.6	mg/kg		2.314	mg/kg	0.000231 %	✓	
			205-912-4	206-44-0									
28		pyrene				2.6	mg/kg		2.314	mg/kg	0.000231 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				1.6	mg/kg		1.424	mg/kg	0.000142 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				1.2	mg/kg		1.068	mg/kg	0.000107 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				1.8	mg/kg		1.602	mg/kg	0.00016 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.52	mg/kg		0.463	mg/kg	0.0000463 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				1.7	mg/kg		1.513	mg/kg	0.000151 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				1.2	mg/kg		1.068	mg/kg	0.000107 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.27	mg/kg		0.24	mg/kg	0.000024 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				1	mg/kg		0.89	mg/kg	0.000089 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				18	mg/kg	1.785	28.599	mg/kg	0.00286 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0429 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00089%)

Classification of sample: TP129/D1-14/07/2020-0.10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP129/D1-14/07/2020-0.10
Sample Depth:
0.10-1.00 m
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		37 mg/kg	1.32	41.036 mg/kg	0.0041 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.34 mg/kg	1.142	0.326 mg/kg	0.0000326 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	24.554 mg/kg	0.00246 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		140 mg/kg	1.126	132.404 mg/kg	0.0132 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	170 mg/kg		142.8 mg/kg	0.0143 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.7 mg/kg	1.353	0.796 mg/kg	0.0000796 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		58 mg/kg	2.976	145.004 mg/kg	0.0145 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.6 mg/kg	2.554	3.432 mg/kg	0.000343 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		82 mg/kg	2.774	191.083 mg/kg	0.0191 %	✓	
11	pH			PH		8.4 pH		8.4 pH	8.4 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		1.2 mg/kg		1.008 mg/kg	0.000101 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.55 mg/kg		0.462 mg/kg	0.0000462 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				1	mg/kg		0.84	mg/kg	0.000084 %	✓	
			201-469-6	83-32-9									
15		fluorene				1	mg/kg		0.84	mg/kg	0.000084 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				9.4	mg/kg		7.896	mg/kg	0.00079 %	✓	
			201-581-5	85-01-8									
17		anthracene				2.6	mg/kg		2.184	mg/kg	0.000218 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				14	mg/kg		11.76	mg/kg	0.00118 %	✓	
			205-912-4	206-44-0									
19		pyrene				16	mg/kg		13.44	mg/kg	0.00134 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				14	mg/kg		11.76	mg/kg	0.00118 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				12	mg/kg		10.08	mg/kg	0.00101 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				21	mg/kg		17.64	mg/kg	0.00176 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				7.8	mg/kg		6.552	mg/kg	0.000655 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				25	mg/kg		21	mg/kg	0.0021 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				18	mg/kg		15.12	mg/kg	0.00151 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				3.9	mg/kg		3.276	mg/kg	0.000328 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				16	mg/kg		13.44	mg/kg	0.00134 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				56	mg/kg	1.785	83.975	mg/kg	0.0084 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0904 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP133/D1-14/07/2020-0.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP133/D1-14/07/2020-0.00
Sample Depth:
0.00-1.00 m
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	15.527	mg/kg	0.00155 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.66	mg/kg	1.142	0.633	mg/kg	0.0000633 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	35.603	mg/kg	0.00356 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		51	mg/kg	1.126	48.233	mg/kg	0.00482 %	✓	
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	170	mg/kg		142.8	mg/kg	0.0143 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.49	mg/kg	1.353	0.557	mg/kg	0.0000557 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23	mg/kg	2.976	57.501	mg/kg	0.00575 %	✓	
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.25	mg/kg	2.554	0.536	mg/kg	0.0000536 %	✓	
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110	mg/kg	2.774	256.331	mg/kg	0.0256 %	✓	
11		pH			PH		8.4	pH		8.4	pH	8.4 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		1.3	mg/kg		1.092	mg/kg	0.000109 %	✓	
13		acenaphthylene		205-917-1	208-96-8		0.47	mg/kg		0.395	mg/kg	0.0000395 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				1	mg/kg		0.84	mg/kg	0.000084 %	✓	
			201-469-6	83-32-9									
15		fluorene				1	mg/kg		0.84	mg/kg	0.000084 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				9.7	mg/kg		8.148	mg/kg	0.000815 %	✓	
			201-581-5	85-01-8									
17		anthracene				2	mg/kg		1.68	mg/kg	0.000168 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				14	mg/kg		11.76	mg/kg	0.00118 %	✓	
			205-912-4	206-44-0									
19		pyrene				13	mg/kg		10.92	mg/kg	0.00109 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				6.9	mg/kg		5.796	mg/kg	0.00058 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				5.9	mg/kg		4.956	mg/kg	0.000496 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				7.9	mg/kg		6.636	mg/kg	0.000664 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				2.6	mg/kg		2.184	mg/kg	0.000218 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				7.6	mg/kg		6.384	mg/kg	0.000638 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				5.8	mg/kg		4.872	mg/kg	0.000487 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.73	mg/kg		0.613	mg/kg	0.0000613 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				4.2	mg/kg		3.528	mg/kg	0.000353 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				25	mg/kg	1.785	37.489	mg/kg	0.00375 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0667 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS15 D1-1031984-13/07/2020-0.0

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS15 D1-1031984-13/07/2020-0.0
Sample Depth:
0.0-0.7 m
Moisture content:
3.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18 mg/kg	1.32	22.839 mg/kg	0.00228 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.2 mg/kg	1.142	1.317 mg/kg	0.000132 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		4.4 mg/kg	1.462	6.18 mg/kg	0.000618 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		6.8 mg/kg	1.126	7.357 mg/kg	0.000736 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	29 mg/kg		27.869 mg/kg	0.00279 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11 mg/kg	2.976	31.462 mg/kg	0.00315 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		45 mg/kg	2.774	119.968 mg/kg	0.012 %	✓	
11	pH			PH		8.4 pH		8.4 pH	8.4 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
16		phenanthrene				0.16	mg/kg		0.154	mg/kg	0.0000154 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.12	mg/kg		0.115	mg/kg	0.0000115 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				0.26	mg/kg		0.25	mg/kg	0.000025 %	✓	
			205-912-4	206-44-0									
19		pyrene				0.25	mg/kg		0.24	mg/kg	0.000024 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				0.18	mg/kg		0.173	mg/kg	0.0000173 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				0.2	mg/kg		0.192	mg/kg	0.0000192 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				0.26	mg/kg		0.25	mg/kg	0.000025 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.18	mg/kg		0.173	mg/kg	0.0000173 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.2	mg/kg		0.192	mg/kg	0.0000192 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.12	mg/kg		0.115	mg/kg	0.0000115 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.11	mg/kg		0.106	mg/kg	0.0000106 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				5.5	mg/kg	1.785	9.436	mg/kg	0.000944 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.023 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS15 D2-1031985-13/07/2020-0.8

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS15 D2-1031985-13/07/2020-0.8
Sample Depth:
0.8-1.0 m
Moisture content:
9.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.6% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1		pH		PH		8.3 pH		8.3 pH	8.3 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS17 D1-1031986-13/07/2020-0.6

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS17 D1-1031986-13/07/2020-0.6
Sample Depth:
0.6-1.0 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		39	mg/kg	1.32	42.224	mg/kg	0.00422 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.54	mg/kg	1.142	0.506	mg/kg	0.0000506 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16	mg/kg	1.462	19.176	mg/kg	0.00192 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		130	mg/kg	1.126	120.02	mg/kg	0.012 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	430	mg/kg		352.6	mg/kg	0.0353 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.6	mg/kg	1.353	1.776	mg/kg	0.000178 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		31	mg/kg	2.976	75.657	mg/kg	0.00757 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.6	mg/kg	2.554	1.256	mg/kg	0.000126 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		250	mg/kg	2.774	568.7	mg/kg	0.0569 %	✓	
11	pH			PH		8.1	pH		8.1	pH	8.1 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-469-6	83-32-9									
15		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-695-5	86-73-7									
16		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			201-581-5	85-01-8									
17		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-371-1	120-12-7									
18		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-912-4	206-44-0									
19		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				38	mg/kg	1.785	55.626	mg/kg	0.00556 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.124 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS18 D2-1031991-13/07/2020-0.4

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS18 D2-1031991-13/07/2020-0.4
Sample Depth:
0.4-1.0 m
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	20.439	mg/kg	0.00204 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.29	mg/kg	1.142	0.285	mg/kg	0.0000285 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	27.653	mg/kg	0.00277 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		48	mg/kg	1.126	46.477	mg/kg	0.00465 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	300	mg/kg		258	mg/kg	0.0258 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.4	mg/kg	1.353	0.466	mg/kg	0.0000466 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23	mg/kg	2.976	58.871	mg/kg	0.00589 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.36	mg/kg	2.554	0.791	mg/kg	0.0000791 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		150	mg/kg	2.774	357.865	mg/kg	0.0358 %	✓	
11	pH			PH		8.1	pH		8.1	pH	8.1 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.69	mg/kg		0.593	mg/kg	0.0000593 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.29	mg/kg		0.249	mg/kg	0.0000249 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				1.5	mg/kg		1.29	mg/kg	0.000129 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.4	mg/kg		1.204	mg/kg	0.00012 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				12	mg/kg		10.32	mg/kg	0.00103 %	✓	
			201-581-5	85-01-8									
17		anthracene				3.5	mg/kg		3.01	mg/kg	0.000301 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				19	mg/kg		16.34	mg/kg	0.00163 %	✓	
			205-912-4	206-44-0									
19		pyrene				17	mg/kg		14.62	mg/kg	0.00146 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				8.5	mg/kg		7.31	mg/kg	0.000731 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				7.7	mg/kg		6.622	mg/kg	0.000662 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				10	mg/kg		8.6	mg/kg	0.00086 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				3.9	mg/kg		3.354	mg/kg	0.000335 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				9.2	mg/kg		7.912	mg/kg	0.000791 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				6.6	mg/kg		5.676	mg/kg	0.000568 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				1.1	mg/kg		0.946	mg/kg	0.0000946 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				4.7	mg/kg		4.042	mg/kg	0.000404 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				26	mg/kg	1.785	39.917	mg/kg	0.00399 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0904 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS16 D2-1031995-13/07/2020-1.5

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS16 D2-1031995-13/07/2020-1.5
Sample Depth:
1.5-1.5 m
Moisture content:
26%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 26% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		140	mg/kg	1.32	136.786	mg/kg	0.0137 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.191	mg/kg	0.000119 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.68	mg/kg	1.142	0.575	mg/kg	0.0000575 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33	mg/kg	1.462	35.691	mg/kg	0.00357 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		210	mg/kg	1.126	174.963	mg/kg	0.0175 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	600	mg/kg		444	mg/kg	0.0444 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		11	mg/kg	1.353	11.017	mg/kg	0.0011 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		88	mg/kg	2.976	193.814	mg/kg	0.0194 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.4	mg/kg	2.554	2.646	mg/kg	0.000265 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		420	mg/kg	2.774	862.205	mg/kg	0.0862 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				5.2	mg/kg	1.884	7.25	mg/kg	0.000725 %	✓	
		006-007-00-5											
19		pH				7.4	pH		7.4	pH	7.4 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
24		phenanthrene				1.5	mg/kg		1.11	mg/kg	0.000111 %	✓	
			201-581-5	85-01-8									
25		anthracene				0.34	mg/kg		0.252	mg/kg	0.0000252 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				2.5	mg/kg		1.85	mg/kg	0.000185 %	✓	
			205-912-4	206-44-0									
27		pyrene				2.7	mg/kg		1.998	mg/kg	0.0002 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				1.6	mg/kg		1.184	mg/kg	0.000118 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				1.5	mg/kg		1.11	mg/kg	0.000111 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				2.4	mg/kg		1.776	mg/kg	0.000178 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.72	mg/kg		0.533	mg/kg	0.0000533 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				2	mg/kg		1.48	mg/kg	0.000148 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				1.7	mg/kg		1.258	mg/kg	0.000126 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.36	mg/kg		0.266	mg/kg	0.0000266 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				1.3	mg/kg		0.962	mg/kg	0.0000962 %	✓	
			205-883-8	191-24-2									
36		vanadium { divanadium pentaoxide; vanadium pentoxide }				97	mg/kg	1.785	128.141	mg/kg	0.0128 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.202 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS14B D1-1031998-13/07/2020-0.4

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS14B D1-1031998-13/07/2020-0.4
Sample Depth:
0.4-1.0 m
Moisture content:
3.8%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		42 mg/kg	1.32	53.346 mg/kg	0.00533 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.63 mg/kg	1.142	0.692 mg/kg	0.0000692 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	46.399 mg/kg	0.00464 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		77 mg/kg	1.126	83.399 mg/kg	0.00834 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	470 mg/kg		452.14 mg/kg	0.0452 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.87 mg/kg	1.353	1.133 mg/kg	0.000113 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		32 mg/kg	2.976	91.621 mg/kg	0.00916 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		200 mg/kg	2.774	533.746 mg/kg	0.0534 %	✓	
11	pH			PH		10.7 pH		10.7 pH	10.7 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.27 mg/kg		0.26 mg/kg	0.000026 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.12 mg/kg		0.115 mg/kg	0.0000115 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.25	mg/kg		0.241	mg/kg	0.0000241 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.16	mg/kg		0.154	mg/kg	0.0000154 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				2.2	mg/kg		2.116	mg/kg	0.000212 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.5	mg/kg		0.481	mg/kg	0.0000481 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				4.2	mg/kg		4.04	mg/kg	0.000404 %	✓	
			205-912-4	206-44-0									
19		pyrene				4	mg/kg		3.848	mg/kg	0.000385 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				2.2	mg/kg		2.116	mg/kg	0.000212 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				2.1	mg/kg		2.02	mg/kg	0.000202 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				3.2	mg/kg		3.078	mg/kg	0.000308 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.1	mg/kg		1.058	mg/kg	0.000106 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				2.9	mg/kg		2.79	mg/kg	0.000279 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				2.3	mg/kg		2.213	mg/kg	0.000221 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.39	mg/kg		0.375	mg/kg	0.0000375 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.6	mg/kg		1.539	mg/kg	0.000154 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				37	mg/kg	1.785	63.542	mg/kg	0.00635 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.135 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS14B D2-1031999-13/07/2020-1.6

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
WS14B D2-1031999-13/07/2020-1.6
Sample Depth:
1.6-2.0 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.82%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.82%)

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		51	mg/kg	1.32	55.216	mg/kg	0.00552 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1.8	mg/kg	3.22	4.753	mg/kg	0.000475 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.77	mg/kg	1.142	0.721	mg/kg	0.0000721 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24	mg/kg	1.462	28.763	mg/kg	0.00288 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		340	mg/kg	1.126	313.898	mg/kg	0.0314 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	500	mg/kg		410	mg/kg	0.041 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		2.2	mg/kg	1.353	2.442	mg/kg	0.000244 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39	mg/kg	2.976	95.181	mg/kg	0.00952 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.75	mg/kg	2.554	1.57	mg/kg	0.000157 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		280	mg/kg	2.774	636.944	mg/kg	0.0637 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		10000	mg/kg		8200	mg/kg	0.82 %	✓	
13	confirm TPH has NOT arisen from diesel or petrol					☑							
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				1.5	mg/kg	1.884	2.317	mg/kg	0.000232 %	✓	
20	pH			PH		8.4	pH		8.4	pH	8.4 pH		
21	naphthalene	601-052-00-2	202-049-5	91-20-3		13	mg/kg		10.66	mg/kg	0.00107 %	✓	
22	acenaphthylene		205-917-1	208-96-8		6	mg/kg		4.92	mg/kg	0.000492 %	✓	
23	acenaphthene		201-469-6	83-32-9		110	mg/kg		90.2	mg/kg	0.00902 %	✓	
24	fluorene		201-695-5	86-73-7		66	mg/kg		54.12	mg/kg	0.00541 %	✓	
25	phenanthrene		201-581-5	85-01-8		450	mg/kg		369	mg/kg	0.0369 %	✓	
26	anthracene		204-371-1	120-12-7		120	mg/kg		98.4	mg/kg	0.00984 %	✓	
27	fluoranthene		205-912-4	206-44-0		510	mg/kg		418.2	mg/kg	0.0418 %	✓	
28	pyrene		204-927-3	129-00-0		430	mg/kg		352.6	mg/kg	0.0353 %	✓	
29	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		190	mg/kg		155.8	mg/kg	0.0156 %	✓	
30	chrysene	601-048-00-0	205-923-4	218-01-9		190	mg/kg		155.8	mg/kg	0.0156 %	✓	
31	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		210	mg/kg		172.2	mg/kg	0.0172 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
32		benzo[k]fluoranthene				79	mg/kg		64.78	mg/kg	0.00648 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				170	mg/kg		139.4	mg/kg	0.0139 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				86	mg/kg		70.52	mg/kg	0.00705 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				23	mg/kg		18.86	mg/kg	0.00189 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				100	mg/kg		82	mg/kg	0.0082 %	✓	
			205-883-8	191-24-2									
37		vanadium { divanadium pentaoxide; vanadium pentoxide }				38	mg/kg	1.785	55.626	mg/kg	0.00556 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	1.207 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.82%)

Classification of sample: WS14B D3-1032000-13/07/2020-4.0

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
WS14B D3-1032000-13/07/2020-4.0
Sample Depth:
4.0-4.5 m
Moisture content:
26%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.192%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.192%)

Determinands

Moisture content: 26% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		2600	mg/kg		1924	mg/kg	0.192 %	✓	
2		confirm TPH has NOT arisen from diesel or petrol					☑							
3		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
4		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
5		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
6		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
7		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]							
								Total:	0.192 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection
ND	Not detected

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.192%)

Classification of sample: WS10 D1-1032001-13/07/2020-0.0

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS10 D1-1032001-13/07/2020-0.0
Sample Depth:
0.0-0.3 m
Moisture content:
19%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	19.25	mg/kg	0.00193 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5	mg/kg	1.142	1.388	mg/kg	0.000139 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		290	mg/kg	1.462	343.319	mg/kg	0.0343 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		74	mg/kg	1.126	67.486	mg/kg	0.00675 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	250	mg/kg		202.5	mg/kg	0.0202 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.76	mg/kg	1.353	0.833	mg/kg	0.0000833 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		22	mg/kg	2.976	53.037	mg/kg	0.0053 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.58	mg/kg	2.554	1.2	mg/kg	0.00012 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		190	mg/kg	2.774	426.941	mg/kg	0.0427 %	✓	
11	pH			PH		7.6	pH		7.6	pH	7.6 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.76	mg/kg		0.616	mg/kg	0.0000616 %	✓	
13	acenaphthylene		205-917-1	208-96-8		0.12	mg/kg		0.0972	mg/kg	0.00000972 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				2.8	mg/kg		2.268	mg/kg	0.000227 %	✓	
			201-469-6	83-32-9									
15		fluorene				1.9	mg/kg		1.539	mg/kg	0.000154 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				11	mg/kg		8.91	mg/kg	0.000891 %	✓	
			201-581-5	85-01-8									
17		anthracene				2.9	mg/kg		2.349	mg/kg	0.000235 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				13	mg/kg		10.53	mg/kg	0.00105 %	✓	
			205-912-4	206-44-0									
19		pyrene				11	mg/kg		8.91	mg/kg	0.000891 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				5.7	mg/kg		4.617	mg/kg	0.000462 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				5.3	mg/kg		4.293	mg/kg	0.000429 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				6.8	mg/kg		5.508	mg/kg	0.000551 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				2.3	mg/kg		1.863	mg/kg	0.000186 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				5.7	mg/kg		4.617	mg/kg	0.000462 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				4	mg/kg		3.24	mg/kg	0.000324 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.74	mg/kg		0.599	mg/kg	0.0000599 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				3.1	mg/kg		2.511	mg/kg	0.000251 %	✓	
			205-883-8	191-24-2									
28		vanadium { divanadium pentaoxide; vanadium pentoxide }				18	mg/kg	1.785	26.028	mg/kg	0.0026 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.121 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

- **lead compounds with the exception of those specified elsewhere in this Annex**

CLP index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers many simple lead compounds to be Carcinogenic category 2
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

worst case/most likely scenario

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2020.224.4427.8663 (11 Aug 2020)
HazWasteOnline Database: 2020.224.4427.8663 (11 Aug 2020)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Appendix J

JIWG Output Sheets

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Decision Support Tool for Receptor Risk Ranking

Stage 1

Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Clearly identifiable insulating board	2
Extent of degradation of ACMs	Intact (Very good condition ACM/ACM fragments	1
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Chrysotile alone	0
Sub-total		3
Hazard ranking		Very Low

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

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Stage 2

Emission Factors		Score
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Activity type and effect on deterioration of ACMs	Low disturbance, minimal deterioration expected	2
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		7
Exposure ranking		Low

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Stage 3

Pathway and Receptor Sensitivity		Score	
Receptor category	Residential	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	< 1 hour in any single day (e.g. frequent but short exposure event)	1	
Receptor ranking		5	Medium
Combined hazard, exposure and receptor ranking			Low
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D	
Pathway ranking		4D	Medium
Overall ranking			Low

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Project Reference	LKC 20 1120

Site Name	Collyhurst Village
Client	Far East Consortium International Ltd

Run by	HM
Date	27th August 2020
Reviewed by	PQ

Characterisation of scenario being evaluated	Chrysotile loose fibres

Interpretation of scenario ranking by DST	Low risk due to type of ACM and LOD concentrations.

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JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC 20 1120
Site Name	Collyhurst Village
Client	Far East Consortium
Run by	HM
Date	27th August 2020
Scenario details	

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Clearly identifiable insulating board	2
Extent of degradation of ACMs at outset of work	Intact (Very good condition ACM/ACM fragments	1
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Large quantities - >0.1 %wt/wt	4
Sub-total		**8**

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking **Low**

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

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Stage 2

Exposure Factors

		Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.001 fibres/ml	0
Anticipated duration of exposure to asbestos	< 2 hours in a 7 day period for all persons involved (e.g. Short Duration Work)	1
Activity type and effect on deterioration of ACMs during work	Sampling, manual or mechanical (no or minimal deterioration expected)	0
Best description of primary host material matrix (soil/made ground)	Coarse to Fine Sand	2
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Low	2
Sub-total		**5**
Exposure ranking		Very low
Combined hazard and exposure ranking	**13**	Low

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Stage 3

Risk Assessment Outputs

Probable Licensing Status	Non-Licensed Work
RPE*	EN149 type FFP3 disposable
Dust Suppression**	Manual/localised dust suppression
Hygiene/Decontamination***	Localised and basic personal decontamination facilities

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.
**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)
***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

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Appendix J

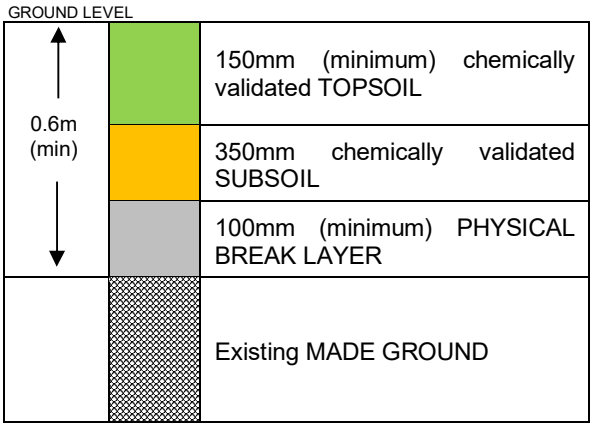
Environmental Cover System Construction

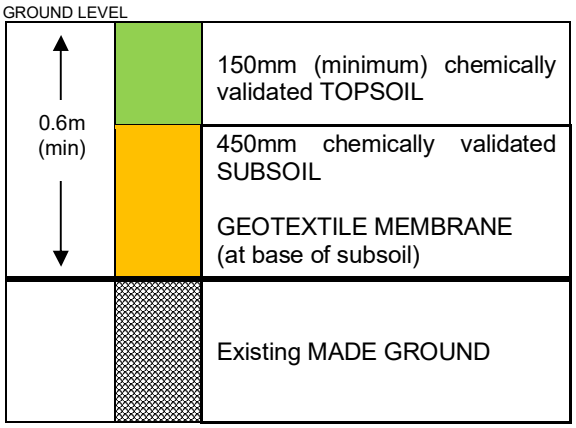
Private Gardens
Shared Landscaping

PRIVATE BACK GARDENS:

Requires 600mm environmental cover system.

Either (physical break layer) Or (geotextile membrane)

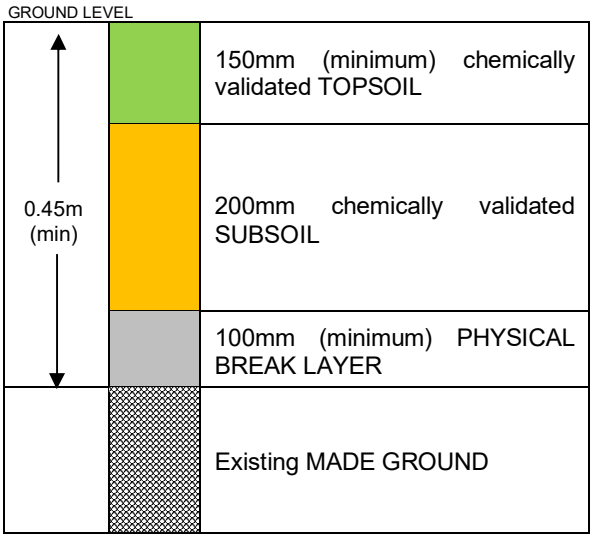


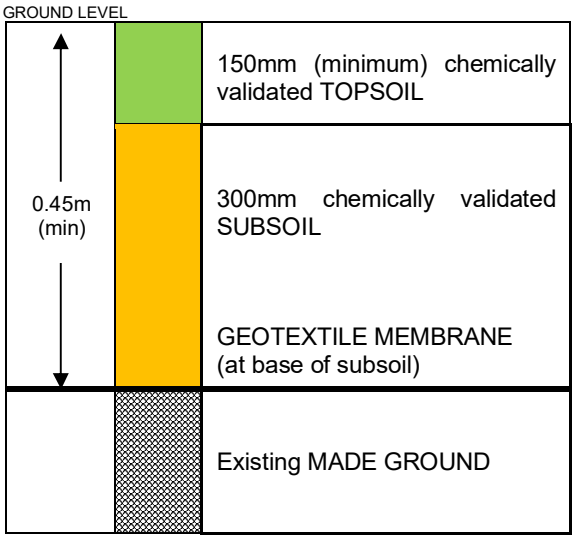


PRIVATE FRONT GARDENS / SHARED LANDSCAPING:

Requires 450mm environmental cover system.

Either (physical break layer) Or (geotextile membrane)





Hardstood Areas – No Remediation Required

From current data and current site layout. No specific remediation required in landscaped area around apartment block, small verges around duplex buildings and POS area. Therefore, nominal 150mm topsoil cover

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DRAFT

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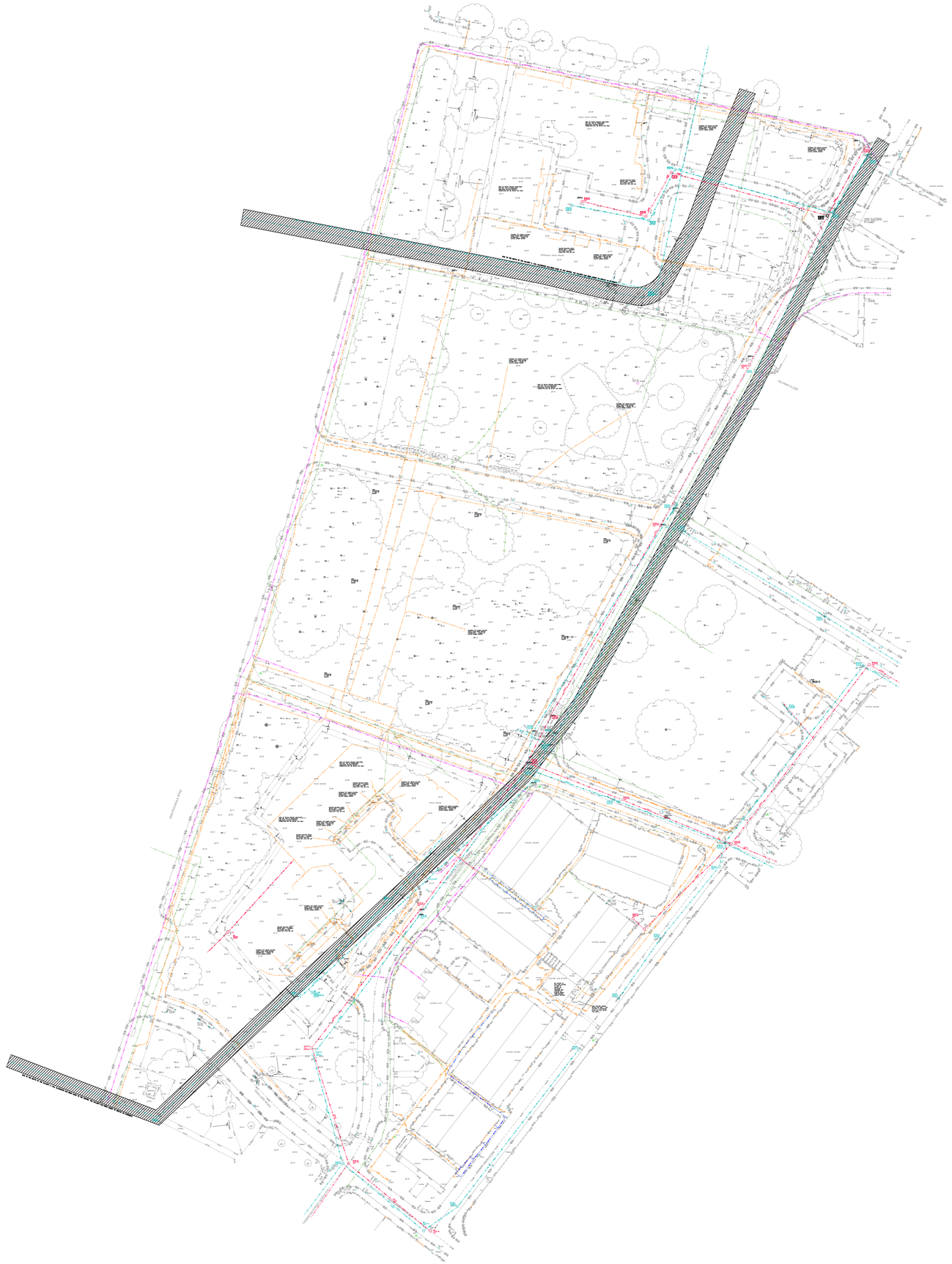
- Contaminated Land
- Flood Risk and Drainage
- Asbestos
- Invasive Species
- Land Remediation
- Project Management
- Land Drilling



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PLAN GRID NORTH

File Name: Collyhurst Drainage and Utils Layer.dwg

LEGEND

AV	AIR VALVE
BC	BOUNDARY COVER
CB	CONTROL BOX
CBH	CONTROL BOX HOLE
COM	COMMUNICATIONS COVER
CV	CONTROL VALVE
DR	DRAINAGE CHANNEL
DP	DOWN PIPE
EB	ELEC BOX
EIC	ELECT INSPECTION COVER
ELB	ELECTRIC BOX
EP	ELECTRIC
EP	ELECTRICITY POLE
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
GLT	GROUND LIGHT
GP	GAS POST
GSV	GAS VALVE
IC	INSPECTION COVER
LB	LETTER BOX
LP	LAMP POST
MH	MANHOLE
MK	MARKER
OP	OUTFALL PIPE
PC	PEDESTAL
PP	PETROL PUMP
RC	RODDING EYE
RWP	RAINWATER PIPE
SIP	SOIL VENT PIPE
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TP	TELEGRAPH POST
TLB	TRAFFIC LIGHT BOX
TP	TELEGRAPH POLE
TR	TRIAL HOLE
WC	WATER OUTLET
WST	WATER STOP TAP
WSV	WATER STOP VALVE
EOT	END OF TRACE
LOA	LIMIT OF SURVEY AREA
U/S	UNABLE TO LIFT
U/TS	UNABLE TO SONDE
U/T	UNABLE TO TRACE
S/L	SIGNAL LOSS
BLK	BLOCKED
GPR	BACKDROP GPR CONTACTS
BD	BACKDROP INVE
TOP	TOP OF PIPE
INV	INVERT
	EXIT SYMBOL

BT	BT
CD	CABLE DUCT
CCTV	CCTV
TC	TELECOMS
ELEC	ELECTRIC
FIBRE OPTICS	FIBRE OPTICS
GAS	GAS
GTC	GAS TRANSMISSION LINE
MW	MAINS WATER
SW	SURFACE WATER
SWD	SURFACE WATER
SWF	SEWER FM
SWP	SEWER PUMP
TRANS	TRANSMISSION CABLE
UNDEF	UNIDENTIFIED TRACE
UNID	UNIDENTIFIED UTILITY
UP	UNIDENTIFIED PIPE
VIRGIN	VIRGIN DETECTION CABLE
	SURVEY BOUNDARY

FROM STATUTORY AUTHORITY PLANS

BT	
CD	CABLE DUCT
CATV	CATV
CCTV	CCTV
TC	TELECOMS
ELEC	ELECTRIC
MAINS GAS	MAINS GAS
MAINS WATER	MAINS WATER
SEWER CW	SEWER CW
SEWER FM	SEWER FM
SEWER SW	SEWER SW
FIBRE OPTICS	FIBRE OPTICS

NOTES:

All levels relate to O.S (Newlyn) Datum. Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

Services shown as 'From Statutory Authority Plans' line styles are taken from Statutory Records plans supplied by the relevant regional authority. These services were not located and are shown for indicative purposes only.

DISCLAIMER:

At Layer Surveys staff use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of Layer Surveys. Therefore Layer Surveys

cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, unnotated line. The displayed depth will refer to the shallowest detected utility.

Successful tracing of non-conductive materials may be limited. Drainage gulleys are dye tested where possible to prove connectivity but it is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to Layer Surveys by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).

SHEET LAYOUT

0 10m 20m 40m 60m 80m

SCALE BAR

REV	DATE	DESCRIPTION

Layer Surveys Ltd
See the Complete Picture

Client

Project Title
Collyhurst
Manchester

Surveyed	Drawn	Checked			
C.T	G.B	D.W			
Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	May 20	Lay0315	01	A0	01

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PLAN GRID NORTH

File Name: Coltyhurst Drainage and Utils Layer.dwg

LEGEND

AV	AIR VALVE
BI	BOUNDARY INSPECTION COVER
CB	CONTROL BOX
CP	CONTROL BOX VENT
COM	COMMUNICATIONS COVER
CV	CHECK VALVE
DI	DRAINAGE CHANNEL
DP	DOWN PIPE
EB	ELEC BOX
EC	ELECT INSPECTION COVER
ELB	ELECTRIC BOX
EP	ELECT POST
EP	ELECTRICITY POLE
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
GLT	GROUND LIGHT
GP	GUARD POST
GV	GAS VALVE
IC	INSPECTION COVER
LP	LAMP POST
PO	KERB OUTLET
LP	LAMP POST
MH	MANHOLE
MK	MARKER
OP	OUTFALL PIPE
PP	POWER POST
PU	PETROL PUMP
RG	RODDING EYE
RWP	RAINWATER PIPE
SP	SOIL VENT PIPE
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TP	TELEGRAPH POLE
TLB	TRAFFIC LIGHT BOX
TP	TELEGRAPH POLE
WC	WATER COURSE
WO	WATER OUTLET
WST	WATER STOP TAP
WSV	WATER STOP VALVE
EOT	END OF TRACE
NAD	NO ACCESS OR AREA
U/S	UNABLE TO LIFT
U/S	UNABLE TO SONDE
S.T.	SURVEY TRACE
S.S.	SIGNAL LOSS
BLK	BLOCKED
GPR	BOREHOLE GPR CONTACTS
BD	BACKDROP PIPE
SUP	TO SUPPLY PIPE
INP	TO INLET PIPE
⊔	EXIT SYMBOL

BT	BT
DUCT	CABLE DUCT
CATV	CABLE TV
OCTV	OCTV
TELECOM	TELECOMS
ELECTRIC STRIP	ELECTRIC
FIBRE OPTICS	FIBRE OPTICS
PL	PIPE LINE
GAS	GAS
LANE	GAS SUPPLY LOW LANE
MAINS GAS	MAINS GAS
MAINS WATER	MAINS WATER
SEWER	SEWER
SEWER FW	SEWER FW
TRACE	TRACE
UNIDENTIFIED CABLE	UNIDENTIFIED CABLE
UNIDENTIFIED TRACE	UNIDENTIFIED TRACE
UNIDENTIFIED PIPE	UNIDENTIFIED PIPE
SERVICE DETECTION CABLE	SERVICE DETECTION CABLE
SURVEY BOUNDARY	SURVEY BOUNDARY

FROM STATUTORY AUTHORITY PLANS

BT	BT
CABLE DUCT	CABLE DUCT
CATV	CATV
OCTV	OCTV
TELECOMS	TELECOMS
ELECTRIC	ELECTRIC
MAINS GAS	MAINS GAS
MAINS WATER	MAINS WATER
SEWER CW	SEWER CW
SEWER FW	SEWER FW
TRACE	TRACE
FIBRE OPTICS	FIBRE OPTICS

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SHEET LAYOUT

0 10m 20m 40m 60m 80m
SCALE BAR

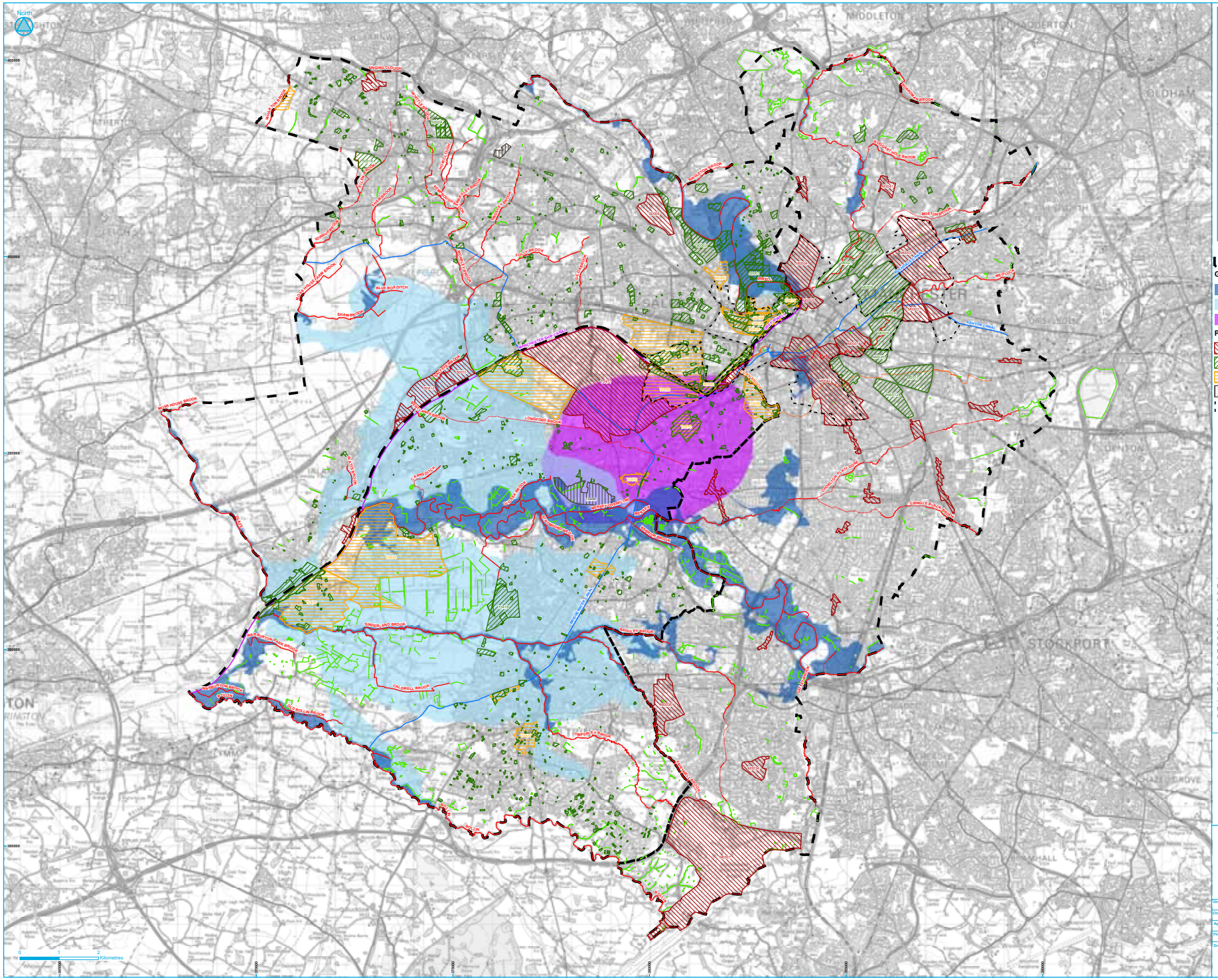
REV	DATE	DESCRIPTION

Layer Surveys Ltd
See the Complete Picture

Client

Project Title
Coltyhurst
Manchester

Surveyed	Drawn	Checked			
C.T	G.B	D.W			
Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	May 20	Lay0315	012	A0	01



The map has been produced in accordance with PPS25: Development and Flood Risk and its Practice Guide. This map shows areas that are potentially at risk from groundwater flooding and should be used to scope suitable mitigation measures in a site specific Flood Risk Assessment.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The information on the map is based on Environment Agency potential groundwater rebound areas, data from the Coal Authority, BGS drift geology mapping and Defra Groundwater Emergence Maps.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Groundwater Flooding

Drawn by:	J Cheetham	Date:	08/03/2011
Checked by:	J Dimelow	Date:	01/02/2011
Approved by:	J Cooper	Date:	01/02/2011

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File Name: ...ArcView\Mapping\Level1\MST_GroundwaterFlooding_V1.3.mxd

Drawing Number:	Status:	Scale:
GW_2.1	FINAL	1:45,000

Original @ A1

APPENDIX C

Correspondences received to date

Minutes for meeting/s with LLFA

Andrea McGee

From: Davies, Andy <Andy.Davies1@environment-agency.gov.uk>
Sent: 15 October 2020 15:53
To: Andrea McGee
Cc: Telfer, Helen; Thomas, Sandrine
Subject: RE: 201009/JPF17 1226-01-EA PDE - Collyhurst Village & Collyhurst South
Attachments: dps1.rtf; dps1.rtf

Hi Andrea,

Thank you for your pre-application enquiry.

Regarding your drainage proposals, rates of discharge will be for confirmation/acceptance by the Lead Local Flood Authority, we do not comment on this aspect at planning.

Regarding infiltration, I note that due to historic conditions / potential for contamination this approach for site drainage has been ruled out. It would be advisable to confirm as part of any subsequent planning application that infiltration will not occur and that any features which could enable infiltration e.g. swales will be lined with an impermeable membrane, or similar, if there is the possibility of remnant contamination beneath.

Regarding your FRA enquiry, please can I draw your attention to the previous letters of advice/ correspondence held with Civic Design Engineers, attached above, for the Collyhurst Village site. A check with our Flood Risk Team indicates that the post-meeting actions noted within EA letter SO/2020/120194/01-L01 have not yet occurred.

Once you have had a chance to review the attached letters and liaise with your internal team I would happy to discuss appropriate next steps.

Kind regards,

Andy

Andy Davies
Planning Advisor, Sustainable Places Team | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Email: SPPlanning.RFH@environment-agency.gov.uk
Mobile: **0739 379 8325**

I am currently working remotely and have limited access to emails due to capacity issues on our remote server.
I will respond to your email at the earliest opportunity. However, if your query is urgent please contact me on my mobile

---

From: Andrea McGee [mailto:andrea.mcgee@civicengineers.com]
Sent: 07 October 2020 15:18

To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: 201009/JPF17 1226-01-EA PDE

Good Afternoon,

We are currently in the process of developing a drainage strategy for the above sites at Collyhurst, Manchester. The proposed sites are located of Rochdale Road;

- Collyhurst Village: approximate post code is: M40 7XH and the approximate National Grid Reference is: 385601,400519.
- South Collysurst: approximate post code is: M40 7QH and the approximate National Grid Reference is: 385479,399754.

The proposed development is to comprise of up to:

- Collyhurst Village : 300 residential properties – approximate site area - 4.2ha
- South Collyhurst: 36 residential properties – approximate site area - 0.5ha

Both development boundaries are located within Flood zone 1. Neither a sequential exception testing is considered necessary for this development.

The design is still currenting a WIP and so is subject to some minor alterations as the design progresses.

The entire site is located in Flood zone 1.

Infiltration
Due to the historic nature of the site , infiltration is not considered feasible as there are a number of potential contamination sources across the sites remnant from the previous developments include asbestos, metals and hydrocarbons. Site geology is mapped as Till over Pennine Coal Measure in the north and central parts of the site. Investigation included in link.

Surface water body
The River Irk is approximately 240m west of the site. Moston Brook is culverted beneath Thornton St .

Our Drainage proposals are to collect surface water through conventional piped system that utilises Suds features within the site and a Pond to the south of the site as a form of attenuation storage. It appears that the existing UU network discharges in to the culvert. Therefore we proposed drain to the park, attenuate, discharge to the UU sewer which then discharges into the culvert. This culvert then discharges to the River Irk.

The site has been divided into 4 Catchments, A, B,C,D. We Propose to discharge Surface water at Brownfield rates, incorporating a 50% betterment.
Catchment A: Brownfield rate - 17.4l/s_ Collyhurst Village
Catchment B: Greenfield rate - 5.1/s_ Collyhurst Village
Catchment C: Brownfield rate - 17.6l/s_ Collyhurst Village
Catchment D: Brownfield rate – 22.5l/s_ Collyhurst Village
Catchment E: Brownfield rate – 15 l/s _South Collyhurst

It is proposed to discharge foul and surface water into the existing UU network located within:

- Thornton St for Collyhurst Village development.
- Winscombe Drive South Collyhurst development

A PDE has been issued to the LLFA and UU to confirmed preferred points of connections and suitable rates.

Based on the above, Can the EA provide any information that would be considered beneficial towards the FRA and obtaining a successful application.

If you require anything further from me please do not hesitate to let me know.

Civic Engineers
Carvers Warehouse 77 Dale Street
Manchester
Manchester
M1 2HG

Our ref: SO/2020/119988/01-L01
Your ref: 1226-01

Date: 04 February 2020

FAO: Peter Collier

Dear Mr Collier

PRE-APPLICATION ENQUIRY - LAND AT COLLYHURST VILLAGE, MANCHESTER

NEEDWOOD CL, MANCHESTER M40 8JN

Thank you for your pre-application enquiry. This request was received in office on the 16th January 2019.

Documentation Reviewed:

- 1226-01-CIV-XX-GA-DR-C-0001 P01 – Red Line Plan – Collyhurst Village
- EA Flood Map Planning Extract – Location: 385617/400388 Reference: Collyhurst

Environment Agency Commentary

We note from the red line plan provided (1226-01-CIV-XX-GA-DR-C-0001 P01) that the development proposal will be located in close proximity to the current alignment of Moston Brook water, part of the part of the wider River Irk WFD waterbody (Irk (Wince to Irwell, WFD Ref: GB112069061131).

From the indicative layout shown within 1226-01-CIV-XX-GA-DR-C-0001 P01, the current development proposal would involve building over/within 8 metres of the culverted watercourse, Moston Brook a designated "main river" and would not utilise current greenspace areas on site. The creation of development over a culvert is not considered good practice, as it could result in increased flood risk, cause and/or exacerbate access and maintenance issues once built and finally does not offer environmental/ecological enhancement. Consequently, as presented, it is unlikely that we would grant a Flood Risk Activity Permit for this application.

As part of any future development we would seek that developer first ascertains the possibility of de-culverting this section of the Moston Brook waterbody and where deemed impractical, based on a technical and/or financial evaluation, seeks to ensure any future development scheme avoids further deterioration of the waterbody status and condition.

We would recommend that the exact size, depth and line of the culvert is initially determined and the proposed site layout brought forward takes this information and the above EA position in consideration.

As part of your planning application you would be required to submit plans showing the exact line, size and depth of the culvert in relation to the proposed buildings. Buildings

should be sited no closer to the culvert walls than relating culvert depth below ground and development levels should provisioned which reduce the residual risk of flooding in the event of a culvert collapse or blockage. We understand that the culvert reports from our Asset Performance team have been provided to yourselves by our Customers and Engagement team under reference GMMC157479AB which should enable further investigations on both culverts.

With reference to the large areas of existing greenspace, we would recommend as part of future scheme design, ecological assessment be undertaken of the existing site to inform and shape future scheme design, and identify how new surface water drainage design will protect the Moston Brook ecological receptor, avoid new urban diffuse pollution, and look to adopt multifunctional sustainable urban drainage options where feasible. For information see:
(https://www.ciria.org//Memberships/The_SuDs_Manual_C753_Chapters.aspx)
The current indicative layout shown within 1226-01-CIV-XX-GA-DR-C-0001 P01, does not suggest these elements have been integrated as part of scheme design at present.

As part of new Environment Bill (https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018/environment-bill-summer-policy-statement-july-2019) and government's commitment to sustainable development and biodiversity net gain; as well as draft Greater Manchester Spatial Framework (https://www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework/gmsf-full-plan/) reflecting new environmental policies sought by government, future schemes such as this will likely need to show clearly how they are in accordance with this upcoming environmental policy guidance.

We would request the applicant review the layout and provide a continuous 8 metres easement measured from either side of the culvert wall to ensure essential maintenance and emergency access to the watercourse are properly provisioned. We would also welcome any proposals which offer further benefit such as daylighting of the watercourse.

Further to the above, we would also highlight from satellite imagery reviewed that the proposed development appear appears to have been subject previous built development which could represent a risk of pollution to controlled waters (close proximity to watercourse receptor / situated upon a Secondary A Aquifer). To address this matter, we recommend that you refer to our published 'Guiding Principles for Land Contamination' which outlines the approach which should be adopted when managing this site's risks to the water environment.

To ensure proper model procedures and good practice, we recommend that developers should:

- Follow the risk management framework provided in CLR11, Model Procedures for the Management of Land Contamination, when dealing with land affected by contamination
- Refer to our Guiding principles for land contamination for the type of information that we require in order to assess risks to controlled waters from the site - the local authority can advise on risk to other receptors, such as human health
- Consider using the National Quality Mark Scheme for Land Contamination Management which involves the use of competent persons to ensure that land contamination risks are appropriately managed

Cont/d..

- Refer to the contaminated land pages on gov.uk for more information

Waste Material – Advice to Applicant / Developer

Waste on-site

The CL:AIRE Definition of Waste: Development Industry Code of Practice (version 2) provides operators with a framework for determining whether or not excavated material arising from site during remediation and/or land development works is waste or has ceased to be waste. Under the Code of Practice:

- excavated materials that are recovered via a treatment operation can be reused on-site providing they are treated to a standard such that they are fit for purpose and unlikely to cause pollution
- treated materials can be transferred between sites as part of a hub and cluster project
- some naturally occurring clean material can be transferred directly between sites

Developers should ensure that all contaminated materials are adequately characterised both chemically and physically, and that the permitting status of any proposed on-site operations are clear. If in doubt, the Environment Agency should be contacted for advice at an early stage to avoid any delays. We recommend that developers should refer to:

- the position statement on the Definition of Waste: Development Industry Code of Practice
- The waste management page on GOV.UK

Waste to be taken off-site

Contaminated soil that is (or must be) disposed of is waste. Therefore, its handling, transport, treatment and disposal are subject to waste management legislation, which includes:

- Duty of Care Regulations 1991
- Hazardous Waste (England and Wales) Regulations 2005
- Environmental Permitting (England and Wales) Regulations 2016
- The Waste (England and Wales) Regulations 2011

Developers should ensure that all contaminated materials are adequately characterised both chemically and physically in line with British Standard BS EN 14899:2005 'Characterization of Waste - Sampling of Waste Materials - Framework for the Preparation and Application of a Sampling Plan' and that the permitting status of any proposed treatment or disposal activity is clear. If in doubt, the Environment Agency should be contacted for advice at an early stage to avoid any delays.

If the total quantity of hazardous waste material produced or taken off-site is 500kg or greater in any 12 month period, the developer will need to register with us as a hazardous waste producer. Refer to the hazardous waste pages on GOV.UK for more information.

Cont/d..

Environmental Permit / Flood Risk Activity Permit

This development may require a permit under the Environmental Permitting (England and Wales) Regulations 2016 from the Environment Agency for any proposed works or structures, in, under, over or within eight metres from either side of the culvert of Moston Brook, designated a 'main river'. This was formerly called a Flood Defence Consent. Some activities are also now excluded or exempt. A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits.

The Environment Agency has discretionary powers to carry out maintenance works on the channels of "main river" watercourses to remove blockages and ensure the free flow of water. Information on riparian landowner's rights and responsibilities can be found at https://www.gov.uk/guidance/owning-a-watercourse

EA Charge Agreement Service

Should you wish us to review any technical documents or want further advice to *address the environmental issues raised,* we may do this as part of our charged for planning advice service.

Further engagement will provide you with *the opportunity to discuss and gain our views on potential options before formally submitting further information as part of your planning application.* It should also result in a better quality and more environmentally sensitive development.

As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. The standard terms of our charged for service are available here.

If you would like more information on our planning advice service or should you have any queries regarding this letter, then please do not hesitate to contact me.

Yours sincerely

Mr Andy Davies
Sustainable Places Advisor

Direct dial 02077140640
Direct e-mail andy.davies1@environment-agency.gov.uk

End

Civic Engineers Ltd
Carvers Warehouse 77 Dale Street
Manchester
Manchester
M1 2HG

Our ref: SO/2020/120194/01-L01
Your ref: 1226-01

Date: 07 May 2020

FAO: Paul Morris

Dear Mr Morris

ENVPAC/1/GMC/00244 - NORTHERN GATEWAY DEVELOPMENT - TELECONFERENCE 23.04.20- RESIDENTIAL DEVELOPMENT - COLLYHURST MANCHESTER

NEEDWOOD CL, MANCHESTER M40 8JN

Thank you for meeting with the Environment Agency via Microsoft Teams on 23rd of April 2020 in order to discuss environmental constraints relating to land at Collyhurst , Manchester, part of the wider Northern Gateway redevelopment.

Please note that in attending this meeting and providing this response, we have used 4 hours of charge agreement ENVPAC/1/GMC/00244 (4 hours remaining).

As a follow on to our meeting discussions, please see outlined below a brief recount of proceedings.

Environment Agency Meeting Summary

Victoria Hunter (Far East Consortium, FEC) provided attendees with an overview of the proposed development in question and its siting within the wider context of the Northern Gateway redevelopment.

Further to this, Andy Davies (EA) explained previous engagement with Civic Engineers regarding the proposal via former Civic Engineers staff member Peter Collier, noting interest in understanding how the proposed development would interact with the main river culverted under the site and a preference to avoid construction which could hinder future maintenance and improvements of the watercourse in the subsequent future. Previous consultation on the wider Northern Gateway has also been undertaken with FEC via EA colleagues Helen Telfer (planning specialist) not present and Gary Morris (biodiversity officer) who was in attendance.

Paul Morris (Civic) explained that current position of the culverted watercourse was roughly known and further to this, surveys were to be commissioned to better understand its positioning and the current condition of the culvert pipe.

At present it is believed that the overall culverted extent is varying in depth but is approximately 22-25 metres deep for the northern “dog-leg” culvert and 13 metres deep at the southern boundary. It was explained by EA delegates that although the main river is registered as an EA interest in terms of culvert maintenance and repair responsibility was held by the riparian owner (usually the person who owns the land or property but may also be the tenant depending upon the agreement in place).

As part of the commissioned surveys and information gathering, the EA are keen to understand the history of the culverts that pass beneath the site, when, how and why they were constructed etc. and any information or knowledge that could be shared to inform the subsequent EA determination. With regards to this, Sandrine Thomas (EA) noted that the main issue to address is access and maintenance, given if there was the possibility of a total or partial collapse of the culvert. As current indicative proposals suggest development within the 8 metres river easement, there is potential a risk of a collapse event occurring without suitable consideration and build design.

Charles (Civic) reiterated that they will request for a structural survey to be undertaken to establish the line of the culvert and will also explore any recommendations to potentially extend the culvert design life mitigating collapse. With regards to building over the culvert Charles explained that it's successfully achieved in other similar instances and that the lessons learned from this can be drawn upon. However, further to this the EA advises consideration into revising the layout, if feasible, to avoid building over the culvert reducing risk of collapse.

In the instance that development will fall within the 8m easement (to be confirmed subject to further survey and design refinement), Sandrine agreed she would consult with the EA's Asset Performance team to identify Agency requirements and provide notification to the developer/ agent / Civic Engineers. For any proposal, regardless of easement, it will be important to ensure that no additional loading is placed on the culvert and that adequate access is provided for any future replacement/repairs.

With regards to site drainage, Civic Engineers note that they will discuss with Manchester Lead Local Flood Authority their proposed surface water drainage management and also via FEC explore the opportunity for adoption of SUDs with United Utilities.

Gary Morris (EA, FBG), spoke about our concerns about the potential loss of existing greenspace. I response, Victoria (FEC) further explained the wider redevelopment proposals of the Northern Gateway site in Collyhurst area in particular the creation of new public open greenspace directly to the south of proposed new residential scheme. Further to this, FBG recommended that the schemes planned wider environmental package of works be specified in any future planning submission, to show how loss of existing greenspace is being mitigated. FBG also welcomed scheme's aspirations to be a SUDS exemplar.

Andy (EA) noted that given the site's locale there was the potential for historical sources of contamination. Given the present of a vulnerable receptor on site, it will be important as part of further investigations to fully understand the site characteristics and possibility of contamination source pathways to Moston Brook and wider River Irk waterbody.

--

Further to the above recount, we look forward to receiving notification of the outcomes of further site investigations to be undertaken and if requested, the facilitation of any further discussion or review under charge agreement ENVPAC/1/GMC/00244.

If needed an extension to ENVPAC/1/GMC/00244 can be arranged to encompass further EA work.

Should you have any queries regarding this response, then please do not hesitate to

contact me.

Yours sincerely

Mr Andy Davies
Sustainable Places Advisor

Direct dial 02077140640
Direct e-mail andy.davies1@environment-agency.gov.uk

End

Andrea McGee

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 19 October 2020 16:01
To: Andrea McGee
Cc: Wastewater Developer Services
Subject: RE: 1226-01 UU PDE - Rochdale Road M40 7XH - UU Ref 4200034144

Good Afternoon Andrea,

Pre Development Enquiry for: Rochdale Road M40 7XH UU Reference Number : 4200034144

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 375mm diameter public foul water sewer within Thornton Street North located to the East of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website: https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the culverted watercourse located within Thornton Street North of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Sewer Adoptions

You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/

A free copy of the new Design & Construction Guidance can be downloaded via the link below:

https://www.water.org.uk/wp-content/uploads/2020/03/SSG-App-C-Des-Con-Guide-v-2-100320-C.pdf

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:
https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

United Utilities
Water for the North West

Matthew Dodd
Developer Engineer
Developer Services & Metering
Customer Services
T: 07468 758244
unitedutilities.com

If you have received a great service today why not tell us?
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---

From: Andrea McGee [mailto:andrea.mcgee@civicengineers.com]
Sent: 07 October 2020 15:11
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: 1226-01 UU PDE

Good Morning/Afternoon,

We are currently in the process of developing a drainage strategy for the above sites at Collyhurst, Manchester. The proposed sites are located of Rochdale Road;

- Collyhurst Village: approximate post code is: M40 7XH and the approximate National Grid Reference is: 385601,400519.
- South Collysurst: approximate post code is: M40 7QH and the approximate National Grid Reference is: 385479,399754.

The proposed development is to comprise of up to:
Collyhurst Village : 300 residential properties – approximate site area - 4.2ha
South Collyhurst: 36 residential properties – approximate site area - 0.5ha

Both development boundaries are located within Flood zone 1. Neither a sequential exception testing is considered necessary for this development.

Please see link to initial drainage considerations for the discharge of surface water for the proposed developments.

https://we.tl/t-5xNyzTLYHK

The design is still currenting a WIP and so is subject to some minor alterations as the design progresses.

The entire site is located in Flood zone 1.

Infiltration
Due to the historic nature of the site , infiltration is not considered feasible as there are a number of potential contamination sources across the sites remnant from the previous developments include asbestos, metals and hydrocarbons. Site geology is mapped as Till over Pennine Coal Measure in the north and central parts of the site. Investigation included in link.

Surface water body
The River Irk is approximately 240m west of the site. Moston Brook is culverted beneath Thornton St .

Our Drainage proposals are to collect surface water through conventional piped system that utilises a Suds features within the site and a Pond to the south of the site as a form of attenuation storage. It appears that the existing UU network discharges in to the culver. Therefore we proposed drain to the park, attenuate, discharge to the UU sewer which then discharges into the culvert. This culvert then discharges to the River Irk.

The site has been divided into 4 Catchments, A, B,C,D. We Propose to discharge Surface water at Brownfield rates, incorporating a 50% betterment.
Catchment A: Brownfield rate - 17.4l/s_ Collyhurst Village
Catchment B: Greenfield rate - 5.1/s_ Collyhurst Village
Catchment C: Brownfield rate - 17.6l/s_ Collyhurst Village
Catchment D: Brownfield rate – 22.5l/s_ Collyhurst Village
Catchment E: Brownfield rate – 15 l/s _South Collyhurst

Can UU confirm preferred point of connections and that proposed discharge rates are acceptable.

It is proposed to discharge foul and surface water into the existing UU network located within:

- Thornton St for Collyhurst Village development.
- Winscombe Drive South Collyhurst development

Can you confirm that UU will accept foul and surface water discharge into the existing network located with Thornton Street and Winscombe Drive, Whitley Road?

If you require anything further from me please do not hesitate to let me know.

Kind regards

AndreaMcGee
Civil Design Engineer

Tel:0161 228 6757

Civic Engineers

Manchester / London / Leeds / Glasgow

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Andrea McGee

From: Ryan Horngren
Sent: 02 November 2020 15:14
To: oliver.timmins@manchester.gov.uk
Cc: Paul Morris; Andrea McGee
Subject: 1226-01 LLFA PDE
Attachments: 1994-EXA-00-GF-DR-L-100.pdf; 1226-01-CIV-XX-VIL-DR-D-0500 - Existing Drainage Catchments-North Collyhurst.pdf; 1226-01-CIV-XX-ZZ-SK-C-0004-P02 - DRAINAGE STRATEGY_ATTENUATION WITHIN PARK.pdf

Hi Oliver,

Thank you for your response below in connection to the proposed residential development to Collyhurst.

Additional info for download

We would like to respond to your points raised and discuss further in aid of an agreeable drainage solution. We are looking to include as much SuDS features as we can to make this an exemplar development with in Greater Manchester. We have approached UU and MCC highways to discuss the adoption of such features with the below strategy developing from these discussions.

As the highways are being put forward for adoption we are exploring alternatives to permeable paving that allow for greener drainage pathways. As a result we would be looking to drain dwellings and highways through raingardens and treepits strategically placed to intercept the surface water. Once collected, the water will be piped at sub-base level and conveyed to the adjacent proposed park where it will be discharged into a swale and/or attenuation pond. From here the attenuated surface water will be discharged at an agreed rate to the surface water sewers adjacent to the park.

The following drainage hierarchy is being followed:

- Infiltration – not possible (infiltration tests failed with deep existing made ground being observed on site) see attached ground investigation report
- Water body – no open water body near by with in an acceptable distance for discharge
- Surface water sewer – existing surface water sewer adjacent to the development proposed for discharge. Discussions with UU positive.

With the shear size of the development and proposed park space we would like to discuss agreeing a discharge rate that is made up of greenfield rates and a 50% betterment on brownfield rates, portioned out according to the attached existing catchment drawing. We would like to ask that catchment A, C and D are agreed to discharge at a 50% betterment on the brownfield rate with catchment B discharging at the greenfield rate. As you will see there is considerable existing impermeable surfacing on catchments A, C and D, with surveyed existing surface water sewers present. The existing buildings contained onsite have been demolished making way for future development.

The following rates are put forward for consideration:
atchment A – 17.4 l/s
Catchment B – 5.1 l/s
Catchment C - 17.6 l/s
Catchment D – 22.5 l/s

We believe the proposed raingardens and treepits, where water will be collected, through out the proposed development will allow at source attenuation slowing down the surface water time of concentration before collecting with in the attenuation pond. The end of system attenuation pond will provide further amenity and biodiversity with a permanent water body proposed. The proposed park will be providing further green space to the community.

To accommodate the permanent water body we ask the discharge rates above are agreed to as the time of concentration will be longer for the proposed system, leading to delay of surface water entering the existing infrastructure.

We have a meeting with MCC this Thursday to discuss the development and in specific the drainage, however it might be beneficial for us to have a discussion prior to this if you are available? If you have time let me know and I'll make myself available to discuss further.

In the meantime, if you require any further information please let me know.

Regards,
Ryan

From: oliver.timmins@manchester.gov.uk <oliver.timmins@manchester.gov.uk> on behalf of floodriskmanagement@manchester.gov.uk <floodriskmanagement@manchester.gov.uk>
Sent: 22 October 2020 12:45
To: Andrea McGee <andrea.mcgee@civicengineers.com>
Subject: Re: 1226-01 LLFA PDE

Hi Andrea,

Thanks for your enquiry. See below my response.

Points of Discharge:

Although some level of contamination on site has been mentioned in the 'Preliminary Risk Assessment', we would require that a Site Investigation is carried out on both sites to identify the specific levels of pollution and then how this relates to the potential for draining areas of the site via infiltration. In accordance with the drainage hierarchy we would require that soakaway tests are carried out on site to BRE 365 standard before any other points of discharge are agreed.

Note: Our records show a culverted main river (Moston Brook) to run through the centre of the Collyhurst Village site, any works involving/within close proximity to this culvert will require discussions with the EA.

Discharge rates:

Both of the existing sites are green areas with a substantial amount of green vegetation and which are frequently used by the public for recreational activities. Therefore, we would require that all discharge rates are restricted to greenfield run-off rates to mimic that of the existing site and to create a drainage betterment. In addition, as both of the sites are existing green areas we would require that the use of green SuDS on site are maximised to compensate for the removal of the existing green space.

Historic Flood Records:

Our records do not show any previous records of flooding on either of the sites.

If you require any further discussions regarding this site then let me know.

Kind Regards,

Oliver

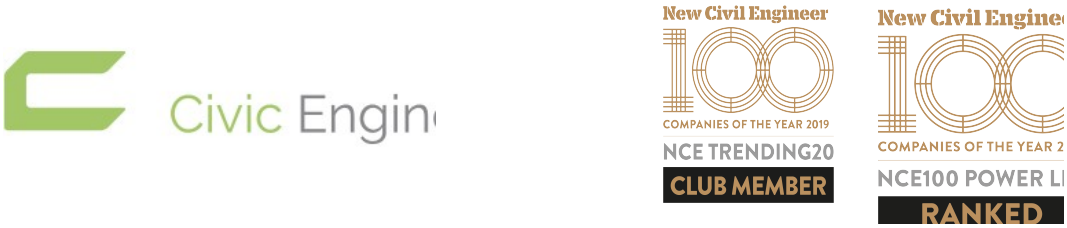
Flood Risk Management
Highways Service, Growth and Neighbourhoods Directorate
Manchester City Council
Tel: 0161 219 6295
Email: floodriskmanagement@manchester.gov.uk

Web: http://www.manchester.gov.uk/

POSTAL ADDRESS: Manchester City Council, Public Realm, The Neighbourhood Service, PO Box 532, Town Hall, Manchester M60 2LA

Ryan Horngren
Civil Design Engineer

Tel: 0161 228 6757
DDI:0161 470 7703



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From: Andrea McGee <andrea.mcgee@civicengineers.com>
To: "floodriskmanagement@manchester.gov.uk" <floodriskmanagement@manchester.gov.uk>,
Date: 07/10/2020 15:13
Subject: 1226-01 LLFA PDE

FAO Lead Local Flood Authority.

Good Afternoon.

We are currently in the process of developing a drainage strategy for the above site at Collyhurst, Manchester.
The proposed sites are located of Rochdale Road;

- Collyhurst Village: approximate post code is: M40 7XH and the approximate National Grid Reference is: 385601,400519.
- South Collysurst: approximate post code is: M40 7QH and the approximate National Grid Reference is: 385479,399754.

The proposed development is to comprise of up to:
Collyhurst Village : 300 residential properties – approximate site area - 4.2ha
South Collyhurst: 36 residential properties – approximate site area - 0.5ha

Both development boundaries are located within Flood zone 1. Neither a sequential exception testing is considered necessary for this development.

Please see link to initial drainage considerations for the discharge of surface water for the proposed developments.

https://we.tl/t-15tX0WYuLu

The design is still currenting a WIP and so is subject to some minor alterations as the design progresses.

The entire site is located in Flood zone 1.

Infiltration
Due to the historic nature of the site , infiltration is not considered feasible as there are a number of potential contamination sources across the sites remnant from the previous developments include asbestos, metals and hydrocarbons. Site geology is mapped as Till over Pennine Coal Measure in the north and central parts of the site. Investigation included in link.

Surface water body
The River Irk is approximately 240m west of the site. Moston Brook is culverted beneath Thornton St .

Our Drainage proposals are to collect surface water through conventional piped system that utilises a Suds features within the site and a Pond to the south of the site as a form of attenuation storage. It appears that the existing UU network discharges in to the culver. Therefore we proposed drain to the park, attenuate, discharge to the UU sewer which then discharges into the culvert. This culvert then discharges to the River Irk.

The site has been divided into 4 Catchments, A, B,C,D. We Propose to discharge Surface water at Brownfield rates, incorporating a 50% betterment.
Catchment A: Brownfield rate - 17.4l/s_ Collyhurst Village
Catchment B: Greenfield rate - 5.1/s_ Collyhurst Village
Catchment C: Brownfield rate - 17.6l/s_ Collyhurst Village
Catchment D: Brownfield rate – 22.5l/s_ Collyhurst Village
Catchment E: Brownfield rate – 15 l/s _South Collyhurst

Can you advise if there was any historic flooding in this area?

Can you confirm what Manchester City Council's LLFA require from us as part of submission of our FRA and Drainage strategy for successful application.

If you require anything further from me please do not hesitate to let me know.

Kind regards

Andrea McGee
Civil Design Engineer
Tel: 0161 228 6757
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Andrea McGee

From: Andrea McGee
Sent: 07 December 2020 12:50
To: Andrea McGee
Subject: FW: 1226-01 - Collyhurst Village Site - Pre-Planning Drainage Strategy Review - Meeting Notes
Attachments: 1226-01-CIV-VIL-DR-EX-C-0205-P02 - Existing_Culverts_WIP.pdf; 1226-01-CIV-XX-VIL-DR-D-0500 - Existing Drainage Catchments-North Collyhurst.pdf; 1226-01-CIV-XX-VIL-DR-D-0504 - P04 - Proposed Drainage Strategy_WIP.pdf; 1226-01-CIV-XX-VIL-DR-HI-0350 - Typical Highway Section.pdf

Andrea McGee
Civil Design Engineer

Tel: 0161 228 6757

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From: Paul Morris <paul@civicengineers.com>
Sent: 15 November 2020 14:30
To: Neil Bayliss-Rowe <neil.bayliss-rowe@manchester.gov.uk>; Keith Garner <keith.garner@manchester.gov.uk>; Bernard Murtagh <bernard.murtagh@manchester.gov.uk>; derek.mccormack@manchester.gov.uk; floodriskmanagement@manchester.gov.uk; Tucker, Sophie <Sophie.Tucker@uuplc.co.uk>; McDermott, Daniel <Daniel.McDermott@uuplc.co.uk>; Victoria Hunter <victoria.hunter@fecil.uk>; Jonathan Miley <jonathan.miley@exteriorarchitecture.com>; Jonathan.Wilks@avisonyoung.com; Kevan, Richard (Avison Young - UK) <Richard.Kevan@avisonyoung.com>
Cc: Ryan Horngren <ryan@civicengineers.com>; Chris Kendrick <chris.kendrick@civicengineers.com>
Subject: 1226-01 - Collyhurst Village Site - Pre-Planning Drainage Strategy Review - Meeting Notes

Hi all,

Further to our meeting on Thursday 5th November last week please find our meeting notes as follows:

MCC – Bernard Murtagh, Keith Garner
MCC Highways and Flood Risk - Neil Bayliss-Rowe, Oliver Timmins, Laura Peacock
UU – Sophie Tucker, Daniel McDermott

FEC – Victoria Hunter
Avison Young – Jonathan Wilks
Exterior Architecture – Jonathan Miley
Civic Engineers – Paul Morris, Ryan Horngren

1. Civic Engineers presented the site context, development proposals and site constraints including the presence of culverts beneath the site.
2. Civic Engineers presented the site wide drainage strategy. Generally the principle is to drain plot B,C and D through source control measures before discharge to an attenuation pond in the northern portion of the park. The pond will have a permanent water body adding to the amenity in the area with the attenuation volume required being provided above this. Plot A will be drained through source control measures before being attenuated further in oversized pipes or similar and discharged to the existing public sewer at a 50% betterment on the existing brownfield rate. UU and MCC Highways and Flood Risk require evidence of the existing points of connection and onward connection to the culverted watercourse (**CE Action**)
3. Civic Engineers explain the proposed discharge rate has been calculated based on greenfield run off rate from areas that are currently permeable and 50% reduction from areas that are currently hardstanding and positively drained. MCC Highways and Flood Risk advised that this was acceptable in principle subject to further review of the drawings and calculations.
4. MCC Highways and Flood Risk stated that they are supportive of the implementation of nature based SuDS and adoption as part of the Highway. Permeable paving is no longer shown within the areas proposed for adoption in line with previous correspondence. The principle of adoption of raingardens and SuDS tree pits was accepted subject to submission of further details around maintenance and management as previously requested.
5. The potential for a swale to be provided along the eastern edge of Thornton Street North was discussed. As this would likely only provide drainage function for the Highway it would not be adoptable by UU. MCC advised that they had not previously anticipated adoption of this feature but would discuss internally and advise.
6. MCC raised a query as to whether the attenuation in the Park could potentially be used to serve future phases of the development. The design team agreed to review but stated that this was unlikely due to the demands on space from current attenuation, play space and tree planting etc.
7. UU are supportive of the proposals and of the principle of adoption of the piped below ground drainage (conveying both highways and plot drainage) and the proposed attenuation basin subject to development of the details. UU stated their support for the provision of source control SuDS measures where practicable prior to surface water discharging to the below ground drainage network.
8. UU raised a comment on the location of the outfall from the pond as currently shown on the drawings. CE advised that this was indicative only and would be revised as the proposals developed to align with the recommendations as set out in the relevant guidance.
9. UU advised that any existing infrastructure abandonment and diversion applications should be submitted as soon as possible. All correspondence and applications should be marked for the attention of Daniel McDermott. UU request existing surveys to be sent through along with revised drainage proposals with rates and connections points to the existing adopted sewers. (**CE Action**)
10. Further discussion is required regarding the maintenance strategy for the park and the interface with the adoptable elements of the proposed pond.

If you have any comments at all or anything to add please let us know and we will update as necessary.

I have also attached the drawings that we presented at the meeting. These drawings are currently being developed ahead of the planning application and revisions will be submitted along with supporting information as previously discussed but we have attached at this stage to allow for any further review and comment ahead of the application.

Please don't hesitate to get in touch if you would like to discuss at all.

Thanks,

Paul

Paul Morris
Director

Mobile: 07793 868 265
Tel: 0161 228 6757

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APPENDIX D

Micro - Drainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	10.000	0.067	150.0	0.272	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	10.000	0.067	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.16	5.000	0.272	0.0	0.0	0.0	1.07	42.4	36.8
1.001	50.00	4.31	4.933	0.272	0.0	0.0	0.0	1.07	42.4	36.8

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.354
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%					5.179
1.001	2	15 Winter	1	+0%					5.112

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.046	0.000	0.99		34.8	OK	
1.001	2	-0.046	0.000	0.97		34.4	OK	

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	0.663	Urban	0.015
SAAR (mm)	864	Region Number	Region 10

Results l/s

QBAR Rural	3.7
QBAR Urban	3.8
Q2 years	3.6
Q1 year	3.3
Q30 years	6.4
Q100 years	7.9

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ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.470
Area (ha)	0.780	Urban	0.000
SAAR (mm)	922	Region Number	Region 10

Results l/s

QBAR Rural	5.2
QBAR Urban	5.2
Q1 year	4.5
Q1 year	4.5
Q30 years	8.8
Q100 years	10.8

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.354
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%					5.223
1.001	2	15 Winter	1	+0%					5.137

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.027	0.000	1.00		45.0	OK	
1.001	2	-0.046	0.000	1.00		44.9	OK	

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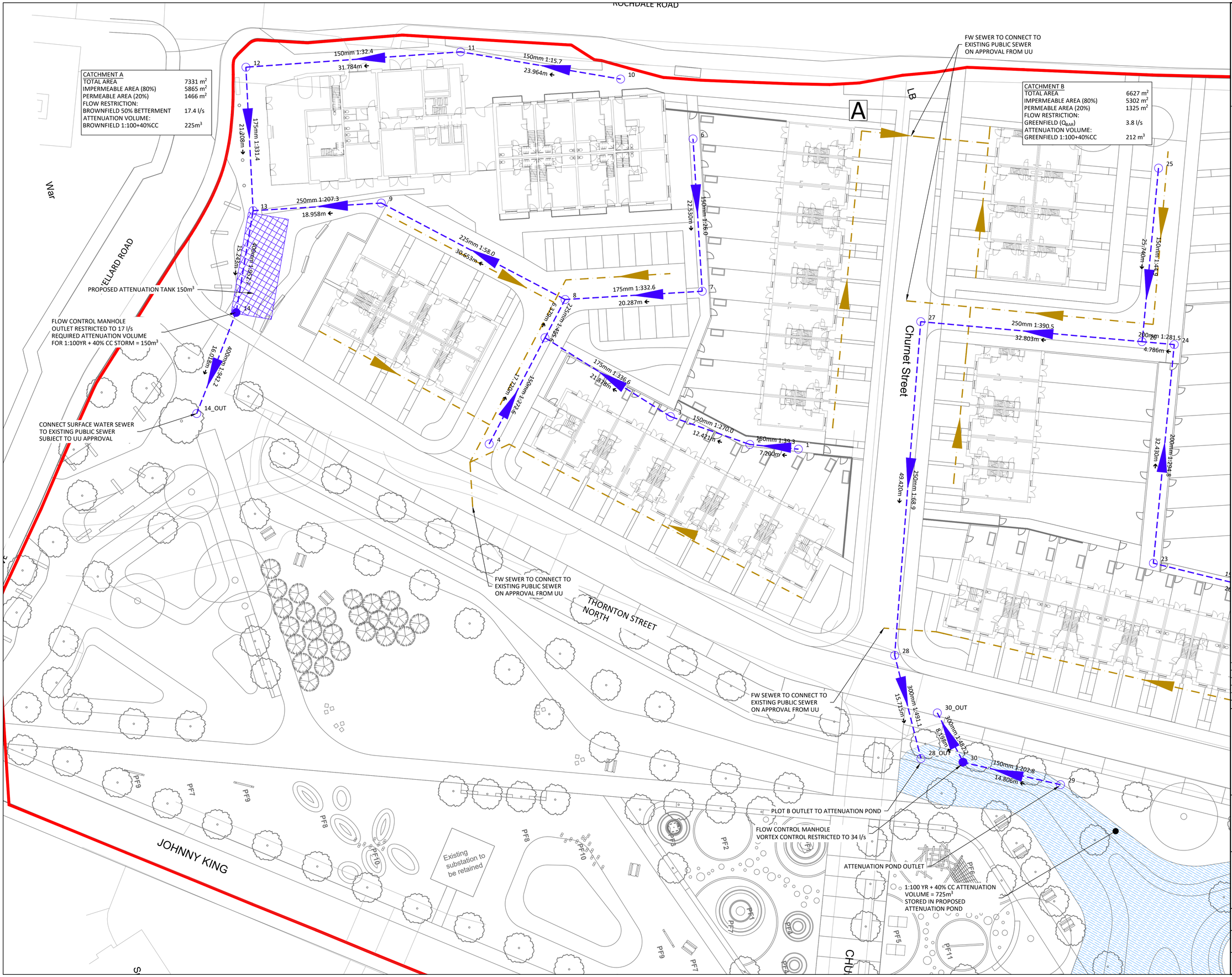
APPENDIX E
Proposed Drainage Strategy

Catchment Plans



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2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
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2. ALL FOUL WATER SEWERS TO BE 150mm DIAMETER PIPES UNLESS STATED OTHERWISE

PROPOSED SURFACE WATER SEWER
PROPOSED SURFACE WATER MANHOLE
PROPOSED FLOW CONTROL MANHOLE
PROPOSED FOUL WATER SEWER
INDICATIVE PROPOSED ATTENUATION POND

Date	Rev	Description	Drawn	Chkd
18.12.20	P05	ISSUED FOR PLANNING	AMG	PM
16.12.20	P04	ISSUED FOR PLANNING	RSH	PM
15.04.20	P03	CHANGE IN DISCHARGE POINT	RSH	PM
27.03.20	P02	STAGE 2 ISSUE	RSH	PM
31.01.20	P01	ISSUED FOR INFORMATION	RSH	PJC

Civic Engineers
MANCHESTER Carver's Warehouse, 77 Dale Street, Manchester, M1 2HG. Tel: 0161 228 6757
LONDON Reeds Wharf, 33 Mill Street, London SE1 2AX. Tel: 020 7253 2977
LEEDS Tower Works, Unit 02-01, Globe Road, Leeds, LS11 5QG. Tel: 0113 2025 130
GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829
www.civicengineers.com

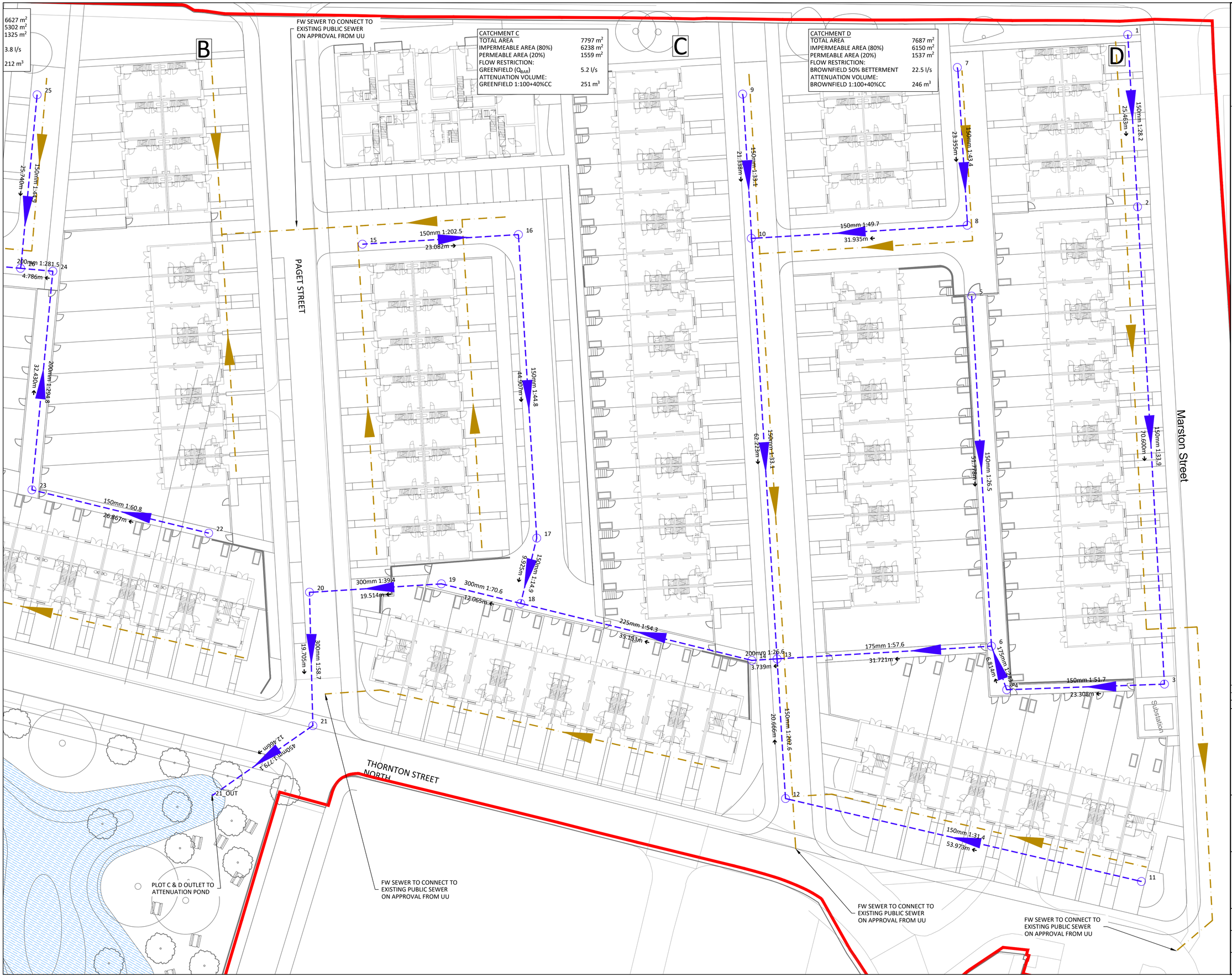
Project
COLLYHURST HOUSING
MANCHESTER

Title
COLLYHURST VILLAGE
PROPOSED DRAINAGE STRATEGY

Status
INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:500	17.01.20	RSH	PJC	--

Drawing Number: 1226-01-CIV-XX-VIL-DR-D-0504
Revision: P05



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2. ALL FOUL WATER SEWERS TO BE 150mm DIAMETER PIPES UNLESS STATED OTHERWISE

PROPOSED SURFACE WATER SEWER
PROPOSED SURFACE WATER MANHOLE
PROPOSED FLOW CONTROL MANHOLE
PROPOSED FOUL WATER SEWER
INDICATIVE PROPOSED ATTENUATION POND

Date	Rev	Description	Drawn	Chkd
18.12.20	P02	ISSUED FOR PLANNING	AMG	RM
16.12.20	P01	ISSUED FOR PLANNING	RSH	PM

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Project
COLLYHURST HOUSING
MANCHESTER

Title
COLLYHURST VILLAGE
PROPOSED DRAINAGE STRATEGY

Status
INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:500	17.01.20	RSH	PM	--

Drawing Number	Revision
1226-01-CIV-XX-VIL-DR-D-0505	P02

CATCHMENT A	
TOTAL AREA	7331 m^2
IMPERMEABLE AREA (80%)	5865 m^2
PERMEABLE AREA (20%)	1466 m^2
FLOW RESTRICTION:	
BROWNFIELD 50% BETTERMENT	17.4 l/s
ATTENUATION VOLUME:	
BROWNFIELD 1:100+40%CC	225m^3

CATCHMENT B	
TOTAL AREA	6627 m^2
IMPERMEABLE AREA (80%)	5302 m^2
PERMEABLE AREA (20%)	1325 m^2
FLOW RESTRICTION:	
GREENFIELD (Q_{BAR})	3.8 l/s
ATTENUATION VOLUME:	
GREENFIELD 1:100+40%CC	212 m^3

CATCHMENT C	
TOTAL AREA	7797 m^2
IMPERMEABLE AREA (80%)	6238 m^2
PERMEABLE AREA (20%)	1559 m^2
FLOW RESTRICTION:	
GREENFIELD (Q_{BAR})	5.2 l/s
ATTENUATION VOLUME:	
GREENFIELD 1:100+40%CC	251 m^3

CATCHMENT D	
TOTAL AREA	7687 m^2
IMPERMEABLE AREA (80%)	6150 m^2
PERMEABLE AREA (20%)	1537 m^2
FLOW RESTRICTION:	
BROWNFIELD 50% BETTERMENT	22.5 l/s
ATTENUATION VOLUME:	
BROWNFIELD 1:100+40%CC	246 m^3

Standard Notes

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3. All dimensions are to be verified by the contractor on site.
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2. EXISTING SERVICES INFORMATION HAS BEEN TAKEN FROM ASSET MAPS AND ARE SHOWN INDICATIVELY. ASSET MAPS RECEIVED FROM BUTTRESS ARCHITECTS ON 03/12/19.
3. CATCHMENT CURRENTLY INCLUDES AREA OF ADOPTED HIGHWAY

EXISTING IMPERMEABLE AREA

EXISTING PERMEABLE AREA

EXTENTS OF CATCHMENTS

Date	Rev	Description	Drawn	Chkd
17.12.20	P02	UPDATED CATCHMENT INFORMATION	LGS	AM
31.01.20	P01	ISSUED FOR INFORMATION	RSH	PJC

Civic Engineers

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
EXISTING DRAINAGE CATCHMENTS

Status

INFORMATION

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Date
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Transport Assessment

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Civic Job No.	1226-02
Issued	December 2020
Revised	January 2021 – updated to include FEC comments.

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1. Introduction

1.1 Commission

Civic Engineers have been commissioned by Far East Consortium Ltd (FEC) to produce this Transport Assessment (TA) to accompany a planning application for a residential-led mixed-use development site in the Collyhurst area of Manchester, to the north east of the city centre.

1.2 Development Proposals

The development proposals contain the following:

- 244 Residential Units comprised of 76 apartments in two blocks and 168 houses;
- 262 sqm Commercial/communal space;
- 412 Secure, Covered Cycle Parking Spaces, 15 communal spaces in the park;
- 200 Car parking spaces; and,
- The reinstatement of Marston St in the north of the site.

100 of the units will be for social rent as requested by Manchester City Council, all 76 apartments and 24 of the houses will be for social rent.

1.3 Report Content

This report includes a review of the existing transport networks around the site and a summary of national and local transport planning policy. It goes on to describe the development in detail and assess the improvements to and impacts on walking, cycling and public transport networks in the area. The intention is to provide the necessary information to assist Manchester City Council (MCC), as the Local Planning Authority, in determining the application. The scope of this report has been agreed through pre-application discussions with MCC and TfGM (May 2019).

This TA is accompanied by a Travel Plan (TP), which is submitted as a separate document, and which will promote the use of sustainable forms of transport to residents at the proposed development.

2. Existing Site and Transport Context

2.1 Site Location

The proposed development is located within the Collyhurst area of Manchester which is approximately 2.4km northeast of the city centre and is part of Manchester City Council's Northern Gateway Redevelopment Masterplan. The site location is shown on Figure 1.

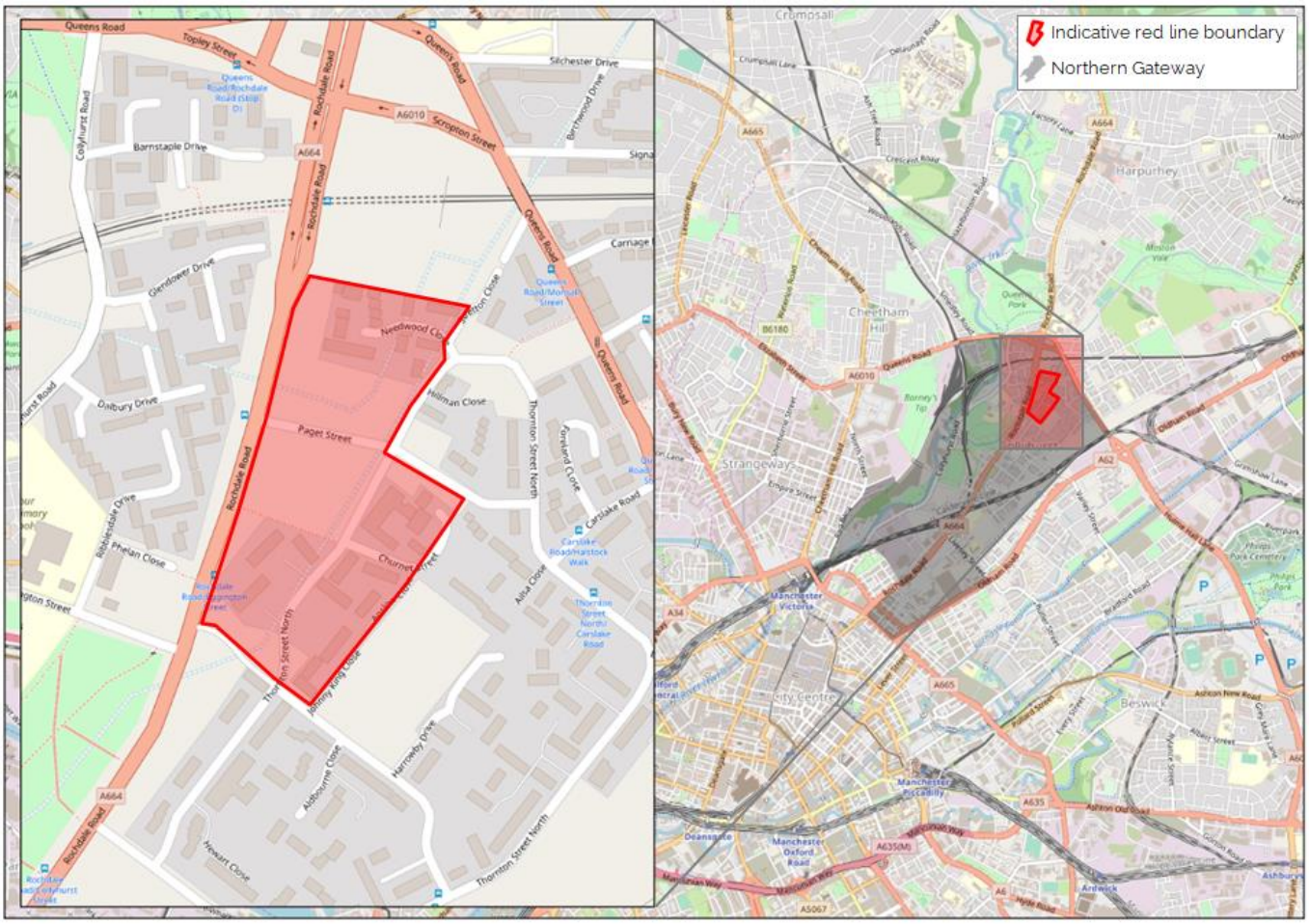

Figure 1: Site location

2.2 Existing Land Use

The site is to the northeast of Manchester city centre and approximately 4.2ha. It is bound by a wooded area and the East Didsbury to Rochdale tram line to the North, Thornton Street North and Anslow Close to the East, Shellard Road to the South and Rochdale Road to the West. The land was previously a housing development that has mostly been demolished, there is still a shop and some dwellings on the site and the rest of the land is now mostly scrub land with some streets and footpaths remaining. The surrounding area is predominantly residential.

2.3 Pedestrian Access

The site is accessible from all directions by pedestrians. Rochdale Road has 3-3.5m footways along either side with controlled crossing points at various points along its length. The nearest controlled crossing to the site is approximately 40m south of Paget Street, there is another 50m to the south of Shellard Street and another at the junction of Rochdale Road and the A6010 about 130m to the north of the site. Rochdale Road has streetlighting along its length and informal crossings with

dropped kerbs at junctions with side roads, some of which have tactile paving. The other streets in and around the site have 1.8m footways either side with dropped kerbs and tactile paving at the crossing points. The junction of Thornton Street North and Paget Street benefits from having a raised table meaning that there are no level changes at the crossing points, and it provides traffic calming measure at the same time.

To the east of the site there are a network of footpaths through the existing residential area. These provide access to Queens Road where there are controlled crossings for access to a convenience store and chemist as well as Monsall Street that leads to Monsall tram stop.

Some of the streets and footways have been resurfaced, where this is the case they are in good condition, in other places the footways are uneven and, in some places, overgrown.

The desirable, acceptable, and preferred maximum walking distances for commuting or trips associated with school are 500m, 1km and 2km, respectively[1]. Figure 2 shows these isodistances.

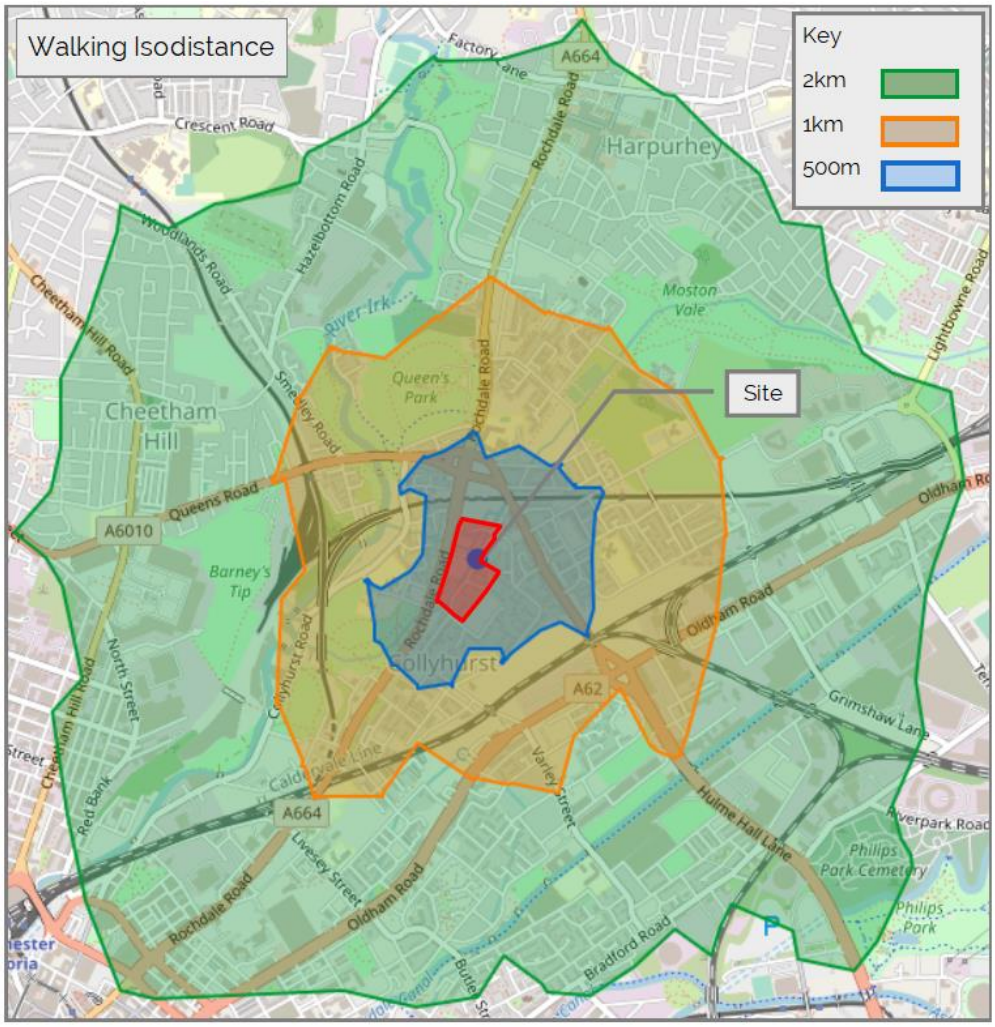

Figure 2: Walking isodistance

[1] Guidelines for Providing for Journeys on Foot, Institution of Highways and Transportation, 2000

A good provision of local amenities within a 20-minute walk is the subject of the aptly named '20-minute neighbourhood' movement[2]. The amenities within walking distance of the development indicate that many daily needs can be satisfied on foot, Figure 3 contains the education and healthcare services that are within 20-minutes of the development site. Also within this distance are parks and shops.

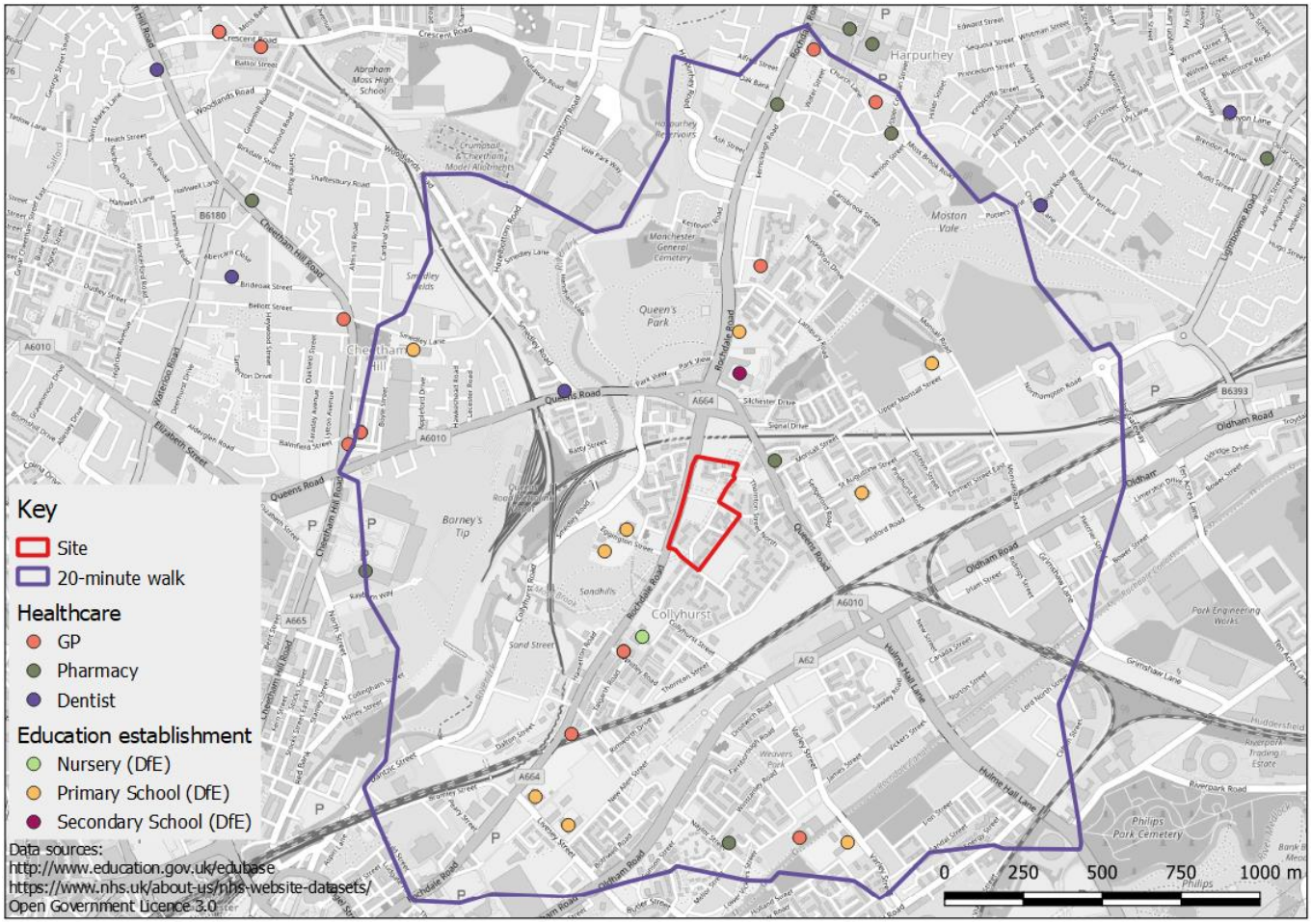

Figure 3: 20-minute neighbourhood

With an interlinked network of pedestrian routes in and around the site, it is concluded that the site is well located for access on foot.

2.4 Cycle Access

Figure 4 illustrates that there are a number of dedicated cycle facilities around the site including on-road routes along Rochdale Road shared with a bus lane in the northbound direction and only for a short distance southbound from the junction with the A6010.

[2] Z, P. (2015) The 20 Minute Neighbourhood. *The Culture Vulture.* [online] Available at: https://theculturevulture.co.uk/all/the-20-minute-neighbourhood/ (Accessed 14 October 2020)

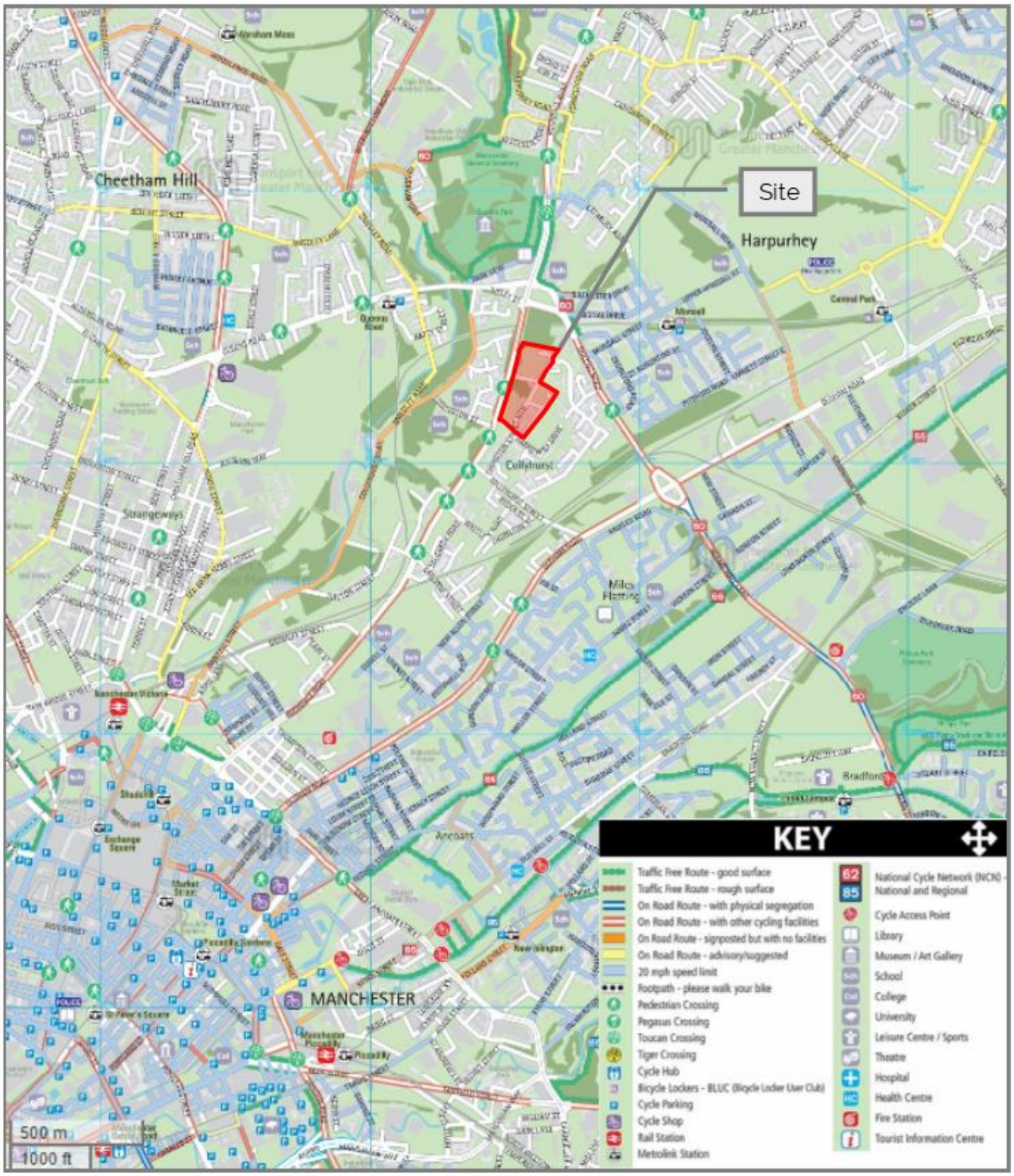

Figure 4: Extract from TfGM Cycle Route Map

Along Queens Road the cycle facilities are on road to the south of Carslake Road and shared with the pedestrian footway further north. These facilities form a section of the National Cycle Route (NCR) 60 which runs between Sale water park to the south west of Manchester city centre and Harpurhey just to the north of Collyhurst. Many of the streets within Collyhurst Village are subject to a 20mph speed limit, so although they do not have specific cycle infrastructure the traffic speed is low enough that a confident cyclist could use any of these streets to get around. To cycle to the city

centre there are incomplete cycle facilities along the length of Rochdale Road or there is a route along Collyhurst Road to the west that is signposted but with no facilities.

Transport for Greater Manchester (TfGM) are working to develop the 'Bee Network', a 1,800 mile network of walking and cycling routes that will connect neighbourhoods and give people within the communities a genuine choice about the way they make short journeys[3]. The Website: http://cycling.tfgm.com/ gives more information on upcoming events and cycling initiatives within Greater Manchester, including the Bee Network, which will see £160M invested in walking and cycling routes.

Proposed and confirmed infrastructure associated with the Bee Network near to the site are shown in Figure 5. They include a 'busy beeway' on Rochdale Road, 'beeways' on Shellard Road, Thornton Street North, Carslake Road, and Monsall Street. There are also proposed improvements to crossing points at the junctions on Queens Road with Monsall Street, Carslake Road, and Sedgeford Road as well as crossings on Rochdale Road at Shellard Street and Scropton Street[4].

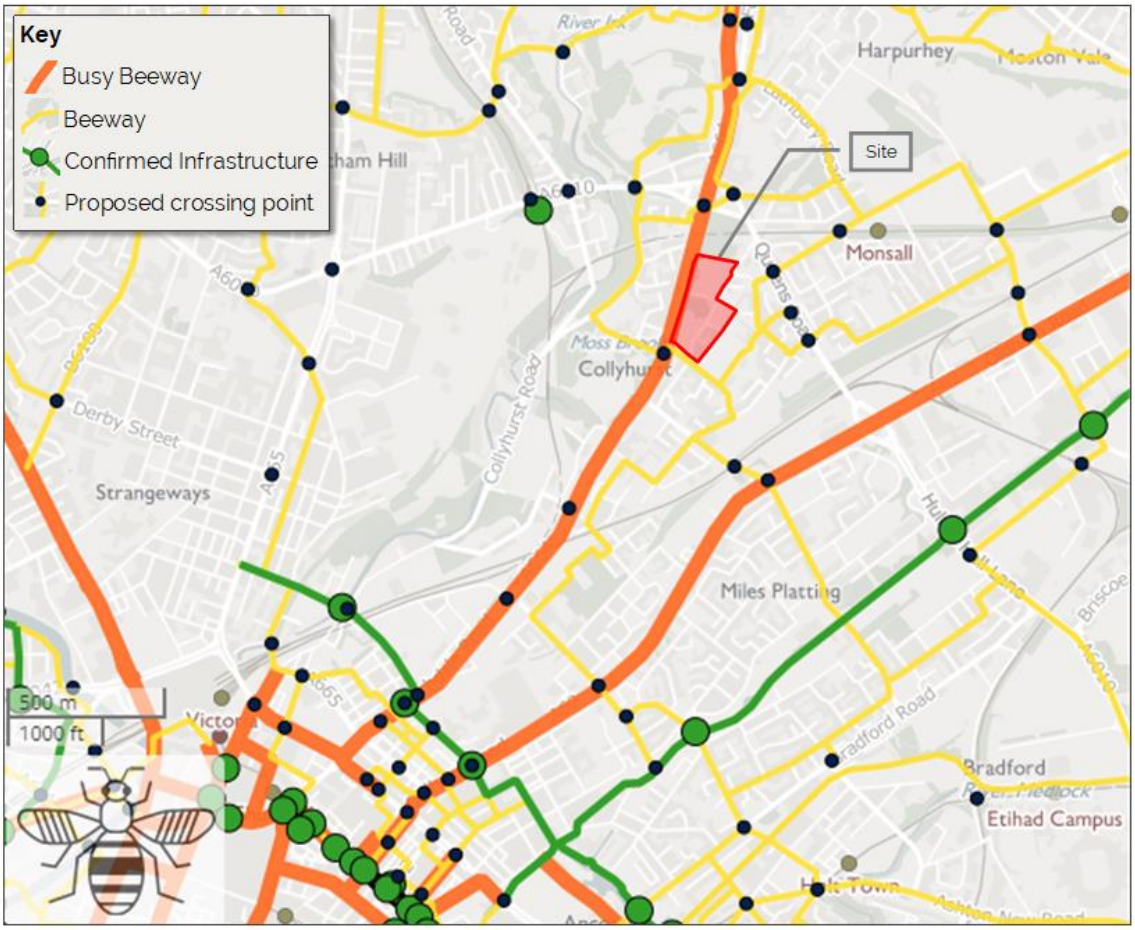

Figure 5: Bee network proposals

[3] Change a region to change a nation 2020. https://assets.ctfassets.net/nv7y93idf4jq/Xx5s7azQY1SYmdNKIAviX/e4395ab029410907365cd0962d17bf81/19-1950_Bee_Network_delivery_plan-style_-_website_version.pdf

[4] Bee Network Map https://mappinggm.org.uk/bee-network/ (accessed 6 October 2020)

Figure 4 illustrates a 30-minute cycle isochrone around the site, equivalent to approximately 8km. This indicates that people living at the development could reach all of Manchester City Centre, Salford, including Salford Quays as well as the University of Manchester and Manchester Royal Infirmary to the south of the city centre in a reasonable cycle commute to work or study.

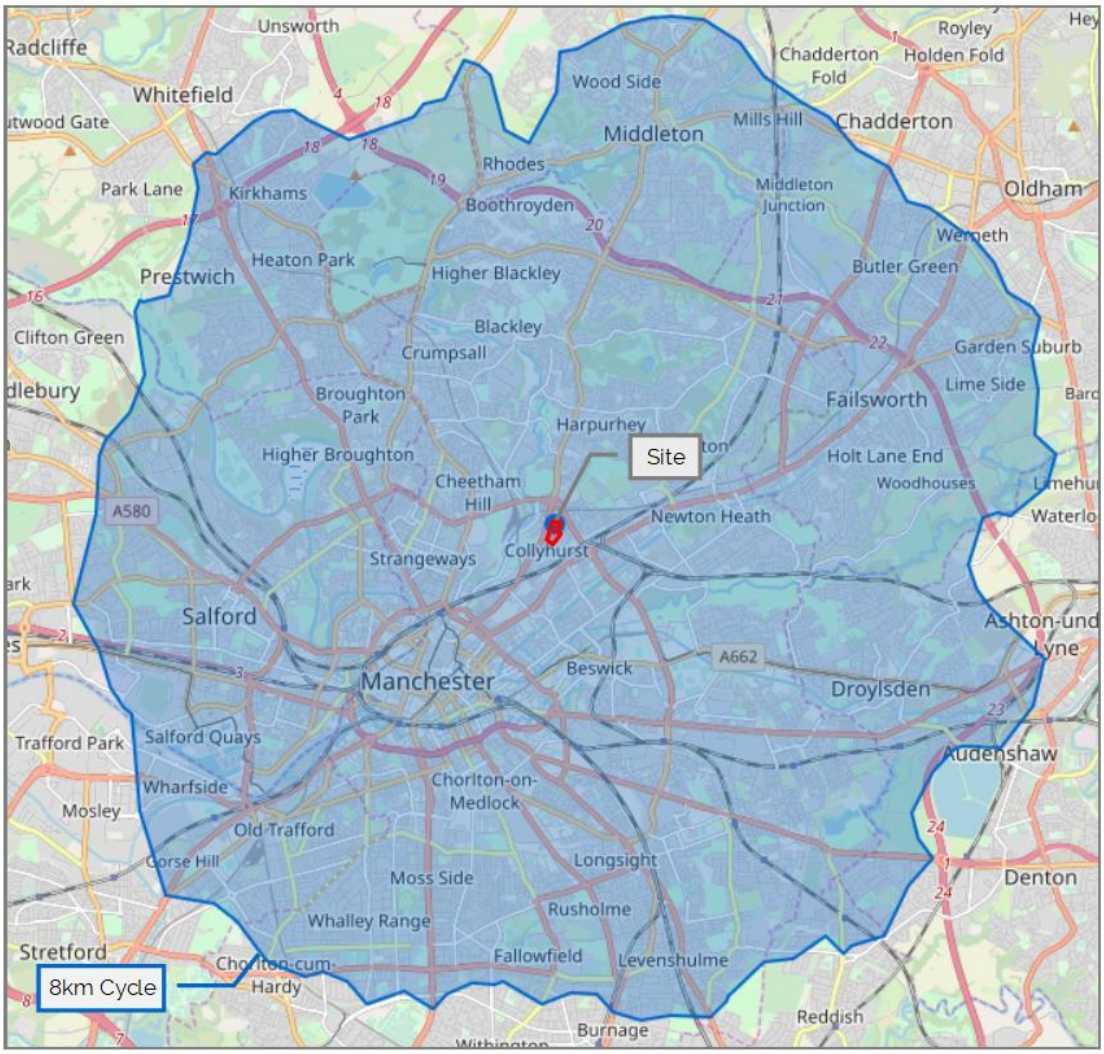

Figure 6: Cycling Isochrone

The site is well located for access by bicycle.

2.5 Greater Manchester Accessibility Level

The Greater Manchester Accessibility Level (GMAL) rates accessibility to public transport on a scale of 1 to 8, with 1 being the lowest level of accessibility and 8 being the highest. The site at Collyhurst is rated as 8 across the whole site. The following sections look at the public transport accessibility of the site in more detail.

2.6 Bus Access

Figure 5 shows the locations of the bus stops nearest the site.

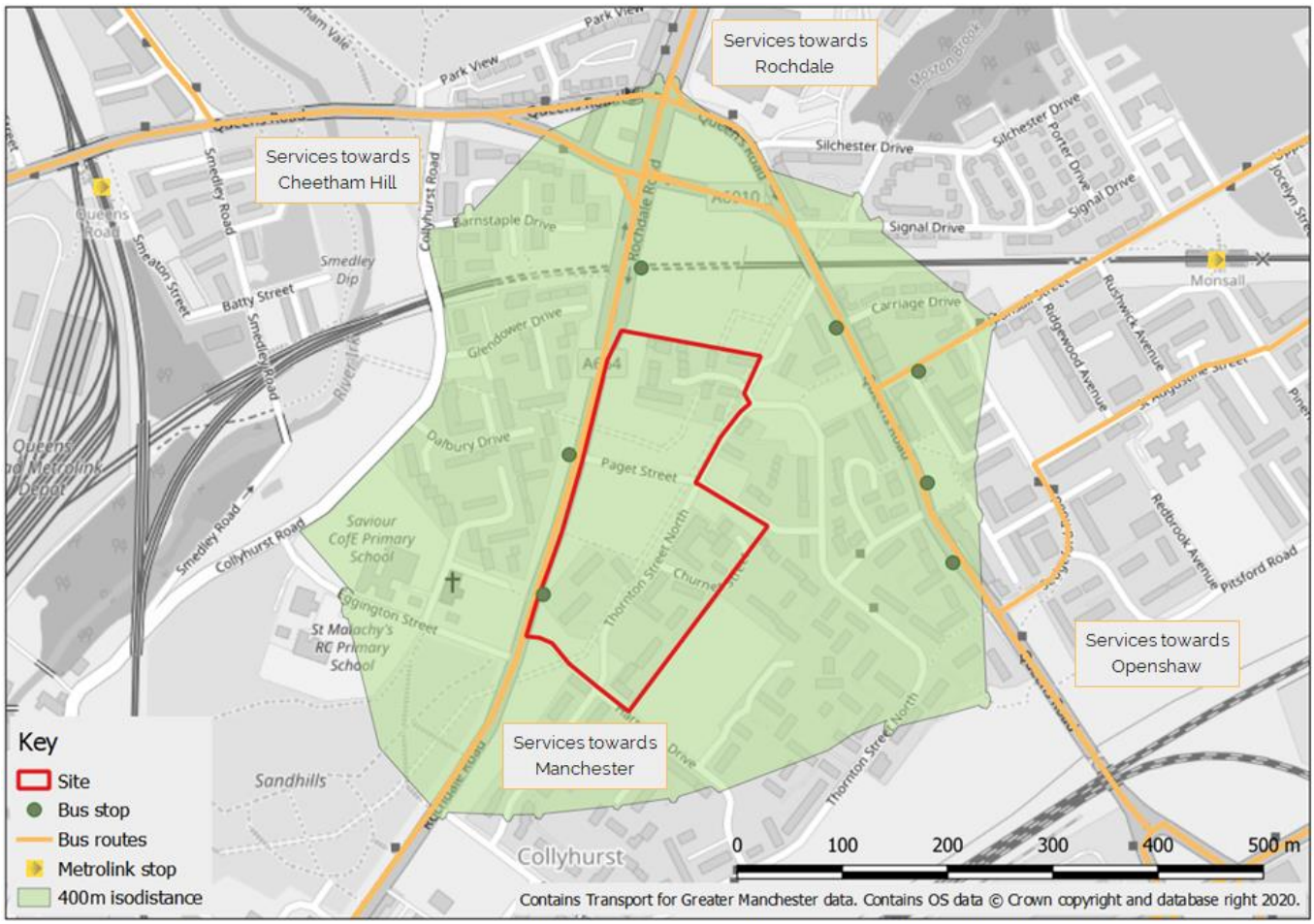

Figure 7: Public transport

Table 1 sets out a summary of the most regular services calling at the stops on Rochdale Road and Queens Road, with the services stopping on Rochdale Road in **bold**.

Table 1: Local bus services and their frequency

Service	Route	Frequency (minutes)			
		Monday - Saturday		Sunday	
		Daytime	Evening	Daytime	Evening
17	**Manchester - Collyhurst - Blackley - Middleton - Castleton - Rochdale**	**10**	**10**	**15**	**30**
18	**Langley — Middleton — Manchester — Manchester Royal Infirmary**	**10**	**10**	**15**	**30**
53	Cheetham Hill - Gorton - Rusholme - Old Trafford - Salford Quays - Pendelton	30	60	60	60
56	**Manchester - NMGH - Manchester circular**	**30**	**-**	**-**	**-**
81	**Manchester - Collyhurst - Moston - Werneth - Oldham - Derker**	**30**	**60**	**60**	**60**
112/113	**Middleton – Moston – Collyhurst – Piccadilly Gardens**	**15**	**20**	**30**	**30**
114	Manchester - Collyhurst - Moston - Alkrington - Boarshaw	20/30	60	60	60
117	**Greengate - Moston – Collyhurst – Piccadilly Gardens**	**30**	**-**	**60**	**-**
118	**Boarshaw - Moston – Collyhurst – Piccadilly Gardens**	**15**	**15**	**30**	**60**
119	**N. Manchester General Hospital – Moston – Piccadilly Gardens**	**30**	**30**	**60**	**60**
151	Hollinwood - Failsworth - Collyhurst - NMGH - Cheetham Hill - Mandley Park	60	-	-	-
156	**Middleton – Rhodes – N. Manchester General Hospital – Shudehill Interchange**	**30**	**30**	**60**	**60**
162/163	**Norden/Bury - Heywood – Middleton – Collyhurst - Piccadilly Gardens**	**10**	**20**	**15**	**60**

The information in Table 1 is correct at the time of writing (December 2020), however, many services are operating on temporary timetables in response to Covid-19 and as such may not be

representative of 'normal' operations. As such this information should be checked and updated when appropriate.

Table 1 and Figure 7 show that the site is well located to access bus services, with the nearest stops adjacent to the site on Rochdale Road. Approximately 32 services per hour travel along Rochdale Road, an additional five services per hour can be accessed from the stops on Queens Road. Some of the services that operate at a 10-minute frequency state that this is the minimum frequency during peak hours, therefore there are often more than six buses per hour for these services.

The stops on Rochdale Road have shelters and seating for passengers to use while waiting for the bus. There is no real-time-information at these stops, but they do have timetable information displayed. The northbound stop on Queens Road has a shelter, seating, and timetable information whereas the southbound stop has timetable information but no shelter or seating.

2.7 Metrolink

The closest Metrolink stop to the site is Monsall, which is located approximately 600m to the east of the site. Monsall is served by the pink Metrolink line, providing services between Rochdale and East Didsbury via the city centre, connections can be made at Victoria or Cornbrook for services covering the entire network. There are 15 spaces for cycle storage at this stop, five stands (10 cycles) and five lockers.

Another stop near to the site is Queens Road, approximately 700m from the northwest of the site. Queens Road is served by the yellow Metrolink line which offers services between Bury and Piccadilly. There are five cycle stands at this stop, enough to accommodate 10 cycles.

Services on all lines run 06:00-00:00 Monday to Saturday; from 06:00-19:00 Monday to Friday and 08:00-20:00 Saturday trams run at 10-minute intervals, at other times there is a 20-minute service. On Sunday, a 15-minute service runs from 07:00-23:00. Metrolink is currently (December 2020) operating a reduced service in response to the Covid-19 pandemic and these times should be reviewed when appropriate.

2.8 Rail

The nearest train station to the development is Manchester Victoria Station located approximately 2km (as the crow flies) to the southwest of the site. The station can be reached on foot in about 30 minutes, by bike in around 10 minutes, or by bus in about 15 minutes.

Manchester Victoria Station is the city's second largest mainline station and home to one of the nine Metrolink stops within the City Zone. The station hosts local and regional services to destinations such as Leeds, Newcastle, Liverpool, Rochdale and Huddersfield, operating across 6 platforms.

The station is staffed between the hours 0630 – 2200 Monday to Saturday and 0800 – 2215 on Sundays. The station benefits from both a ticket office and ticket machines with ticket barriers. Cycle storage is available within the station (38 cycle stands). Refreshment facilities and toilets are also available.

The site is approximately 2.5km (as the crow flies) from Manchester Piccadilly, 10 minutes by bike or about 25 minutes by public transport. The city's largest mainline station has regular services to national destinations such as London, Birmingham, Sheffield, Leeds and Glasgow, as well as frequent connections to Manchester Airport and many stations within the wider Manchester area.

2.9 Local Highway Network

Rochdale Road along the western boundary of the development is a strategic radial route into and out of Manchester city centre. The carriageway is three lanes wide adjacent to the site, one lane in each direction for general traffic and a northbound bus lane (7am-7pm 7-days a week). To the north it widens to six lanes at the junction with Queens Road to accommodate turning lanes and then is four lanes wide to the north of this junction. It has streetlights and a 30mph speed limit. It provides access to the M60 at junction 20 as well as passing through suburban north Manchester. Toward the city centre it provides a connection with the Manchester ring road which connects with all the radial routes around the city, one of which is the M602 leading to the M62 and M6.

Queens Road A6010, to the east of the site is a local strategic route through the north of Manchester. Queens Road connects with Oldham Road to the south and with Cheetham Hill Road to the west.

Roads in the area have a 30mph speed limit and many of the residential streets in the surrounding area have 20mph speed limits.

2.10 Car Parking

Car parking is provided for the residents in the surrounding area either in the form of parking courts near the houses or on-street parking. There are no parking restrictions in the area (except for at junctions),

2.11 Car Clubs

Enterprise operate a car club in Manchester, however, the nearest car club vehicle is around 2km from the site.

2.12 Road Safety

An analysis of collision data using the website www.crashmap.com has been undertaken. Data was examined for road traffic collisions in the vicinity of the site that took place in the 5-year period to 2019. The records in the database relate only to incident resulting in personal injury and those which are reported to the police. While very few if any fatal accidents do not become known to the police it is recognised that a considerable proportion of non-fatal injury accidents are not reported. Furthermore, damage only collisions with no human casualties are not recorded. All collisions that occurred in the outlined areas in Figure 8 are summarised in Table 2. The total number of incidents have been broken down by severity. In addition, the number of collisions involving pedestrians, cyclists or motorcyclists have been recorded.

Table 2: Road traffic collisions in vicinity of site

Location	Fatal	Serious	Slight	Pedestrian	Cycle	Motorcycle
A6010/Rochdale Road Junction	-	1	10	2	2	-
Rochdale Road	-	3	6	3	1	1
A6010 Queens Road	-	1	4	-	-	1

Location	Fatal	Serious	Slight	Pedestrian	Cycle	Motorcycle
Oldham Road	-	1	11	1	3	1
Total	-	6	31	6	6	3

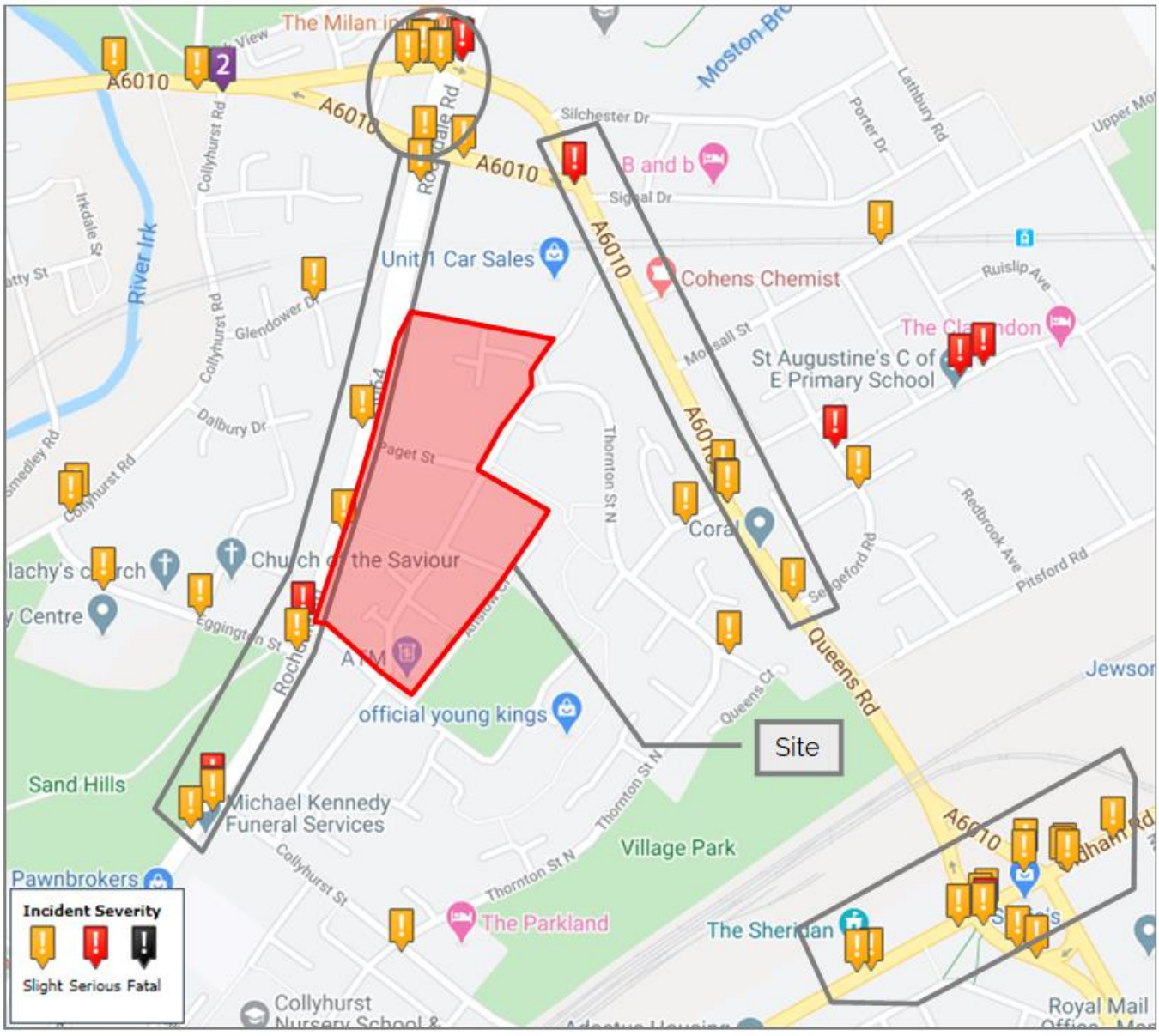

Figure 8: Collision Locations

There are two clusters of recorded collisions occurring at the junctions of Queens Road with Oldham Road and Queens Road with Rochdale Road. Most injuries arising from these collisions were slight in severity with a few collisions causing serious injuries in the area.

There are no specific concerns regarding the safety of the highway layout on the roads or junctions directly adjacent to the site as few collisions have occurred at these.

3. Policy Context

3.1 Introduction

This section looks at local and national transport planning policies relevant to this development and considers how the development proposals respond to this.

3.2 National Planning Policy Framework

The revised National Planning Policy Framework was published in February 2019 (updated in June 2019) and sets out the government's planning policies for England and how these are expected to be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.

This revised Framework replaces the previous National Planning Policy Framework published in July 2018.

"The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

a) *an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*

b) *a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*

c) *an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.*

Paragraph 102 of the NPPF states that "Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) *the potential impacts of development on transport networks can be addressed;*

b) *opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*

c) *opportunities to promote walking, cycling and public transport use are identified and pursued;*

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.

In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users; and

c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

Within this context, applications for development should:

a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for the efficient delivery of goods, and access by service and emergency vehicles; and

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.

All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed."

3.3 Greater Manchester Transport Strategy 2040

"The 2040 Vision for Transport, which was consulted on in 2015, will set the scene for the start of a radical, and ambitious, new approach to planning the transport system in support of long-term needs and aspirations. This Transport Strategy builds on the Vision, highlighting the priority interventions needed to achieve it and supported by a 5-year plan, which identifies the first steps towards its delivery.

Priority interventions build on the success of the existing transport investment programme, which is the largest outside London. This ranges from transformational investment in HS2 and new, fast east-west

rail connections across the North, to establishing Greater Manchester as a modern, pedestrian and cycle-friendly city region. The local road system will be much more reliable and safe for all users, including freight and commercial traffic. And, crucially, the strategy will build on the success of the commuter revolution, which Metrolink and improved local rail services have brought over the past 20 years, with the delivery of new and enhanced rapid transit links and a transformed local bus network.

This Strategy focuses on tackling the critical long-term challenges we are facing in Greater Manchester, such as a rapidly growing and ageing population, climate change and the need to improve productivity and reduce social inequality in our city region. This is supported by a more holistic approach to the needs of passengers and freight, with a strong focus on integration; both in terms of transport and wider policy areas, such as spatial planning and health. Technology and innovation also have a key role to play. A consistent and long-term approach will be taken to tackling these major challenges but will also review the strategy on a regular basis to respond to changing trends and new opportunities and priorities."

The Transport Strategy states an aspiration that 10% of all trips should be made by bike by 2025.

3.4 Manchester Core Strategy 2012

"Policy T 1 Sustainable Transport

To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:

- *Improve choice by developing alternatives to the car.*
- *Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car.*
- *Improve access to transport services and facilities in order to enable disabled people and people with mobility impairments to participate fully in public life.*
- *Improve pedestrian routes and the pedestrian environment. Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail).*
- *Contribute to improvements to the extent and reliability of the public transport network through safe and attractive waiting and interchange facilities, better priority, improved services and information provision.*
- *Improve and develop appropriate road, rail and water freight transport routes and associated intermodal freight transport facilities in order to assist in the sustainable and efficient movement of goods.*
- *Facilitate modes of transport that reduce carbon emissions e.g. by incorporating charging points for electric vehicles, subject to their appropriate design and location.*
- *Would reduce the negative impacts of road traffic, for example, congestion, air pollution and road accident casualties.*
- *Take account of the needs of road users according to a broad hierarchy consisting of, in order of priority:*

1. *Pedestrians and disabled people*
2. *Cyclists, public transport,*
3. *Commercial access,*
4. *General off-peak traffic,*
5. *General peak time traffic.*

Policy T 2 Accessible areas of opportunity and need

The Council will actively manage the pattern of development to ensure that new development:

- *Is located to ensure good access to the City's main economic drivers, including the Regional Centre, the Oxford Road Universities and Hospitals and the Airport and to ensure good national and international connections*
- *Is easily accessible by walking, cycling and public transport; connecting residents to jobs, centres, health, leisure, open space and educational opportunities.*
- *Particular priority will be given to providing all residents access to strategic employment sites including:*
    - *Links between North Manchester residents and key employment locations, including the City Centre, Central Park, Salford Quays and Chadderton Industrial Estate and Trafford Park.*
    - *Links within East Manchester to employment locations, Central Park and Eastlands in particular.*
    - *Links within Central Area between residents and employment, the Corridor in particular and east/west connectivity for residents in Central Area to employment areas in Trafford and East Manchester.*
    - *Maintaining strong links between residential areas in the South and the Regional Centre and improving connectivity with the Airport.*
    - *Ensuring good links between Wythenshawe residents and the Airport and further employment opportunities in Stockport, Trafford and the Regional Centre.*
- *Within the City Centre, provides a level of car parking which reflects the highly accessible nature of the location, as well as the realistic requirements of the users of the development. Elsewhere, all new development should provide appropriate car parking facilities, taking account of the guidance in appendix B, which reflects policy in the Regional Strategy (RS). In all parts of the City proposals should have regard to the need for disabled and cycle parking, in line with appendix B. If the RS is revoked the Council will continue to use these standards when applying this policy. Standards are set for two different area types:*
    - *District Centres*
    - *Areas not within the City Centre or District Centres*

- *The car parking standards are maximums and the cycle and disabled car parking standards are minimums. However, the Council will take the circumstances of each proposal into account to establish what level of parking is appropriate.*

- *Includes proportionate Traffic Impact Assessments and Travel Plans for all major applications and for any proposals where there are likely to be access or transport issues.*

Policy T 3 Strategic Integration

The Council will support proposals that contribute to an economically and environmentally sustainable transport network including the following strategic transport initiatives:

- *Metrolink extensions to Rochdale, Oldham, Ashton, South Manchester and the Airport.*

- *The Council also supports future aspirations to extend the network to Trafford Park and Stockport.*

- *A second Metrolink crossing in the City Centre.*

- *A Metrolink extension to Marple on the current heavy rail network.*

- *Improvements to the heavy rail infrastructure.*

- *The Cross-City Bus Package comprising new connections through the City Centre to Parrs Wood, Middleton and Salford.*

Any proposals which would prejudice the implementation of the strategic integration of projects will be refused."

3.5 Northern Gateway – Strategic Regeneration Framework

"The Vision for the Northern Gateway is to deliver a series of vibrant, sustainable and integrated residential neighbourhoods within the extended city centre of Manchester. These neighbourhoods will provide a range of housing options in a high-quality, well managed environment, with high levels of connectivity that link the growth of the city centre with surrounding Manchester communities. This will include the delivery of a range of affordable housing products to meet the needs of residents on a range of incomes. The Northern Gateway SRF will support longterm growth and promote economic, social and cultural uses to support the creation of high performing and sustainable new communities where people choose to live, work, and play."

Core objectives presented to support the regeneration framework are listed as follows:

1. A unique and high-quality residential-led regeneration scheme,

2. A varied network of high-quality green streets and public open spaces,

3. Manchester's unique city river park,

4. Build on the best of what is there,

5. Improve connectivity across the northern gateway and beyond,

6. Create new gateways to and from the city centre,

7. Promote truly sustainable places,

8. Foster the emergence of local retail and service hubs.

The proposed development is within the 'Collyhurst Village' neighbourhood of the Northern Gateway which is to be a residential-led neighbourhood with a distinctive sense of place, a mix of housing options and a dynamic community heart.

3.6 Response to Policy

The site is located northeast of the city centre and accessible via existing public transport, cycle and pedestrian routes. Additionally, the proposed development will include facilities for cyclists, while a travel plan, submitted alongside the planning application under separate cover, will promote the use of sustainable modes of transport and discourage the use of the single occupancy private car. The proposed development is therefore in accordance with the core objectives presented in the Northern Gateway Strategic Regeneration Framework and the local and national policies outlined above.

The proposals for Collyhurst therefore accord with existing local and national transport policies.

4. Proposed Development

4.1 The Development

The development proposals include the following:

- 244 Residential Units comprised of 76 apartments and 168 houses;
- 262 sqm Commercial/communal space;
- 412 Secure, Covered Cycle Parking Spaces, 15 communal spaces in the park;
- 200 Car parking spaces; and,
- The reinstatement of Marston St in the north of the site.

100 of the units will be for social rent as requested by Manchester City Council, all 76 apartments and 24 of the houses will be for social rent.

The development proposals are included within Appendix A.

4.2 Pedestrian Access

Pedestrians can access the site from all directions. There is a footway surrounding the perimeter of the site and all streets within the site have footways on either side and the parking courts are designed to be pedestrian friendly with a low speed environment. There are streets on site that have no through route for vehicles but do have footways to connect through the site. Between the blocks of housing there is a proposed network of footways that connect through the site and provide direct access from parking areas to the gardens, in some instances these are gated and provide access for residents only rather than the general public, for example the access by the bus stop on Rochdale Road. The parking areas and internal streets have a different surface type to the surrounding streets and footways to encourage slower vehicle speeds and make these areas for pedestrian movement as well as vehicle movement. Footways are also designed to be continuous at junctions throughout the site, that is the surface of the carriageway raised to the level of the footway and footway surfacing continued across the footway to make walking through the development more pleasant and act as traffic calming.

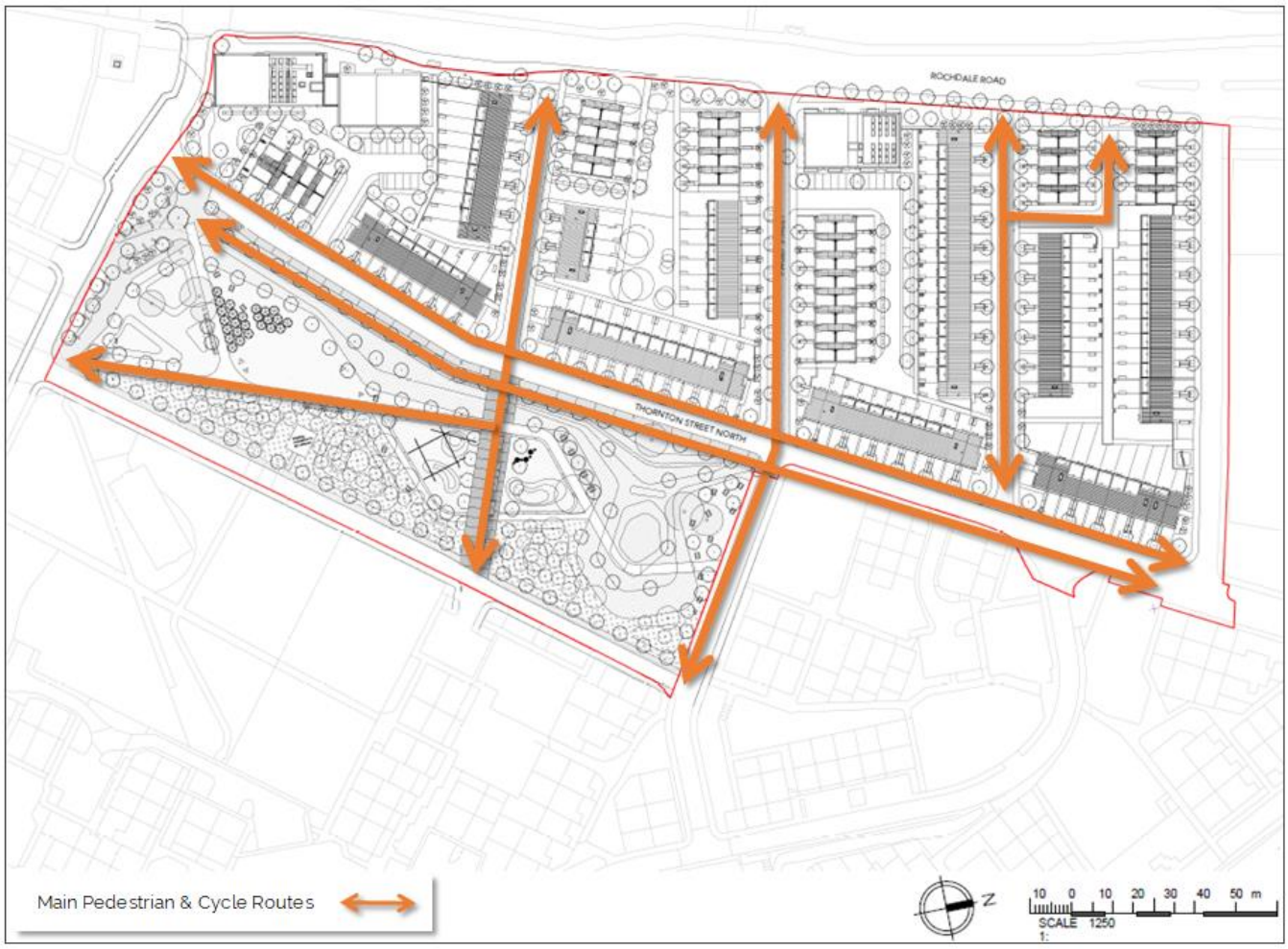

Figure 9: Main pedestrian and cycle routes through the site

4.3 Cycle Access and Cycle Parking

412 cycle parking spaces will be provided in secure cycle stores located within gardens or driveways of the houses and in secure indoor stores on the ground floor with direct access from the street for the apartments, which is in accordance with Manchester City Council guidelines[5]. A furth 15 space for communal use will be located in the park.

4.4 Public Transport Access

Residents of the proposed development will be able to access the development using existing public transport services. As noted in Section 2.5, there are bus services that run directly past the site along Rochdale Road. The southbound stop is adjacent to the site, accessible from the street just to the north that provides access for pedestrians and cycles but is not a through-route for vehicles. The nearest Metrolink stop is Monsall approximately 600m to the northeast of the site.

[5] Manchester Residential Quality Guidance 2017 (accessed 20 Oct 2020)
https://www.manchester.gov.uk/downloads/download/6682/residential_quality_guide

4.5 Vehicle Access and Parking

200 car parking spaces will be provided on-site. The houses all have one space in a driveway within the curtilage of the property, 50% of these will have EV charging installed while the remaining will have infrastructure to enable instalment in the future. The apartments have communal parking courts located in the centre of the blocks, 10% of the spaces (3 parking spaces) in the communal parking will have EV charging. The apartment car parking will be secured by drop bollards and letting/allocation of the spaces will be managed by the social rent RP (MCC). 8 visitor spaces are located within the living streets.

Vehicle access to the site from Rochdale Road is either via Paget street, Shellard Road, or the reinstated Marston Street to the north of the site. Access from Thornton Street North can be from Paget Street but also directly into the southern block and via two new (unnamed) streets. The intention is for these new streets to be adopted by MCC, see Appendix B for the adoption plan.

There are approximately 28 additional spaces provided on the east side of Thornton Street North that are for use by visitors to the park but could also be used for visitors to residents of the development. Furthermore, there is an opportunity for a car club space to be designated in one of the on-street spaces to further encourage residents to use private vehicles less.

4.6 Parking Strategy

The number of parking spaces at the development was raised as a concern during local consultations. An analysis of the exiting car ownership levels by tenure was undertaken using census data for the Lower Super Output Area Manchester 009G in which the development sits. For this area, the census shows that 52% of households that are owned have one car and 20% have two or more cars. For socially rented properties in the area, 21% had one car and 2% had two or more cars[6].

Assuming that car ownership levels in this area are representative of the households that will be in the area once the development is complete, these percentages have been applied to the number of units at the proposed development.

Table 3: Car availability analysis

	Private houses	Socially rented houses/flats	Visitor parking	Totals
Number of units	144	100	-	244
% of households with 1 car	52%	21%	-	-
Number of households with 1 car	74	21	-	95

[6] LC4416EW - Tenure by car or van availability by number of usual residents aged 17 or over in household. 2011 census, LSOA Manchester 009G.

	Private houses	Socially rented houses/flats	Visitor parking	Totals
% of households with 2 or more cars	20%	2%	-	-
Number of households with 2 or more cars	29	2	-	31
Estimated number of cars	133	25	-	158
Number of parking spaces proposed	144	48	8	200

To calculate the number of cars for households shown to have two or more cars it have been assumed that these households have two cars, this is based on census data showing that in this area 71% of households have no car, 25% have one car and 4% have 2 cars when considering all tenures[7].

What this analysis shows is that the number of parking spaces that are proposed at the development exceed the number of spaces that would currently be required based on existing car ownership data for the area. However, because many of these will be at the houses, the spaces that are not in use will be on residents driveways, useful for the residents should they have visitors who have driven to the site but will not benefit the parking demand across the development.

4.7 Servicing and Deliveries

The quiet nature of the streets within the proposed development means that servicing and deliveries should be able to take place adjacent to the house where the delivery is taking place. The streets surrounding the site are all two-way with no Traffic Regulation Orders to prevent a vehicle from loading or unloading for a short period of time. The parking courts could also be used if access is required into the rear of any property.

Bin stores are located in covered stores to the front of the houses and on the ground floor of the apartment blocks. The apartment block bin stores will have secure doors that do not open across the footway to ensure that no obstruction is caused to pedestrians during servicing. Refuse collections will take place from the streets, turning heads have been provided in the parking courts to allow vehicles to turn and reduce the distance one may need to reverse.

The development proposals have been tracked with the MCC Design Refuse Vehicle which is 11.52m long and 3m wide. Manoeuvrers can be accommodated in all streets across the development other than in the living street to Plot C. For Plot C an alternative strategy for refuse collection has been developed which could see refuse collected from Paget Street within

[7] QS416EW - Car or van availability. 2011 census, LSOA Manchester 009G.

acceptable walking and drag distances for residents and operatives. Based on correspondence with MCC it is understood that the Olympus OL-27W 8x4MS is the largest vehicle which currently operates within the MCC fleet; this vehicle is smaller than the design vehicle and could access all streets within the proposed development including the living street within Parcel C.

Vehicle tracking for refuse and fire appliances can be found in Appendix C.

5. Trip Generation and Distribution

5.1 Approach

This section of the report details the estimated trip rates and trip generation for the proposed development. Current guidance states that multi-modal trips need to be assessed in order to determine the overall trip generation via all modes, not just vehicular trips. This approach was discussed with the HFAS team, where possible comments have been incorporated below.

5.2 Person Trip Rates and Trip Generation

Weekday person trip generation for the residential development has been derived using the TRICS database. The TRICS search criteria are summarised in Table 4. TRICS data for sites located in the 'Suburban Area' and 'Edge of Town have been used within this assessment as they most accurately represent the location of the proposed development. Regions selected for surveys included all of the UK (except Greater London). Due to the mix of housing proposed at the development, privately owned houses and affordable houses and apartments, three land use categories were chosen, the search criteria are shown in Table 4. Appendix D contains the output from the TRICS database.

Table 4: TRICS search Criteria

Proposed Land Use	TRICS Category	Location
Residential	03-A Houses Privately Owned	Suburban Area Edge of Town
	03-B Affordable Houses	
	03-D Affordable Flats	

Table 5 shows the total person trip rates per dwelling and the trip generation for the AM and PM peak hour at the proposed development.

Table 5: Peron trip rates and trip generation

Land use category	Number of dwellings	AM Peak Hr (08:00 - 09:00)			PM Peak Hr (17:00 - 18:00)		
		In	Out	Total	In	Out	Total
Trip Rates							
03-A Houses Privately Owned	144	0.191	0.761	0.952	0.619	0.26	0.879
03-B Affordable Houses	24	0.323	1.02	1.343	0.667	0.394	1.061
03-D Affordable Flats	76	0.146	0.315	0.461	0.292	0.18	0.472

Land use category	Number of dwellings	AM Peak Hr (08:00 - 09:00)			PM Peak Hr (17:00 - 18:00)		
		In	Out	Total	In	Out	Total
Trips							
03-A Houses Privately Owned	144	28	110	137	89	37	127
03-B Affordable Houses	24	8	24	32	16	9	25
03-D Affordable Flats	76	11	24	35	22	14	36
Total	244	46	158	204	127	61	188

5.3 Modal Split

The modal split for the proposed development has been taken from the Northern Gateway Technical Services – Transport Evidence Report, issued by Arup in 2018. This provides a more up-to-date mode share than the 2011 census, and considers all journeys, not just travel to work as recorded by the census. The report provides mode share estimates for each phase of the Northern Gateway Strategic Regeneration Framework, based on existing mode share information and adjusted to reflect anticipated shifts in travel behaviour. The document was produced following consultation with MCC and TfGM, considering key transport interventions in the northern gateway area, including improvements to the public transport, and cycling networks. This development sits within Phase 1 so the mode shares for this Phase have been used.

The proposed modal split is shown in Table 6. With the implementation of an effective development travel plan, and the proposed improvements to public transport and active travel infrastructure, it is reasonable to expect that a 20% mode share for people driving in the peak hour can be achieved.

Table 6 shows the multi-modal peak hour trips to and from the site calculated using the TRICS total person trip generation and the proposed modal split from the Transport Evidence Report.

Table 6: Proposed Modal Split and Trip Generation by Mode

Mode of Transport	Mode Share	AM Peak Hr (08:00 - 09:00)			PM Peak Hr (17:00 - 18:00)		
		In	Out	Total	In	Out	Total
Underground, metro, light rail, tram	5%	2	8	10	6	3	9
Train	1%	0	2	2	1	1	2
Bus, minibus or coach	14%	6	22	29	18	8	26
Taxi	3%	1	5	6	4	2	6
Motorcycle, scooter or moped	0%	0	0	0	0	0	0
Driving a car or van	20%	9	32	41	25	12	38
Passenger in a car or van	13%	6	21	27	17	8	24
Bicycle	10%	5	16	20	13	6	19
On foot	35%	16	55	72	45	21	66
Total	**100%***	**46**	**158**	**204**	**127**	**61**	**188**

**subject to rounding error.*

5.4 Vehicle Trips

The number of vehicle trips is assumed to be equivalent to the number of person trips made by people driving a car, van or motorcycle. According to Table 6, there would be 41 trips generated in the AM peak hour, and 38 in the PM peak hour.

5.5 Trip Distribution

Travel to work data from the 2011 census gives the origin and destination data of people travelling from MSOAs Manchester 009 and Manchester 056 by car to the rest of Greater Manchester and throughout the rest of the UK. Although this information is only for travel to work, rather than all trips, because the network peak coincides with people travelling to work it allows the trips generated from the site to be distributed across the network to assess the impact during the peak hours. The origin/destination data was analysed using routing information from google maps and the most likely routes were used to inform the trip distribution. Where more than one route choice was available, the trips were split evenly between the different routes. For example, heading north on Rochdale Road can be done via Paget Street or Carslake Road, 17% travel north on Rochdale Road so, 8.5% was assigned to each option. The same approach was repeated for other the directions that could be started from the site, leave by different exits but heading to the same destination. A diagram of the trip distribution percentages and resulting development trips on the network can be seen in Appendix E.

The trip distribution diagrams show that most vehicle trips are expected to head east from the site towards Carslake Road and onto Queens Road. However, the distribution is such that no single junction will experience an increase of more than 30 two-way trips in the peak hour. It is therefore proposed that no further traffic analysis or junction operational modelling will be required.

6. Transport Impact

6.1 Pedestrian

All modes of transport generally start and/or end with walking, whether to a car park, bus stop, tram stop, train station or cycle parking. Based on the person trip generation calculated in section 5.3, the development is expected to generate 72 and 66 additional pedestrian movements (journeys only on foot) on the local footways, in the AM and PM peak hours, respectively. Additional walking trips are generated by people travelling on public transport as they walk from the development to a transport node. There are estimated at 41 during the AM peak and 38 during the PM peak. Combined, this equates to one or two people per minute during the AM and PM peak hours. Spread over multiple streets and the pedestrian network in the area, this is unlikely to cause congestion or require footway widening. The impact on public transport networks is discussed in section 6.3.

The creation of new walking routes through the site will increase the permeability and pedestrian connectivity of the site, the improvements are mostly seen in the east west connections across the site some of which are currently of poor standard.

6.2 Cycle

A total of 412 cycle parking spaces are to be provided at the proposed development. The trip generation for cycles shows the proposed development is expected to generate 20 trips in the AM peak and 19 trips in the PM peak, this increase is unlikely to cause congestion of current facilities. The proposed cycle lane parallel to Rochdale Road will improve the cycle infrastructure here by providing an off-carriageway lane in the southbound direction.

6.3 Public Transport

Table 6 shows that, in the AM peak hour, 41 trips are likely to be taken on the public transport. There would be 38 trips during the PM peak hour. The additional public transport trips generated by the proposed development equate to an average of less than two extra passengers per bus, tram, or train in the peak AM and PM periods. Considering the number and frequency of buses operating along Rochdale Road in addition to tram services within a short distance from the development site, it is assumed that there is capacity on the existing public transport network to accommodate this low number of additional passengers.

6.4 Vehicle Impact and Car Parking

200 car parking spaces will be provided on-site, these are located across the proposed development with many houses having allocated parking in a driveway. Parking is available in parking courts located in the centre of the blocks and on-street parking along the east side of Thornton Street North.

Table 6 indicates that the estimated vehicle trips generated from the site will be 41 during the AM peak and 38 during the PM peak. Once the development traffic is distributed across the local highway network the impact on local junctions is negligible. The proportional increase of vehicles on the local highway network is also low.

The expected level of additional traffic is unlikely to be noticeable when compared with day-to-day fluctuations in traffic, and the impact of traffic from the proposed development on local junctions continues to decrease further away from the site.

Residents of the houses on-site each have their own driveway where they can park a car if they own one. Residents of the apartment blocks will be able to park their cars in the communal parking courts where there are enough spaces for each apartment to park one car. The on-street spaces on Thornton Street North provide visitor parking if needed.

The site's proximity to public transport and cycle infrastructure mean it is possible for residents to choose not to own a car and instead pick more sustainable transport options. There is the opportunity to explore the viability of a car club vehicle on-site which would further decrease residents need to own a private car.

It is therefore considered that the development will not have a significant impact on on-street parking in the area.

6.5 Construction Phase Traffic Impacts

The following measures are recommended in order to minimise any potential impacts of the construction traffic:

- The preferred routes for heavy goods vehicles (HGVs) to and from the site are to be identified and agreed with MCC and TfGM and outlined within a Construction Traffic Management Plan prior to construction.
- Any abnormal loads to be scheduled in consultation with MCC, TfGM and the police, and to be advertised well in advance to minimise possible disruption.
- Major HGV movements to be confined to a designated operational period within hours to be agreed with MCC and TfGM.
- The introduction of measures to ensure the safety of pedestrians by means of barriers to segregate the site from pedestrian routes.
- Temporary Stopping Up Orders may be required for the surrounding streets during the construction of the development. Alternate pedestrian, cyclist and local access vehicle routes will be agreed with MCC and TfGM.

6.6 Travel Plan

The developer is committed to providing a Travel Plan, submitted as part of the planning application documentation, which will promote the use of sustainable modes of transport and discourage the use of the private car. This will build on the sustainable transport measures such as cycle parking, pedestrian access to public transport, and a landscape design to reduce the impact of private vehicle set out in Section 4.

7. Conclusion

FEC is submitting a full planning application for a residential-led development which includes 244 dwellings, comprised of 76 apartments and 168 houses. Civic Engineers have been appointed to prepare a Transport Assessment to accompany the planning application.

This report has provided an assessment of the transportation impacts of the development proposals and has identified any mitigation that may be required. The intention is to provide the necessary information to assist MCC, as the Local Planning Authority, in determining the application.

The report includes a review of the existing transport networks around the site and a summary of national and local transport planning policy. It goes on to describe the development and assess the improvements and impacts on walking, cycling and public transport networks in the area.

The site is located northeast of the city centre and already accessible via existing public transport, cycle, and pedestrian networks. The development will include new facilities for cyclists, cycle stores for residents and visitors, and a southbound cycle lane alongside Rochdale Road. A travel plan, submitted under separate cover, will promote the use of sustainable modes of transport and discourage the use of the single occupancy private cars. In accordance with NPPF, the development will not have a detrimental impact on the highway network. The proposals for Collyhurst therefore accord with existing local and national transport policies.

A total of 412 cycle parking spaces will be provided within the curtilage of each unit or in a shared store for the apartments. An additional 15 cycle stands in the park will allow cyclists to secure their bikes while they visit the development.

The public transport trips generated by the proposed development equate to an average of less than 2 extra passengers per bus or tram in the peak AM and PM periods. Considering the number and frequency of buses operating along Rochdale Road, in addition to the tram services within a short distance from the site, it is assumed that there is capacity on the existing public transport network to accommodate this relatively low number of additional passengers.

Vehicle trips are expected to be well distributed across the road network surrounding the site, as there are multiple directions from which to access and exit the site, rather than all arriving and departing from the same direction.

Servicing and deliveries will be undertaken from the streets within the development, these are expected to have low traffic volumes and will be an acceptable distance from bin stores. Some deliveries may take place from the parking courts for larger items if these areas have closer access to the homes.

There is no reason from a transport perspective, that this development should not be supported.

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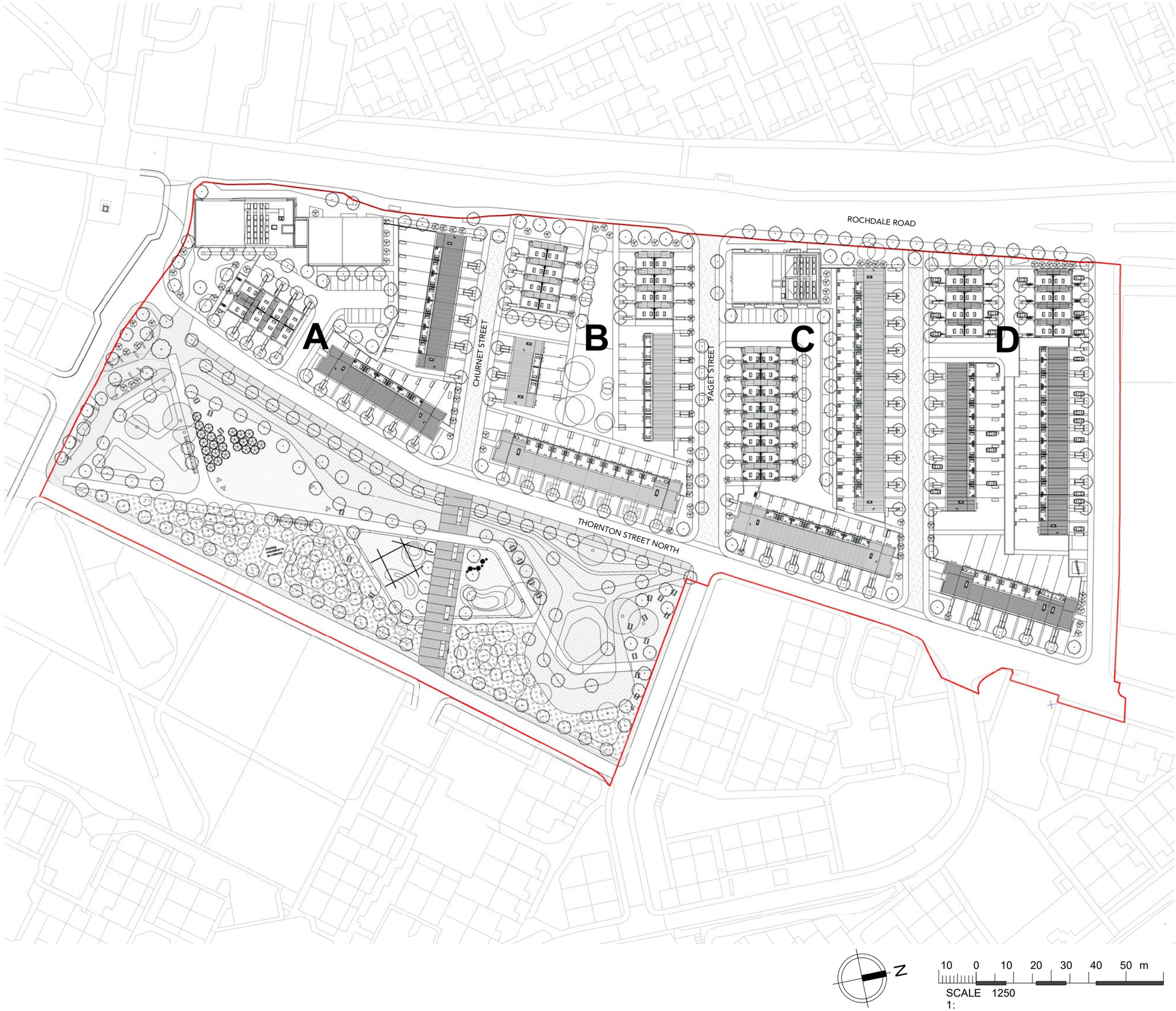
Appendix A

Development Layout



Note:
Do not scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

Plot A

Houses:	28
No. of Apartments:	50
Apartment Storeys:	6 Storeys
Apartment Building Height:	23.100m (Top of Lift Overrun)

Plot B

Houses:	43

Plot C

Houses:	46
No. of Apartments:	26
Apartment Storeys:	5 Storeys
Apartment Building Height:	17.325m (Top of Lift Overrun)

Plot D

Houses:	51

Total **244**

Note: Tallest housetype 4 storeys (top level roof garden).
10.8m to ridge height.

Rev	Date	Intls	Details
P6	04/12/20	LH	Updated to incorporate FEC Comments
P5	02/12/20	LH	Updated 2 Apartment Block Scheme
P4	27/10/20	LH	Red Line Boundary Updated
P3	30/09/20	LH	EIA Issue
P2	11/09/20	LH	EIA Issue
P1	17/04/20	GC	Stage 2 Issue
P0	09/04/20	GC	Tenure Update

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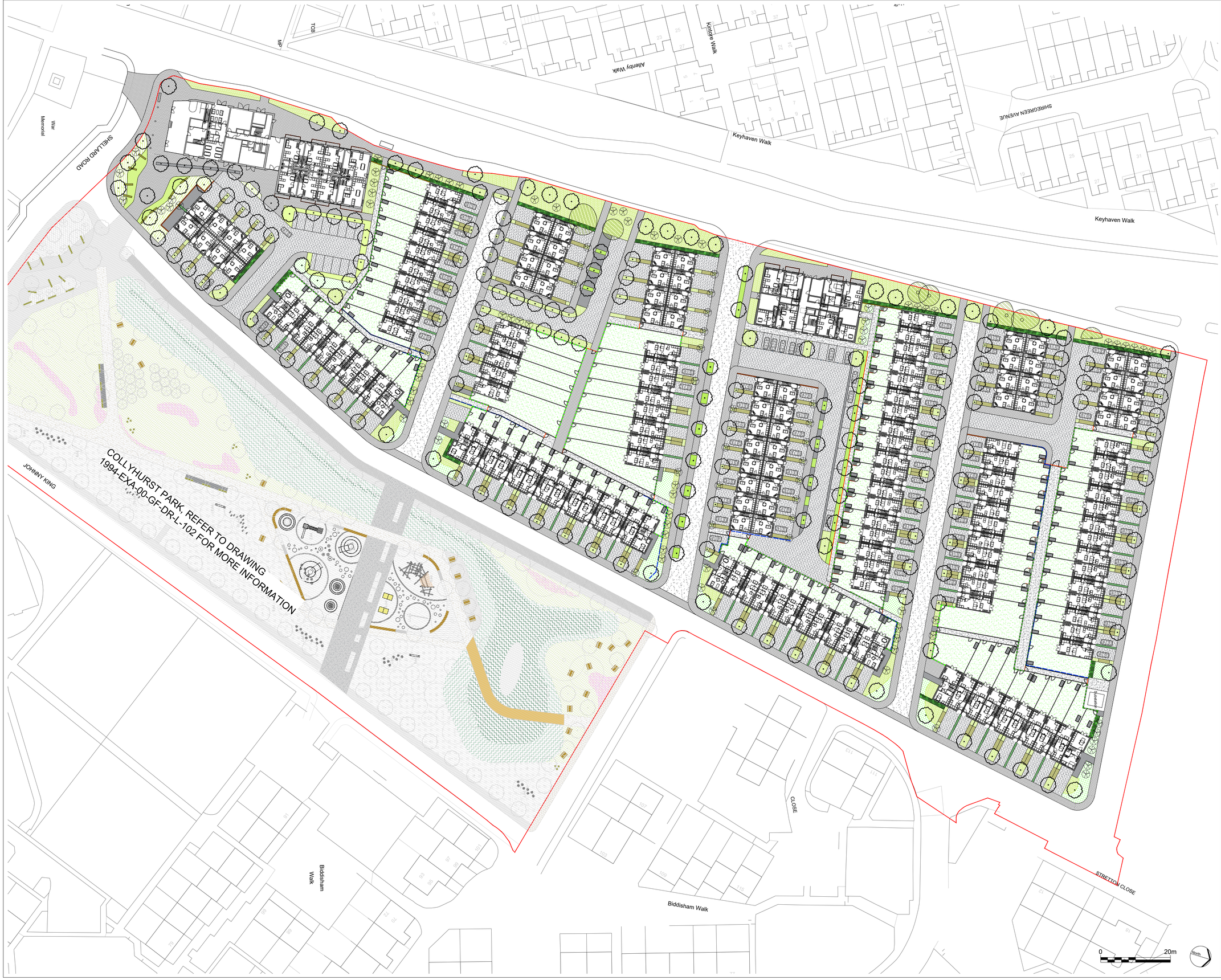
Project Title	Collyhurst Housing
Client	FEC
Location	Manchester
Drawing Title	Proposed Site Location Plan

Date	04/12/2020 13:55:32	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8871-BA-MP-00-DR-A- (04)706- P6



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Client

FEC

KEY

Phase 1 boundary

Existing features

Trees to be retained

Proposed hard landscape

Surface type 1
Kellen H20 permeable paving

Surface type 2
Kellen H20 permeable paving

Surface type 4
PedestrianTarmacadam

Surface type 5
Vehicular Tarmacadam

Reinstated tarmac
Highways specification

Proposed landscape furniture

High brick wall
2.1m High. Details TBC

Green screen
2.2m high. Details TBC

Timber fence
1.8m high. Details TBC

Gate
Details TBC

Low brick wall
Brick to match architectural detailing.
Height: 1.1m

Cycle store

Railing
1.1 High m. Details TBC

Steps to backgardens
Details TBC

Seating
Details TBC

Fold down bollard
Details TBC

Line of retaining wall, retention high varies between 800-300mm
Details TBC

Green screen
2.1m

Proposed soft landscape

Trees
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-201 for details

Specimen
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-201 for details

Hedging
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-203 for details

Ornamental planing type 1
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-203 for details

Ornamental planing type 2
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-203 for details

Sedum roof bin/cycle store

Suds
Refer to planting palette drawing: 1994-EXA-00-GF-DR-L-203 for details

Garden
Hardwearing shade tolerant grass Refer to: 1994-EXA-00-GF-DR-L-203 for details

Public Lawn
Refer to: 1994-EXA-00-GF-DR-L-203 for details

Rev	Description	Date
-	PLANNING ISSUE	??.11.2020

EXTERIOR ARCHITECTURE

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Project title

COLLYHURST NG

DRAFT

Drawing title

COLLYHURST VILLAGE GENERAL ARRANGEMENT PLAN

Issued By	Manchester	T: 0161 850 8101	
Scale	1:500 @ A1	Drawn	ExA
Status	PLANNING	Checked	SPL
Date	??.11.2020	Approved	JM

Drawing number

1994-EXA-00-GF-DR-L-100

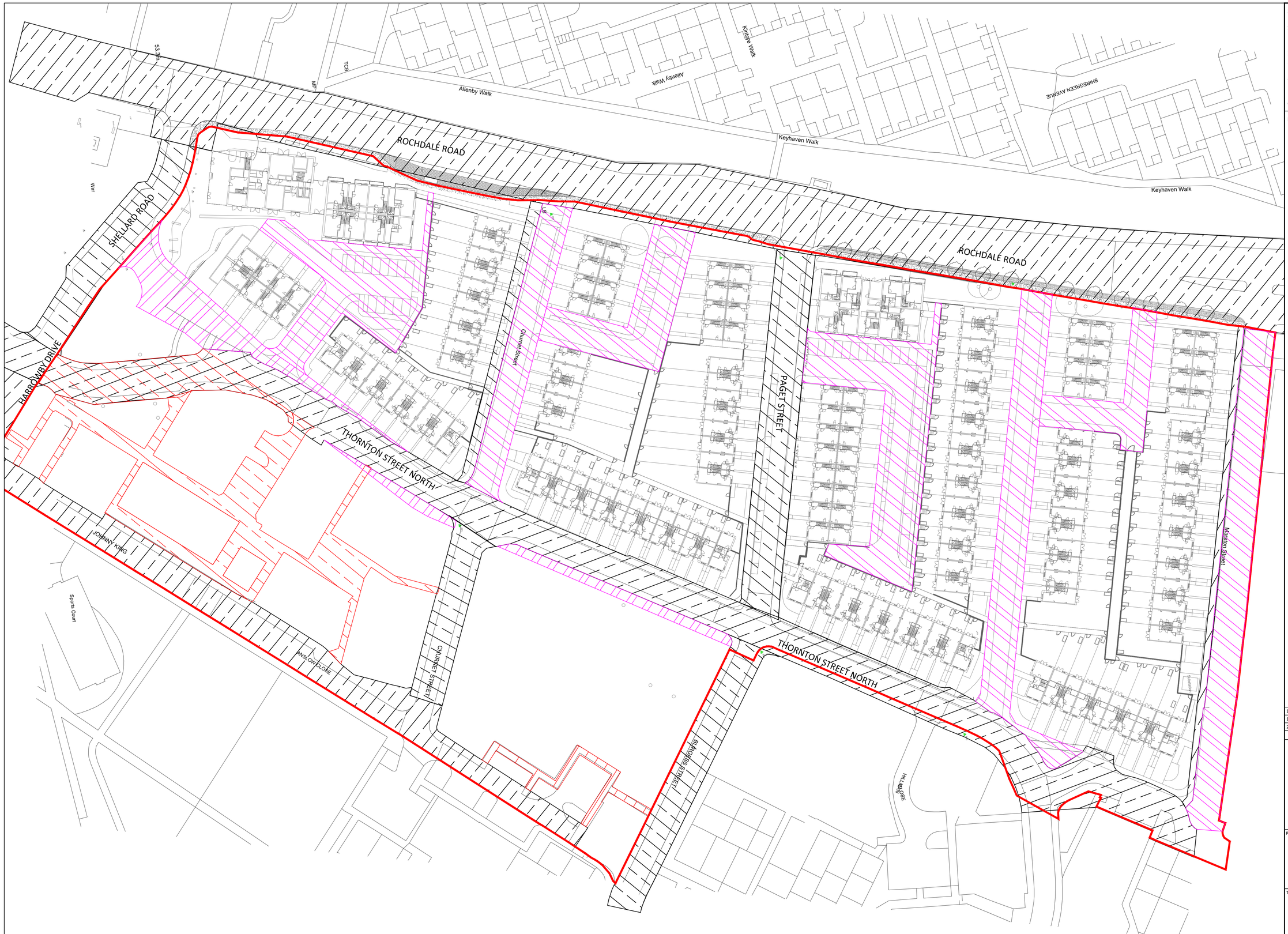
Revision

-

P:\2019\1994 COLLYHURST NG\01 CAD\02 SHEET LAYOUT\1994-COLLYHURST PLANNING\1994-EXA-00-GF-DR-L-100.DWG

Appendix B

Adoption Plan



Standard Notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
4. All discrepancies should be reported to the C.A. prior to the commencement of the works.

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Notes and Keys

A. TOPOGRAPHICAL SURVEY CONDUCTED BY SURVEY OPERATIONS TITLED "TOPOGRAPHICAL SURVEY OF LAND AT: LAND OFF ROCHDALE ROAD COLLYHURST MANCHESTER" DRAWING NUMBER 19K190/003 DATED DECEMBER 2019.
B. SITE LAYOUT RECEIVED FROM EXTERIOR LANDSCAPE ARCHITECTS ON 11/12/2020.

ADOPTED HIGHWAY

PROPOSED ADOPTED HIGHWAY

HIGHWAY EXTENTS REQUIRING STOPPING UP

REDLINE BOUNDARY

Date	Rev	Description	Drawn	Chkd
15.01.20	P03	ISSUED FOR INFORMATION	RSH	PM
12.05.20	P02	ISSUED FOR INFORMATION	LGS	RSH
27.03.20	P01	ISSUED FOR INFORMATION	RSH	PM

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LEEDS Tower Works, Unit 02-01, Globe Road, Leeds, LS11 5QG. Tel: 0113 2505 130
GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829

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Project
COLLYHURST HOUSING
MANCHESTER

Title
COLLYHURST VILLAGE
PROPOSED ADOPTION PLAN

Status
INFORMATION

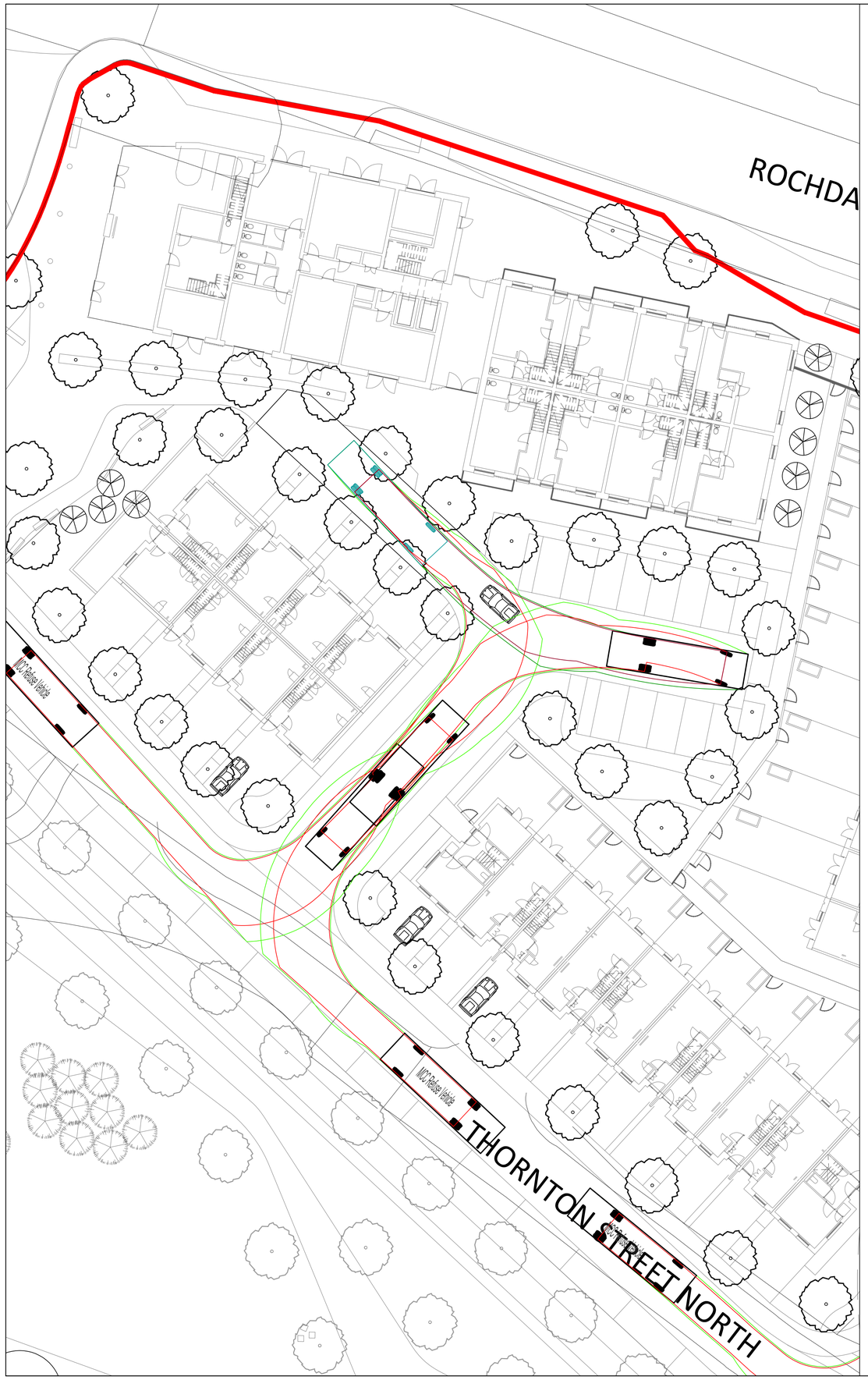
Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:500	26.02.20	LGS	RSH	--

Drawing Number
1226-01-CIV-XX-VIL-DR-HI-0320

Revision
P03

Appendix C

Vehicle Tracking



Standard Notes

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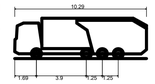
B. SITE LAYOUT PROVIDED BY EXTERIOR LANDSCAPE ARCHITECTS, RECEIVED 11.12.2020
C. AUTODESK VEHICLE TRACKING SOFTWARE AND ARE INDICATIVE ONLY. THE ENVELOPES SHOWN DO NOT MAKE ALLOWANCE FOR DRIVER ABILITY, GRADIENTS AND ALTERNATIVE VEHICLE SPECIFICATIONS.



OLYMPUS OL-27W 8x4MS	
Overall Length	10.290m
Overall Width	2.530m
Overall Body Height	3.153m
Min Body Ground Clearance	0.358m
Track Width	2.200m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.200m

KEY

CHASSIS ENVELOPE

BODY ENVELOPE

15m RADIUS

25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P05	ISSUED FOR PLANNING	RSH	PM
21.10.20	P04	REVISED TRACKING TO UPDATED LAYOUT	RSH	PM
08.04.20	P03	REMOVAL OF DB32 REFUSE VEHICLE	RSH	-
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

Civic Engineers

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LEEDS Tower Works, Unit D2-D3, Globe Road, Leeds, LS11 5QG. Tel: 0113 2025 130
GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PF. Tel: 0141 370 1829

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT A
REFUSE VEHICLE

Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:250	26.02.20	RSH	PM	--

Drawing Number

1226-01-CIV-XX-VIL-DR-HI-0300

Revision

P05

Standard Notes

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Notes and Keys

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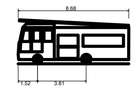
B. SITE LAYOUT PROVIDED BY EXTERIOR LANDSCAPE ARCHITECTS, RECEIVED 11.12.2020
C. AUTODESK VEHICLE TRACKING SOFTWARE AND ARE INDICATIVE ONLY. THE ENVELOPES SHOWN DO NOT MAKE ALLOWANCE FOR DRIVER ABILITY, GRADIENTS AND ALTERNATIVE VEHICLE SPECIFICATIONS.



DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.910m

KEY

- CHASSIS ENVELOPE
- BODY ENVELOPE
- 15m RADIUS
- 25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P03	ISSUED FOR PLANNING	RSH	PM
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829.

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT A
FIRE TENDER

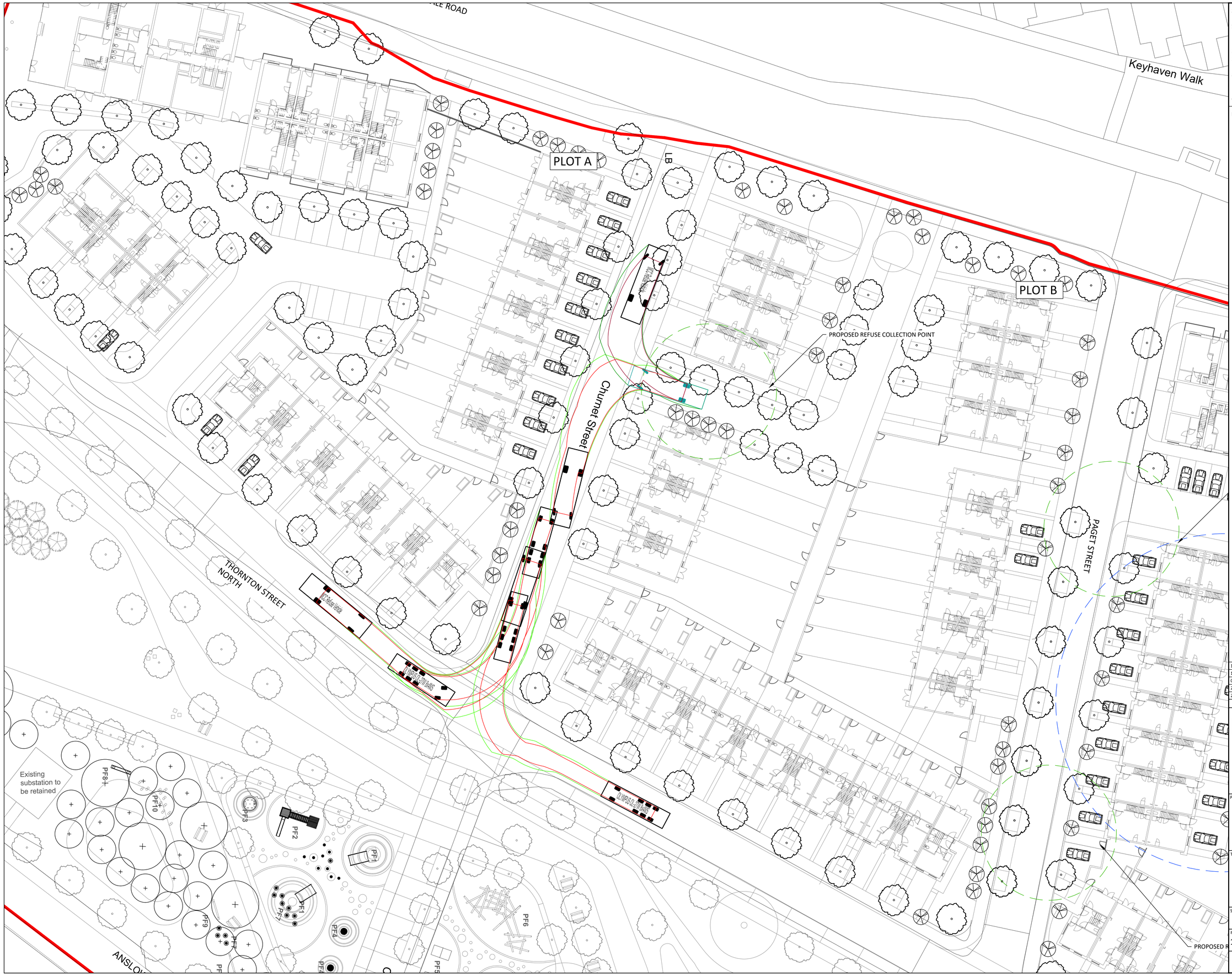
Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:200	26.02.20	RSH	PM	--

Drawing Number: 1226-01-CIV-XX-VIL-DR-HI-0301

Revision: P03



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Notes and Keys

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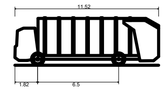
B. SITE LAYOUT PROVIDED BY EXTERIOR LANDSCAPE ARCHITECTS, RECEIVED 11.12.2020
C. AUTODESK VEHICLE TRACKING SOFTWARE AND ARE INDICATIVE ONLY. THE ENVELOPES SHOWN DO NOT MAKE ALLOWANCE FOR DRIVER ABILITY, GRADIENTS AND ALTERNATIVE VEHICLE SPECIFICATIONS.



MCC Refuse Vehicle	
Overall Length	11.520m
Overall Width	3.000m
Overall Body Height	3.804m
Min Body Ground Clearance	0.356m
Track Width	2.800m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	8.940m

KEY

CHASSIS ENVELOPE
BODY ENVELOPE
15m RADIUS
25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P05	ISSUED FOR PLANNING	RSH	PM
11.11.20	P04	MCC WASTE VEHICLE SPEC	RSH	PM
09.04.20	P03	DB32 REFUSE VEHICLE REMOVED	RSH	-
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT B
REFUSE VEHICLE

Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:200	26.02.20	RSH	PM	--

Drawing Number	Revision
1226-01-CIV-XX-VIL-DR-HI-0302	P05

Standard Notes

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Notes and Keys

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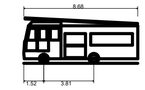
B. SITE LAYOUT PROVIDED BY EXTERIOR LANDSCAPE ARCHITECTS, RECEIVED 11.12.2020
C. AUTODESK VEHICLE TRACKING SOFTWARE AND ARE INDICATIVE ONLY. THE ENVELOPES SHOWN DO NOT MAKE ALLOWANCE FOR DRIVER ABILITY, GRADIENTS AND ALTERNATIVE VEHICLE SPECIFICATIONS.



DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.910m

KEY

CHASSIS ENVELOPE

BODY ENVELOPE

Date	Rev	Description	Drawn	Chkd
16.12.20	P03	ISSUED FOR PLANNING	RSH	PM
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT B
FIRE TENDER

Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:200	26.02.20	RSH	PM	--

Drawing Number: 1226-01-CIV-XX-VIL-DR-HI-0303

Revision: P03

THE LARGEST STANDARD BIFFA REFUSE VEHICLE HAS BEEN USED TO EVALUATE PLOT C.

OLYMPUS OL-27W 8x4MS

PLOT B

PLOT C

PROPOSED REFUSE COLLECTION POINT

PAGET STREET

MCC Refuse Vehicle

PROPOSED REFUSE COLLECTION POINT

Standard Notes

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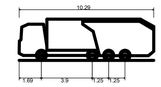
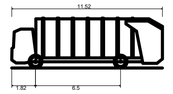


OLYMPUS OL-27W 8x4MS	
Overall Length	10.290m
Overall Width	2.530m
Overall Body Height	3.153m
Min Body Ground Clearance	0.358m
Track Width	2.200m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.200m



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Overall Length	11.520m
Overall Width	3.000m
Overall Body Height	3.804m
Min Body Ground Clearance	0.356m
Track Width	2.800m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	8.940m

KEY

- CHASSIS ENVELOPE
- BODY ENVELOPE
- 15m RADIUS
- 25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P05	ISSUED FOR PLANNING	RSH	PM
21.10.20	P04	REVISED TRACKING TO UPDATED LAYOUT	RSH	PM
08.04.20	P03	D832 VEHICLE REMOVED	RSH	-
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

Civic Engineers

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT C
REFUSE VEHICLE

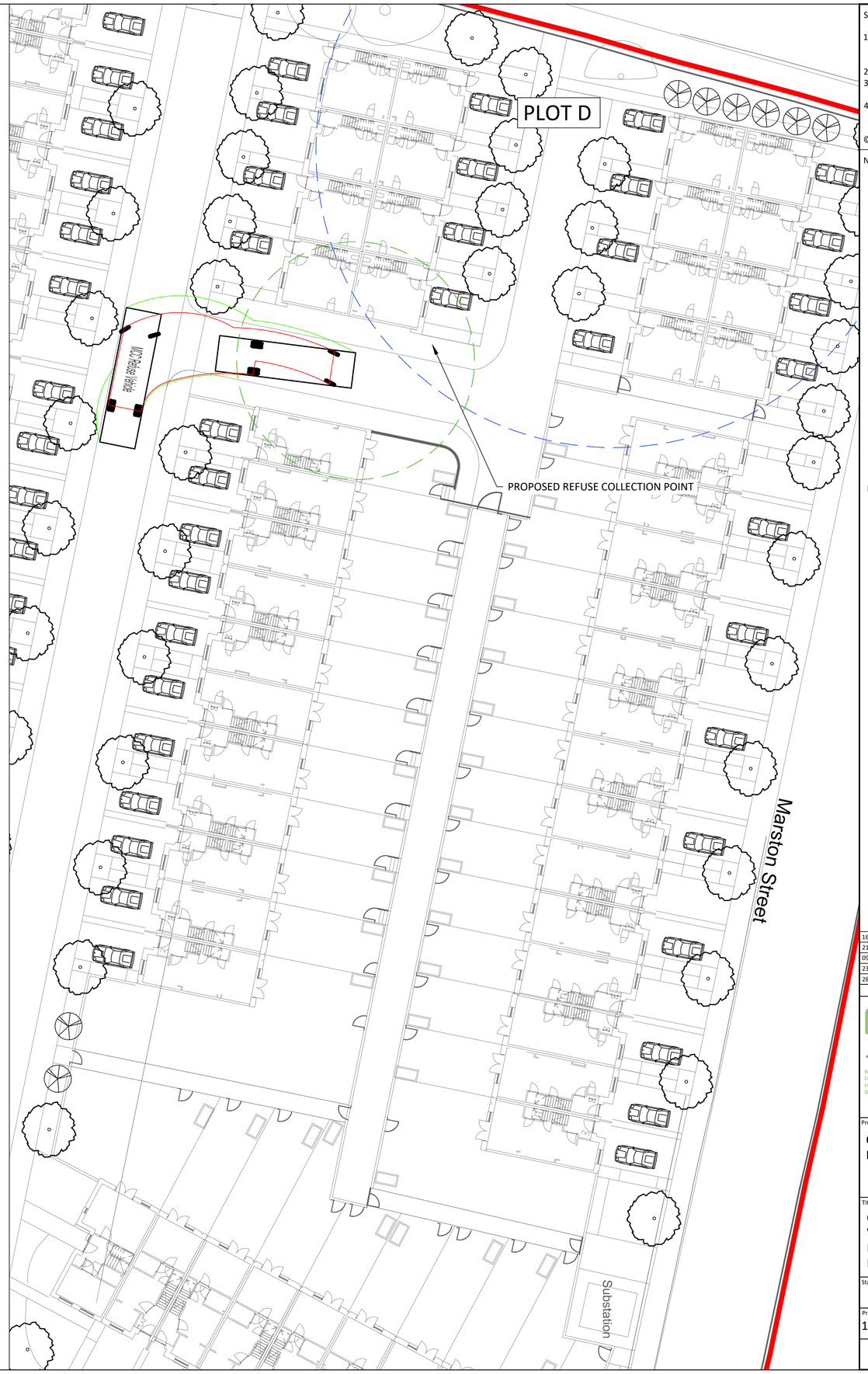
Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:200	26.02.20	RSH	PM	--

Drawing Number: 1226-01-CIV-XX-VIL-DR-HI-0304

Revision: P05



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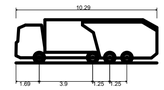

OLYMPUS OL-27W 8x4MS	
Overall Length	10.290m
Overall Width	2.530m
Overall Body Height	3.153m
Min Body Ground Clearance	0.358m
Track Width	2.200m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.200m

KEY

CHASSIS ENVELOPE
BODY ENVELOPE
15m RADIUS
25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P05	ISSUED FOR PLANNING	RSH	PM
21.10.20	P04	TRACKING REVISED TO UPDATED LAYOUT	RSH	PM
09.04.20	P03	DB32 REFUSE TRACKING REMOVED	RSH	RSH
23.03.20	P02	ISSUED FOR INFORMATION	RSH	RSH
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829
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Project
COLLYHURST HOUSING
MANCHESTER

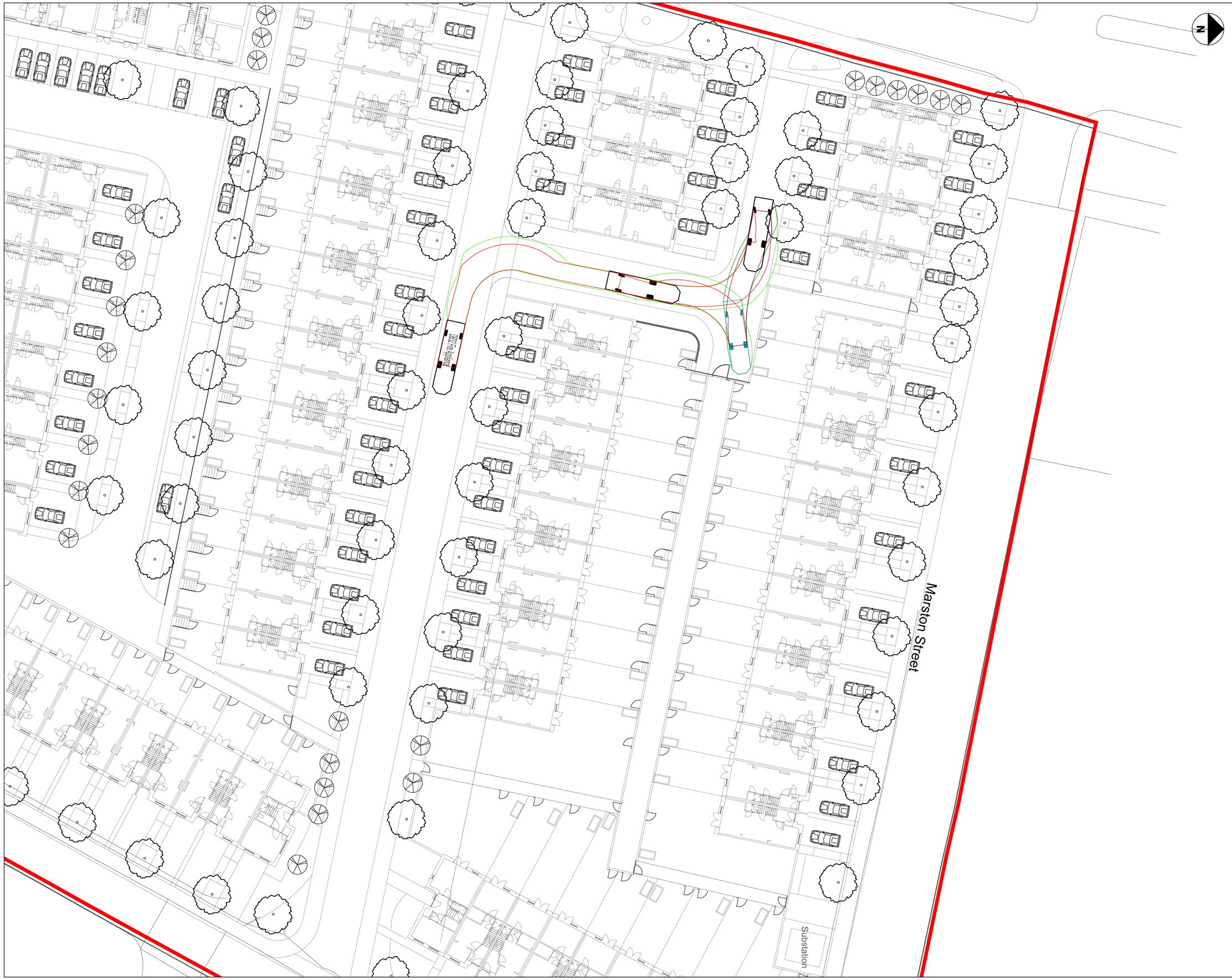
Title
COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT D
REFUSE VEHICLE

Status
INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:200	26.02.20	RSH	PM	--

Drawing Number
1226-01-CIV-XX-VIL-DR-HI-0306

Revision
P05



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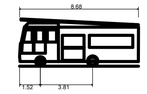

DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.910m

KEY

CHASSIS ENVELOPE

BODY ENVELOPE

15m RADIUS

25m RADIUS

Date	Rev	Description	Drawn	Chkd
16.12.20	P03	ISSUED FOR PLANNING	RSH	PM
23.03.20	P02	ISSUED FOR INFORMATION	RSH	-
28.02.20	P01	ISSUED FOR INFORMATION	RSH	PM

Civic Engineers

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GLASGOW Gresham Chambers, 45 West Nile St, Glasgow, G1 2PT. Tel: 0141 370 1829.

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Project

COLLYHURST HOUSING
MANCHESTER

Title

COLLYHURST VILLAGE (NORTH SITE)
VEHICLE TRACKING
PLOT D
FIRE TENDER

Status

INFORMATION

Project Number	Scale @ A1	Date Created	Drawn	Checked	Suitability
1226-01	1:250	26.02.20	RSH	PM	--

Drawing Number: 1226-01-CIV-XX-VIL-DR-HI-0307

Revision: P03

Appendix D

TRICS Outputs

Calculation Reference: AUDIT-758701-200309-0318

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
	NT	NOTTINGHAMSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 15 to 30 (units:)
Range Selected by User: 6 to 191 (units:)

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 07/10/16

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	1 days
Wednesday	1 days
Thursday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	4 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	4

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	4 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

15,001 to 20,000	1 days
25,001 to 50,000	2 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

100,001 to 125,000	1 days
125,001 to 250,000	1 days
250,001 to 500,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	4 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	4 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 CH-03-D-01 BLOCK OF FLATS CHESHIRE
HEATH LANE
CHESTER
BOUGHTON HEATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 30
Survey date: THURSDAY *24/05/12* *Survey Type: MANUAL*

2 ES-03-D-06 FLATS & HOUSES EAST SUSSEX
WELLINGTON ROAD
BRIGHTON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 15
Survey date: THURSDAY *16/10/14* *Survey Type: MANUAL*

3 LN-03-D-02 FLATS LINCOLNSHIRE
ADDISON DRIVE
LINCOLN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 22
Survey date: WEDNESDAY *01/07/15* *Survey Type: MANUAL*

4 NT-03-D-02 BLOCK OF FLATS NOTTINGHAMSHIRE
WATCOMBE ROAD
NOTTINGHAM
CARRINGTON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 22
Survey date: TUESDAY *23/06/15* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.079	4	22	0.079	4	22	0.158
08:00 - 09:00	4	22	0.090	4	22	0.112	4	22	0.202
09:00 - 10:00	4	22	0.101	4	22	0.124	4	22	0.225
10:00 - 11:00	4	22	0.124	4	22	0.169	4	22	0.293
11:00 - 12:00	4	22	0.067	4	22	0.056	4	22	0.123
12:00 - 13:00	4	22	0.079	4	22	0.101	4	22	0.180
13:00 - 14:00	4	22	0.112	4	22	0.079	4	22	0.191
14:00 - 15:00	4	22	0.101	4	22	0.079	4	22	0.180
15:00 - 16:00	4	22	0.067	4	22	0.101	4	22	0.168
16:00 - 17:00	4	22	0.112	4	22	0.067	4	22	0.179
17:00 - 18:00	4	22	0.146	4	22	0.079	4	22	0.225
18:00 - 19:00	4	22	0.045	4	22	0.045	4	22	0.090
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.123			1.091			2.214

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	15 - 30 (units:)
Survey date date range:	01/01/11 - 07/10/16
Number of weekdays (Monday-Friday):	4
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.011	4	22	0.011	4	22	0.022
08:00 - 09:00	4	22	0.011	4	22	0.011	4	22	0.022
09:00 - 10:00	4	22	0.000	4	22	0.000	4	22	0.000
10:00 - 11:00	4	22	0.000	4	22	0.000	4	22	0.000
11:00 - 12:00	4	22	0.000	4	22	0.000	4	22	0.000
12:00 - 13:00	4	22	0.011	4	22	0.011	4	22	0.022
13:00 - 14:00	4	22	0.022	4	22	0.022	4	22	0.044
14:00 - 15:00	4	22	0.011	4	22	0.011	4	22	0.022
15:00 - 16:00	4	22	0.011	4	22	0.011	4	22	0.022
16:00 - 17:00	4	22	0.000	4	22	0.000	4	22	0.000
17:00 - 18:00	4	22	0.000	4	22	0.000	4	22	0.000
18:00 - 19:00	4	22	0.000	4	22	0.000	4	22	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.077			0.077			0.154

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.000	4	22	0.000	4	22	0.000
08:00 - 09:00	4	22	0.022	4	22	0.000	4	22	0.022
09:00 - 10:00	4	22	0.000	4	22	0.022	4	22	0.022
10:00 - 11:00	4	22	0.000	4	22	0.000	4	22	0.000
11:00 - 12:00	4	22	0.000	4	22	0.000	4	22	0.000
12:00 - 13:00	4	22	0.000	4	22	0.000	4	22	0.000
13:00 - 14:00	4	22	0.000	4	22	0.000	4	22	0.000
14:00 - 15:00	4	22	0.000	4	22	0.000	4	22	0.000
15:00 - 16:00	4	22	0.000	4	22	0.000	4	22	0.000
16:00 - 17:00	4	22	0.000	4	22	0.000	4	22	0.000
17:00 - 18:00	4	22	0.000	4	22	0.000	4	22	0.000
18:00 - 19:00	4	22	0.000	4	22	0.000	4	22	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.022			0.022			0.044

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.000	4	22	0.011	4	22	0.011
08:00 - 09:00	4	22	0.011	4	22	0.022	4	22	0.033
09:00 - 10:00	4	22	0.000	4	22	0.011	4	22	0.011
10:00 - 11:00	4	22	0.011	4	22	0.000	4	22	0.011
11:00 - 12:00	4	22	0.000	4	22	0.000	4	22	0.000
12:00 - 13:00	4	22	0.000	4	22	0.000	4	22	0.000
13:00 - 14:00	4	22	0.000	4	22	0.000	4	22	0.000
14:00 - 15:00	4	22	0.000	4	22	0.000	4	22	0.000
15:00 - 16:00	4	22	0.000	4	22	0.000	4	22	0.000
16:00 - 17:00	4	22	0.000	4	22	0.011	4	22	0.011
17:00 - 18:00	4	22	0.022	4	22	0.000	4	22	0.022
18:00 - 19:00	4	22	0.000	4	22	0.000	4	22	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.044			0.055			0.099

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.101	4	22	0.112	4	22	0.213
08:00 - 09:00	4	22	0.101	4	22	0.157	4	22	0.258
09:00 - 10:00	4	22	0.101	4	22	0.146	4	22	0.247
10:00 - 11:00	4	22	0.169	4	22	0.225	4	22	0.394
11:00 - 12:00	4	22	0.079	4	22	0.079	4	22	0.158
12:00 - 13:00	4	22	0.135	4	22	0.124	4	22	0.259
13:00 - 14:00	4	22	0.112	4	22	0.079	4	22	0.191
14:00 - 15:00	4	22	0.146	4	22	0.124	4	22	0.270
15:00 - 16:00	4	22	0.112	4	22	0.135	4	22	0.247
16:00 - 17:00	4	22	0.191	4	22	0.079	4	22	0.270
17:00 - 18:00	4	22	0.135	4	22	0.112	4	22	0.247
18:00 - 19:00	4	22	0.056	4	22	0.045	4	22	0.101
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.438			1.417			2.855

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.011	4	22	0.022	4	22	0.033
08:00 - 09:00	4	22	0.034	4	22	0.135	4	22	0.169
09:00 - 10:00	4	22	0.056	4	22	0.112	4	22	0.168
10:00 - 11:00	4	22	0.124	4	22	0.067	4	22	0.191
11:00 - 12:00	4	22	0.135	4	22	0.101	4	22	0.236
12:00 - 13:00	4	22	0.090	4	22	0.067	4	22	0.157
13:00 - 14:00	4	22	0.079	4	22	0.101	4	22	0.180
14:00 - 15:00	4	22	0.112	4	22	0.112	4	22	0.224
15:00 - 16:00	4	22	0.225	4	22	0.101	4	22	0.326
16:00 - 17:00	4	22	0.034	4	22	0.056	4	22	0.090
17:00 - 18:00	4	22	0.124	4	22	0.067	4	22	0.191
18:00 - 19:00	4	22	0.056	4	22	0.067	4	22	0.123
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.080			1.008			2.088

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.000	4	22	0.056	4	22	0.056
08:00 - 09:00	4	22	0.000	4	22	0.000	4	22	0.000
09:00 - 10:00	4	22	0.000	4	22	0.022	4	22	0.022
10:00 - 11:00	4	22	0.022	4	22	0.056	4	22	0.078
11:00 - 12:00	4	22	0.000	4	22	0.011	4	22	0.011
12:00 - 13:00	4	22	0.022	4	22	0.034	4	22	0.056
13:00 - 14:00	4	22	0.034	4	22	0.011	4	22	0.045
14:00 - 15:00	4	22	0.000	4	22	0.034	4	22	0.034
15:00 - 16:00	4	22	0.022	4	22	0.000	4	22	0.022
16:00 - 17:00	4	22	0.079	4	22	0.011	4	22	0.090
17:00 - 18:00	4	22	0.011	4	22	0.000	4	22	0.011
18:00 - 19:00	4	22	0.034	4	22	0.000	4	22	0.034
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.224			0.235			0.459

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.000	4	22	0.056	4	22	0.056
08:00 - 09:00	4	22	0.000	4	22	0.000	4	22	0.000
09:00 - 10:00	4	22	0.000	4	22	0.022	4	22	0.022
10:00 - 11:00	4	22	0.022	4	22	0.056	4	22	0.078
11:00 - 12:00	4	22	0.000	4	22	0.011	4	22	0.011
12:00 - 13:00	4	22	0.022	4	22	0.034	4	22	0.056
13:00 - 14:00	4	22	0.034	4	22	0.011	4	22	0.045
14:00 - 15:00	4	22	0.000	4	22	0.034	4	22	0.034
15:00 - 16:00	4	22	0.022	4	22	0.000	4	22	0.022
16:00 - 17:00	4	22	0.079	4	22	0.011	4	22	0.090
17:00 - 18:00	4	22	0.011	4	22	0.000	4	22	0.011
18:00 - 19:00	4	22	0.034	4	22	0.000	4	22	0.034
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.224			0.235			0.459

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	22	0.112	4	22	0.202	4	22	0.314
08:00 - 09:00	4	22	0.146	4	22	0.315	4	22	0.461
09:00 - 10:00	4	22	0.157	4	22	0.292	4	22	0.449
10:00 - 11:00	4	22	0.326	4	22	0.348	4	22	0.674
11:00 - 12:00	4	22	0.213	4	22	0.191	4	22	0.404
12:00 - 13:00	4	22	0.247	4	22	0.225	4	22	0.472
13:00 - 14:00	4	22	0.225	4	22	0.191	4	22	0.416
14:00 - 15:00	4	22	0.258	4	22	0.270	4	22	0.528
15:00 - 16:00	4	22	0.360	4	22	0.236	4	22	0.596
16:00 - 17:00	4	22	0.303	4	22	0.157	4	22	0.460
17:00 - 18:00	4	22	0.292	4	22	0.180	4	22	0.472
18:00 - 19:00	4	22	0.146	4	22	0.112	4	22	0.258
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.785			2.719			5.504

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Calculation Reference: AUDIT-758701-200309-0315

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL VEHICLES

Selected regions and areas:

07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	2 days
08	NORTH WEST		
	MS	MERSEYSIDE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 16 to 54 (units:)
Range Selected by User: 14 to 280 (units:)

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 19/09/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Thursday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	3 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	1
Edge of Town	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	2
Built-Up Zone	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	3 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	1 days
10,001 to 15,000	1 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
75,001 to 100,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	3 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	3 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 MS-03-B-01 TERRACED MERSEYSIDE
TARBOCK ROAD
LIVERPOOL
SPEKE
Edge of Town
Residential Zone
Total Number of dwellings: 16
Survey date: TUESDAY *18/06/13* *Survey Type: MANUAL*

2 WY-03-B-02 MIXED HOUSES WEST YORKSHIRE
WHITEACRE STREET
HUDDERSFIELD
DEIGHTON
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: TUESDAY *17/09/13* *Survey Type: MANUAL*

3 WY-03-B-03 TERRACED HOUSES WEST YORKSHIRE
LINCOLN GREEN ROAD
LEEDS

Suburban Area (PPS6 Out of Centre)
Built-Up Zone
Total Number of dwellings: 29
Survey date: THURSDAY *19/09/13* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.081	3	33	0.091	3	33	0.172
08:00 - 09:00	3	33	0.162	3	33	0.313	3	33	0.475
09:00 - 10:00	3	33	0.263	3	33	0.283	3	33	0.546
10:00 - 11:00	3	33	0.162	3	33	0.172	3	33	0.334
11:00 - 12:00	3	33	0.121	3	33	0.111	3	33	0.232
12:00 - 13:00	3	33	0.131	3	33	0.131	3	33	0.262
13:00 - 14:00	3	33	0.101	3	33	0.101	3	33	0.202
14:00 - 15:00	3	33	0.182	3	33	0.131	3	33	0.313
15:00 - 16:00	3	33	0.182	3	33	0.192	3	33	0.374
16:00 - 17:00	3	33	0.101	3	33	0.172	3	33	0.273
17:00 - 18:00	3	33	0.192	3	33	0.131	3	33	0.323
18:00 - 19:00	3	33	0.172	3	33	0.081	3	33	0.253
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.850			1.909			3.759

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	16 - 54 (units:)
Survey date date range:	01/01/11 - 19/09/13
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.000	3	33	0.000	3	33	0.000
08:00 - 09:00	3	33	0.010	3	33	0.010	3	33	0.020
09:00 - 10:00	3	33	0.040	3	33	0.030	3	33	0.070
10:00 - 11:00	3	33	0.020	3	33	0.040	3	33	0.060
11:00 - 12:00	3	33	0.040	3	33	0.040	3	33	0.080
12:00 - 13:00	3	33	0.030	3	33	0.020	3	33	0.050
13:00 - 14:00	3	33	0.000	3	33	0.010	3	33	0.010
14:00 - 15:00	3	33	0.030	3	33	0.020	3	33	0.050
15:00 - 16:00	3	33	0.020	3	33	0.020	3	33	0.040
16:00 - 17:00	3	33	0.020	3	33	0.020	3	33	0.040
17:00 - 18:00	3	33	0.010	3	33	0.010	3	33	0.020
18:00 - 19:00	3	33	0.020	3	33	0.020	3	33	0.040
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.240			0.240			0.480

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.000	3	33	0.000	3	33	0.000
08:00 - 09:00	3	33	0.010	3	33	0.030	3	33	0.040
09:00 - 10:00	3	33	0.010	3	33	0.010	3	33	0.020
10:00 - 11:00	3	33	0.010	3	33	0.000	3	33	0.010
11:00 - 12:00	3	33	0.000	3	33	0.000	3	33	0.000
12:00 - 13:00	3	33	0.000	3	33	0.000	3	33	0.000
13:00 - 14:00	3	33	0.000	3	33	0.000	3	33	0.000
14:00 - 15:00	3	33	0.000	3	33	0.000	3	33	0.000
15:00 - 16:00	3	33	0.030	3	33	0.010	3	33	0.040
16:00 - 17:00	3	33	0.000	3	33	0.010	3	33	0.010
17:00 - 18:00	3	33	0.010	3	33	0.000	3	33	0.010
18:00 - 19:00	3	33	0.000	3	33	0.000	3	33	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.070			0.060			0.130

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.081	3	33	0.121	3	33	0.202
08:00 - 09:00	3	33	0.232	3	33	0.455	3	33	0.687
09:00 - 10:00	3	33	0.364	3	33	0.394	3	33	0.758
10:00 - 11:00	3	33	0.222	3	33	0.283	3	33	0.505
11:00 - 12:00	3	33	0.152	3	33	0.141	3	33	0.293
12:00 - 13:00	3	33	0.172	3	33	0.182	3	33	0.354
13:00 - 14:00	3	33	0.121	3	33	0.141	3	33	0.262
14:00 - 15:00	3	33	0.283	3	33	0.182	3	33	0.465
15:00 - 16:00	3	33	0.283	3	33	0.293	3	33	0.576
16:00 - 17:00	3	33	0.162	3	33	0.273	3	33	0.435
17:00 - 18:00	3	33	0.242	3	33	0.141	3	33	0.383
18:00 - 19:00	3	33	0.253	3	33	0.121	3	33	0.374
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.567			2.727			5.294

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.040	3	33	0.091	3	33	0.131
08:00 - 09:00	3	33	0.081	3	33	0.455	3	33	0.536
09:00 - 10:00	3	33	0.152	3	33	0.162	3	33	0.314
10:00 - 11:00	3	33	0.162	3	33	0.202	3	33	0.364
11:00 - 12:00	3	33	0.121	3	33	0.192	3	33	0.313
12:00 - 13:00	3	33	0.222	3	33	0.111	3	33	0.333
13:00 - 14:00	3	33	0.091	3	33	0.091	3	33	0.182
14:00 - 15:00	3	33	0.182	3	33	0.172	3	33	0.354
15:00 - 16:00	3	33	0.424	3	33	0.182	3	33	0.606
16:00 - 17:00	3	33	0.141	3	33	0.152	3	33	0.293
17:00 - 18:00	3	33	0.364	3	33	0.253	3	33	0.617
18:00 - 19:00	3	33	0.202	3	33	0.182	3	33	0.384
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.182			2.245			4.427

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.000	3	33	0.010	3	33	0.010
08:00 - 09:00	3	33	0.000	3	33	0.081	3	33	0.081
09:00 - 10:00	3	33	0.010	3	33	0.020	3	33	0.030
10:00 - 11:00	3	33	0.000	3	33	0.000	3	33	0.000
11:00 - 12:00	3	33	0.000	3	33	0.000	3	33	0.000
12:00 - 13:00	3	33	0.000	3	33	0.000	3	33	0.000
13:00 - 14:00	3	33	0.020	3	33	0.000	3	33	0.020
14:00 - 15:00	3	33	0.010	3	33	0.010	3	33	0.020
15:00 - 16:00	3	33	0.061	3	33	0.010	3	33	0.071
16:00 - 17:00	3	33	0.000	3	33	0.010	3	33	0.010
17:00 - 18:00	3	33	0.051	3	33	0.000	3	33	0.051
18:00 - 19:00	3	33	0.010	3	33	0.000	3	33	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.162			0.141			0.303

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.000	3	33	0.010	3	33	0.010
08:00 - 09:00	3	33	0.000	3	33	0.081	3	33	0.081
09:00 - 10:00	3	33	0.010	3	33	0.020	3	33	0.030
10:00 - 11:00	3	33	0.000	3	33	0.000	3	33	0.000
11:00 - 12:00	3	33	0.000	3	33	0.000	3	33	0.000
12:00 - 13:00	3	33	0.000	3	33	0.000	3	33	0.000
13:00 - 14:00	3	33	0.020	3	33	0.000	3	33	0.020
14:00 - 15:00	3	33	0.010	3	33	0.010	3	33	0.020
15:00 - 16:00	3	33	0.061	3	33	0.010	3	33	0.071
16:00 - 17:00	3	33	0.000	3	33	0.010	3	33	0.010
17:00 - 18:00	3	33	0.051	3	33	0.000	3	33	0.051
18:00 - 19:00	3	33	0.010	3	33	0.000	3	33	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.162			0.141			0.303

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.121	3	33	0.222	3	33	0.343
08:00 - 09:00	3	33	0.323	3	33	1.020	3	33	1.343
09:00 - 10:00	3	33	0.535	3	33	0.586	3	33	1.121
10:00 - 11:00	3	33	0.394	3	33	0.485	3	33	0.879
11:00 - 12:00	3	33	0.273	3	33	0.333	3	33	0.606
12:00 - 13:00	3	33	0.394	3	33	0.293	3	33	0.687
13:00 - 14:00	3	33	0.232	3	33	0.232	3	33	0.464
14:00 - 15:00	3	33	0.475	3	33	0.364	3	33	0.839
15:00 - 16:00	3	33	0.798	3	33	0.495	3	33	1.293
16:00 - 17:00	3	33	0.303	3	33	0.444	3	33	0.747
17:00 - 18:00	3	33	0.667	3	33	0.394	3	33	1.061
18:00 - 19:00	3	33	0.465	3	33	0.303	3	33	0.768
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.980			5.171			10.151

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL LGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.010	3	33	0.000	3	33	0.010
08:00 - 09:00	3	33	0.000	3	33	0.010	3	33	0.010
09:00 - 10:00	3	33	0.010	3	33	0.010	3	33	0.020
10:00 - 11:00	3	33	0.000	3	33	0.010	3	33	0.010
11:00 - 12:00	3	33	0.010	3	33	0.010	3	33	0.020
12:00 - 13:00	3	33	0.000	3	33	0.000	3	33	0.000
13:00 - 14:00	3	33	0.000	3	33	0.000	3	33	0.000
14:00 - 15:00	3	33	0.000	3	33	0.010	3	33	0.010
15:00 - 16:00	3	33	0.010	3	33	0.010	3	33	0.020
16:00 - 17:00	3	33	0.000	3	33	0.010	3	33	0.010
17:00 - 18:00	3	33	0.010	3	33	0.000	3	33	0.010
18:00 - 19:00	3	33	0.020	3	33	0.000	3	33	0.020
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.070			0.070			0.140

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MULTI-MODAL MOTOR CYCLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	3	33	0.000	3	33	0.000	3	33	0.000
08:00 - 09:00	3	33	0.000	3	33	0.010	3	33	0.010
09:00 - 10:00	3	33	0.000	3	33	0.000	3	33	0.000
10:00 - 11:00	3	33	0.000	3	33	0.000	3	33	0.000
11:00 - 12:00	3	33	0.000	3	33	0.000	3	33	0.000
12:00 - 13:00	3	33	0.000	3	33	0.000	3	33	0.000
13:00 - 14:00	3	33	0.010	3	33	0.000	3	33	0.010
14:00 - 15:00	3	33	0.000	3	33	0.000	3	33	0.000
15:00 - 16:00	3	33	0.000	3	33	0.000	3	33	0.000
16:00 - 17:00	3	33	0.000	3	33	0.000	3	33	0.000
17:00 - 18:00	3	33	0.000	3	33	0.000	3	33	0.000
18:00 - 19:00	3	33	0.000	3	33	0.000	3	33	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.010			0.010			0.020

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Calculation Reference: AUDIT-758701-200218-0242

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	3 days
	HC	HAMPSHIRE	1 days
	HF	HERTFORDSHIRE	1 days
	KC	KENT	4 days
	SC	SURREY	2 days
	WS	WEST SUSSEX	4 days
03	SOUTH WEST		
	DV	DEVON	2 days
04	EAST ANGLIA		
	NF	NORFOLK	3 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	ST	STAFFORDSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	1 days
	NY	NORTH YORKSHIRE	3 days
	SY	SOUTH YORKSHIRE	1 days
09	NORTH		
	DH	DURHAM	2 days
11	SCOTLAND		
	FA	FALKIRK	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
Actual Range: 50 to 432 (units:)
Range Selected by User: 50 to 500 (units:)

Parking Spaces Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 23/09/19

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	8 days
Tuesday	4 days
Wednesday	8 days
Thursday	7 days
Friday	5 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	32 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	12
Edge of Town	20

This data displays the number of surveys per main location category within the selected set. The main location categories

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	32 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	2 days
5,001 to 10,000	10 days
10,001 to 15,000	10 days
15,001 to 20,000	5 days
20,001 to 25,000	3 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	5 days
25,001 to 50,000	3 days
50,001 to 75,000	3 days
75,001 to 100,000	8 days
100,001 to 125,000	2 days
125,001 to 250,000	10 days
250,001 to 500,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	6 days
1.1 to 1.5	24 days
1.6 to 2.0	2 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	10 days
No	22 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	32 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 DH-03-A-01 SEMI DETACHED DURHAM
GREENFIELDS ROAD
BISHOP AUCKLAND

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 50
Survey date: TUESDAY *28/03/17* *Survey Type: MANUAL*

2 DH-03-A-03 SEMI-DETACHED & TERRACED DURHAM
PILGRIMS WAY
DURHAM

Edge of Town
Residential Zone
Total Number of dwellings: 57
Survey date: FRIDAY *19/10/18* *Survey Type: MANUAL*

3 DS-03-A-02 MIXED HOUSES DERBYSHIRE
RADBOURNE LANE
DERBY

Edge of Town
Residential Zone
Total Number of dwellings: 371
Survey date: TUESDAY *10/07/18* *Survey Type: MANUAL*

4 DV-03-A-02 HOUSES & BUNGALOWS DEVON
MILLHEAD ROAD
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 116
Survey date: FRIDAY *25/09/15* *Survey Type: MANUAL*

5 DV-03-A-03 TERRACED & SEMI DETACHED DEVON
LOWER BRAND LANE
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 70
Survey date: MONDAY *28/09/15* *Survey Type: MANUAL*

6 ES-03-A-03 MIXED HOUSES & FLATS EAST SUSSEX
SHEPHAM LANE
POLEGATE

Edge of Town
Residential Zone
Total Number of dwellings: 212
Survey date: MONDAY *11/07/16* *Survey Type: MANUAL*

7 ES-03-A-04 MIXED HOUSES & FLATS EAST SUSSEX
NEW LYDD ROAD
CAMBER

Edge of Town
Residential Zone
Total Number of dwellings: 134
Survey date: FRIDAY *15/07/16* *Survey Type: MANUAL*

8 ES-03-A-05 MIXED HOUSES & FLATS EAST SUSSEX
RATTLE ROAD
NEAR EASTBOURNE
STONE CROSS
Edge of Town
Residential Zone
Total Number of dwellings: 99
Survey date: WEDNESDAY *05/06/19* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9 FA-03-A-02 MIXED HOUSES FALKIRK
ROSEBANK AVENUE & SPRINGFIELD DRIVE
FALKIRK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 161
Survey date: WEDNESDAY *29/05/13* *Survey Type: MANUAL*

10 HC-03-A-20 HOUSES & FLATS HAMPSHIRE
CANADA WAY
LIPHOOK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 62
Survey date: TUESDAY *20/11/18* *Survey Type: MANUAL*

11 HF-03-A-03 MIXED HOUSES HERTFORDSHIRE
HARE STREET ROAD
BUNTINGFORD

Edge of Town
Residential Zone
Total Number of dwellings: 160
Survey date: MONDAY *08/07/19* *Survey Type: MANUAL*

12 KC-03-A-03 MIXED HOUSES & FLATS KENT
HYTHE ROAD
ASHFORD
WILLESBOROUGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 51
Survey date: THURSDAY *14/07/16* *Survey Type: MANUAL*

13 KC-03-A-04 SEMI-DETACHED & TERRACED KENT
KILN BARN ROAD
AYLESFORD
DITTON
Edge of Town
Residential Zone
Total Number of dwellings: 110
Survey date: FRIDAY *22/09/17* *Survey Type: MANUAL*

14 KC-03-A-06 MIXED HOUSES & FLATS KENT
MARGATE ROAD
HERNE BAY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 363
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

15 KC-03-A-07 MIXED HOUSES KENT
RECULVER ROAD
HERNE BAY

Edge of Town
Residential Zone
Total Number of dwellings: 288
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

16 NE-03-A-02 SEMI DETACHED & DETACHED NORTH EAST LINCOLNSHIRE
HANOVER WALK
SCUNTHORPE

Edge of Town
No Sub Category
Total Number of dwellings: 432
Survey date: MONDAY *12/05/14* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

17 NF-03-A-02 HOUSES & FLATS NORFOLK
DEREHAM ROAD
NORWICH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 98
Survey date: MONDAY *22/10/12* *Survey Type: MANUAL*

18 NF-03-A-04 MIXED HOUSES NORFOLK
NORTH WALSHAM ROAD
NORTH WALSHAM

Edge of Town
Residential Zone
Total Number of dwellings: 70
Survey date: WEDNESDAY *18/09/19* *Survey Type: MANUAL*

19 NF-03-A-06 MIXED HOUSES NORFOLK
BEAUFORT WAY
GREAT YARMOUTH
BRADWELL
Edge of Town
Residential Zone
Total Number of dwellings: 275
Survey date: MONDAY *23/09/19* *Survey Type: MANUAL*

20 NY-03-A-06 BUNGALOWS & SEMI DET. NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 115
Survey date: FRIDAY *14/10/11* *Survey Type: MANUAL*

21 NY-03-A-09 MIXED HOUSING NORTH YORKSHIRE
GRAMMAR SCHOOL LANE
NORTHALLERTON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 52
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

22 NY-03-A-10 HOUSES AND FLATS NORTH YORKSHIRE
BOROUGHBRIDGE ROAD
RIPON

Edge of Town
No Sub Category
Total Number of dwellings: 71
Survey date: TUESDAY *17/09/13* *Survey Type: MANUAL*

23 SC-03-A-04 DETACHED & TERRACED SURREY
HIGH ROAD
BYFLEET

Edge of Town
Residential Zone
Total Number of dwellings: 71
Survey date: THURSDAY *23/01/14* *Survey Type: MANUAL*

24 SC-03-A-05 MIXED HOUSES SURREY
REIGATE ROAD
HORLEY

Edge of Town
Residential Zone
Total Number of dwellings: 207
Survey date: MONDAY *01/04/19* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

25 SF-03-A-07 MIXED HOUSES SUFFOLK
FOXHALL ROAD
IPSWICH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 73
Survey date: THURSDAY *09/05/19* *Survey Type: MANUAL*

26 SH-03-A-05 SEMI-DETACHED/TERRACED SHROPSHIRE
SANDCROFT
TELFORD
SUTTON HILL
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: THURSDAY *24/10/13* *Survey Type: MANUAL*

27 ST-03-A-07 DETACHED & SEMI-DETACHED STAFFORDSHIRE
BEACONSIDE
STAFFORD
MARSTON GATE
Edge of Town
Residential Zone
Total Number of dwellings: 248
Survey date: WEDNESDAY *22/11/17* *Survey Type: MANUAL*

28 SY-03-A-01 SEMI DETACHED HOUSES SOUTH YORKSHIRE
A19 BENTLEY ROAD
DONCASTER
BENTLEY RISE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 54
Survey date: WEDNESDAY *18/09/13* *Survey Type: MANUAL*

29 WS-03-A-04 MIXED HOUSES WEST SUSSEX
HILLS FARM LANE
HORSHAM
BROADBRIDGE HEATH
Edge of Town
Residential Zone
Total Number of dwellings: 151
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

30 WS-03-A-08 MIXED HOUSES WEST SUSSEX
ROUNDSTONE LANE
ANGMERING

Edge of Town
Residential Zone
Total Number of dwellings: 180
Survey date: THURSDAY *19/04/18* *Survey Type: MANUAL*

31 WS-03-A-09 MIXED HOUSES & FLATS WEST SUSSEX
LITTLEHAMPTON ROAD
WORTHING
WEST DURRINGTON
Edge of Town
Residential Zone
Total Number of dwellings: 197
Survey date: THURSDAY *05/07/18* *Survey Type: MANUAL*

32 WS-03-A-10 MIXED HOUSES WEST SUSSEX
TODDINGTON LANE
LITTLEHAMPTON
WICK
Edge of Town
Residential Zone
Total Number of dwellings: 79
Survey date: WEDNESDAY *07/11/18* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.074	32	148	0.302	32	148	0.376
08:00 - 09:00	32	148	0.116	32	148	0.373	32	148	0.489
09:00 - 10:00	32	148	0.141	32	148	0.166	32	148	0.307
10:00 - 11:00	32	148	0.123	32	148	0.159	32	148	0.282
11:00 - 12:00	32	148	0.130	32	148	0.141	32	148	0.271
12:00 - 13:00	32	148	0.160	32	148	0.146	32	148	0.306
13:00 - 14:00	32	148	0.161	32	148	0.155	32	148	0.316
14:00 - 15:00	32	148	0.163	32	148	0.184	32	148	0.347
15:00 - 16:00	32	148	0.257	32	148	0.169	32	148	0.426
16:00 - 17:00	32	148	0.279	32	148	0.161	32	148	0.440
17:00 - 18:00	32	148	0.340	32	148	0.153	32	148	0.493
18:00 - 19:00	32	148	0.290	32	148	0.169	32	148	0.459
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.234			2.278			4.512

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	50 - 432 (units:)
Survey date date range:	01/01/11 - 23/09/19
Number of weekdays (Monday-Friday):	32
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	2
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.002	32	148	0.003	32	148	0.005
08:00 - 09:00	32	148	0.004	32	148	0.003	32	148	0.007
09:00 - 10:00	32	148	0.004	32	148	0.003	32	148	0.007
10:00 - 11:00	32	148	0.002	32	148	0.002	32	148	0.004
11:00 - 12:00	32	148	0.002	32	148	0.002	32	148	0.004
12:00 - 13:00	32	148	0.003	32	148	0.003	32	148	0.006
13:00 - 14:00	32	148	0.002	32	148	0.002	32	148	0.004
14:00 - 15:00	32	148	0.003	32	148	0.003	32	148	0.006
15:00 - 16:00	32	148	0.005	32	148	0.004	32	148	0.009
16:00 - 17:00	32	148	0.003	32	148	0.004	32	148	0.007
17:00 - 18:00	32	148	0.002	32	148	0.002	32	148	0.004
18:00 - 19:00	32	148	0.002	32	148	0.002	32	148	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.034			0.033			0.067

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.001	32	148	0.001	32	148	0.002
08:00 - 09:00	32	148	0.003	32	148	0.002	32	148	0.005
09:00 - 10:00	32	148	0.003	32	148	0.002	32	148	0.005
10:00 - 11:00	32	148	0.003	32	148	0.003	32	148	0.006
11:00 - 12:00	32	148	0.002	32	148	0.002	32	148	0.004
12:00 - 13:00	32	148	0.002	32	148	0.003	32	148	0.005
13:00 - 14:00	32	148	0.003	32	148	0.001	32	148	0.004
14:00 - 15:00	32	148	0.002	32	148	0.003	32	148	0.005
15:00 - 16:00	32	148	0.002	32	148	0.003	32	148	0.005
16:00 - 17:00	32	148	0.002	32	148	0.001	32	148	0.003
17:00 - 18:00	32	148	0.001	32	148	0.001	32	148	0.002
18:00 - 19:00	32	148	0.001	32	148	0.001	32	148	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.025			0.023			0.048

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.001	32	148	0.001	32	148	0.002
08:00 - 09:00	32	148	0.000	32	148	0.000	32	148	0.000
09:00 - 10:00	32	148	0.001	32	148	0.001	32	148	0.002
10:00 - 11:00	32	148	0.001	32	148	0.001	32	148	0.002
11:00 - 12:00	32	148	0.001	32	148	0.001	32	148	0.002
12:00 - 13:00	32	148	0.000	32	148	0.000	32	148	0.000
13:00 - 14:00	32	148	0.001	32	148	0.001	32	148	0.002
14:00 - 15:00	32	148	0.001	32	148	0.001	32	148	0.002
15:00 - 16:00	32	148	0.000	32	148	0.000	32	148	0.000
16:00 - 17:00	32	148	0.000	32	148	0.000	32	148	0.000
17:00 - 18:00	32	148	0.001	32	148	0.001	32	148	0.002
18:00 - 19:00	32	148	0.000	32	148	0.000	32	148	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.007			0.007			0.014

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.004	32	148	0.009	32	148	0.013
08:00 - 09:00	32	148	0.006	32	148	0.016	32	148	0.022
09:00 - 10:00	32	148	0.000	32	148	0.004	32	148	0.004
10:00 - 11:00	32	148	0.003	32	148	0.004	32	148	0.007
11:00 - 12:00	32	148	0.003	32	148	0.004	32	148	0.007
12:00 - 13:00	32	148	0.004	32	148	0.004	32	148	0.008
13:00 - 14:00	32	148	0.003	32	148	0.001	32	148	0.004
14:00 - 15:00	32	148	0.004	32	148	0.003	32	148	0.007
15:00 - 16:00	32	148	0.008	32	148	0.005	32	148	0.013
16:00 - 17:00	32	148	0.012	32	148	0.007	32	148	0.019
17:00 - 18:00	32	148	0.012	32	148	0.007	32	148	0.019
18:00 - 19:00	32	148	0.008	32	148	0.007	32	148	0.015
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.067			0.071			0.138

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL VEHICLE OCCUPANTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.090	32	148	0.445	32	148	0.535
08:00 - 09:00	32	148	0.150	32	148	0.633	32	148	0.783
09:00 - 10:00	32	148	0.184	32	148	0.248	32	148	0.432
10:00 - 11:00	32	148	0.164	32	148	0.230	32	148	0.394
11:00 - 12:00	32	148	0.178	32	148	0.208	32	148	0.386
12:00 - 13:00	32	148	0.223	32	148	0.203	32	148	0.426
13:00 - 14:00	32	148	0.230	32	148	0.223	32	148	0.453
14:00 - 15:00	32	148	0.226	32	148	0.263	32	148	0.489
15:00 - 16:00	32	148	0.445	32	148	0.246	32	148	0.691
16:00 - 17:00	32	148	0.470	32	148	0.248	32	148	0.718
17:00 - 18:00	32	148	0.539	32	148	0.223	32	148	0.762
18:00 - 19:00	32	148	0.450	32	148	0.263	32	148	0.713
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.349			3.433			6.782

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PEDESTRIANS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.014	32	148	0.036	32	148	0.050
08:00 - 09:00	32	148	0.034	32	148	0.086	32	148	0.120
09:00 - 10:00	32	148	0.035	32	148	0.038	32	148	0.073
10:00 - 11:00	32	148	0.033	32	148	0.038	32	148	0.071
11:00 - 12:00	32	148	0.028	32	148	0.028	32	148	0.056
12:00 - 13:00	32	148	0.036	32	148	0.027	32	148	0.063
13:00 - 14:00	32	148	0.028	32	148	0.030	32	148	0.058
14:00 - 15:00	32	148	0.031	32	148	0.038	32	148	0.069
15:00 - 16:00	32	148	0.073	32	148	0.046	32	148	0.119
16:00 - 17:00	32	148	0.060	32	148	0.036	32	148	0.096
17:00 - 18:00	32	148	0.053	32	148	0.026	32	148	0.079
18:00 - 19:00	32	148	0.037	32	148	0.041	32	148	0.078
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.462			0.470			0.932

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL BUS/TRAM PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.000	32	148	0.013	32	148	0.013
08:00 - 09:00	32	148	0.001	32	148	0.018	32	148	0.019
09:00 - 10:00	32	148	0.002	32	148	0.007	32	148	0.009
10:00 - 11:00	32	148	0.004	32	148	0.004	32	148	0.008
11:00 - 12:00	32	148	0.003	32	148	0.004	32	148	0.007
12:00 - 13:00	32	148	0.004	32	148	0.005	32	148	0.009
13:00 - 14:00	32	148	0.003	32	148	0.004	32	148	0.007
14:00 - 15:00	32	148	0.004	32	148	0.003	32	148	0.007
15:00 - 16:00	32	148	0.015	32	148	0.006	32	148	0.021
16:00 - 17:00	32	148	0.014	32	148	0.004	32	148	0.018
17:00 - 18:00	32	148	0.009	32	148	0.003	32	148	0.012
18:00 - 19:00	32	148	0.013	32	148	0.003	32	148	0.016
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.072			0.074			0.146

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL RAIL PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.001	32	148	0.008	32	148	0.009
08:00 - 09:00	32	148	0.000	32	148	0.008	32	148	0.008
09:00 - 10:00	32	148	0.000	32	148	0.003	32	148	0.003
10:00 - 11:00	32	148	0.000	32	148	0.002	32	148	0.002
11:00 - 12:00	32	148	0.000	32	148	0.001	32	148	0.001
12:00 - 13:00	32	148	0.000	32	148	0.002	32	148	0.002
13:00 - 14:00	32	148	0.001	32	148	0.001	32	148	0.002
14:00 - 15:00	32	148	0.001	32	148	0.000	32	148	0.001
15:00 - 16:00	32	148	0.003	32	148	0.001	32	148	0.004
16:00 - 17:00	32	148	0.004	32	148	0.000	32	148	0.004
17:00 - 18:00	32	148	0.006	32	148	0.001	32	148	0.007
18:00 - 19:00	32	148	0.005	32	148	0.001	32	148	0.006
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.021			0.028			0.049

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL COACH PASSENGERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.000	32	148	0.000	32	148	0.000
08:00 - 09:00	32	148	0.000	32	148	0.000	32	148	0.000
09:00 - 10:00	32	148	0.000	32	148	0.000	32	148	0.000
10:00 - 11:00	32	148	0.000	32	148	0.000	32	148	0.000
11:00 - 12:00	32	148	0.000	32	148	0.000	32	148	0.000
12:00 - 13:00	32	148	0.000	32	148	0.000	32	148	0.000
13:00 - 14:00	32	148	0.000	32	148	0.000	32	148	0.000
14:00 - 15:00	32	148	0.000	32	148	0.000	32	148	0.000
15:00 - 16:00	32	148	0.000	32	148	0.000	32	148	0.000
16:00 - 17:00	32	148	0.000	32	148	0.000	32	148	0.000
17:00 - 18:00	32	148	0.000	32	148	0.000	32	148	0.000
18:00 - 19:00	32	148	0.000	32	148	0.000	32	148	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL PUBLIC TRANSPORT USERS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.001	32	148	0.021	32	148	0.022
08:00 - 09:00	32	148	0.001	32	148	0.026	32	148	0.027
09:00 - 10:00	32	148	0.002	32	148	0.010	32	148	0.012
10:00 - 11:00	32	148	0.004	32	148	0.007	32	148	0.011
11:00 - 12:00	32	148	0.004	32	148	0.005	32	148	0.009
12:00 - 13:00	32	148	0.004	32	148	0.007	32	148	0.011
13:00 - 14:00	32	148	0.004	32	148	0.004	32	148	0.008
14:00 - 15:00	32	148	0.005	32	148	0.004	32	148	0.009
15:00 - 16:00	32	148	0.018	32	148	0.007	32	148	0.025
16:00 - 17:00	32	148	0.017	32	148	0.004	32	148	0.021
17:00 - 18:00	32	148	0.015	32	148	0.004	32	148	0.019
18:00 - 19:00	32	148	0.018	32	148	0.004	32	148	0.022
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.093			0.103			0.196

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
MULTI-MODAL TOTAL PEOPLE
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	148	0.111	32	148	0.510	32	148	0.621
08:00 - 09:00	32	148	0.191	32	148	0.761	32	148	0.952
09:00 - 10:00	32	148	0.222	32	148	0.301	32	148	0.523
10:00 - 11:00	32	148	0.203	32	148	0.279	32	148	0.482
11:00 - 12:00	32	148	0.212	32	148	0.245	32	148	0.457
12:00 - 13:00	32	148	0.268	32	148	0.241	32	148	0.509
13:00 - 14:00	32	148	0.265	32	148	0.259	32	148	0.524
14:00 - 15:00	32	148	0.267	32	148	0.308	32	148	0.575
15:00 - 16:00	32	148	0.544	32	148	0.303	32	148	0.847
16:00 - 17:00	32	148	0.560	32	148	0.296	32	148	0.856
17:00 - 18:00	32	148	0.619	32	148	0.260	32	148	0.879
18:00 - 19:00	32	148	0.514	32	148	0.315	32	148	0.829
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.976			4.078			8.054

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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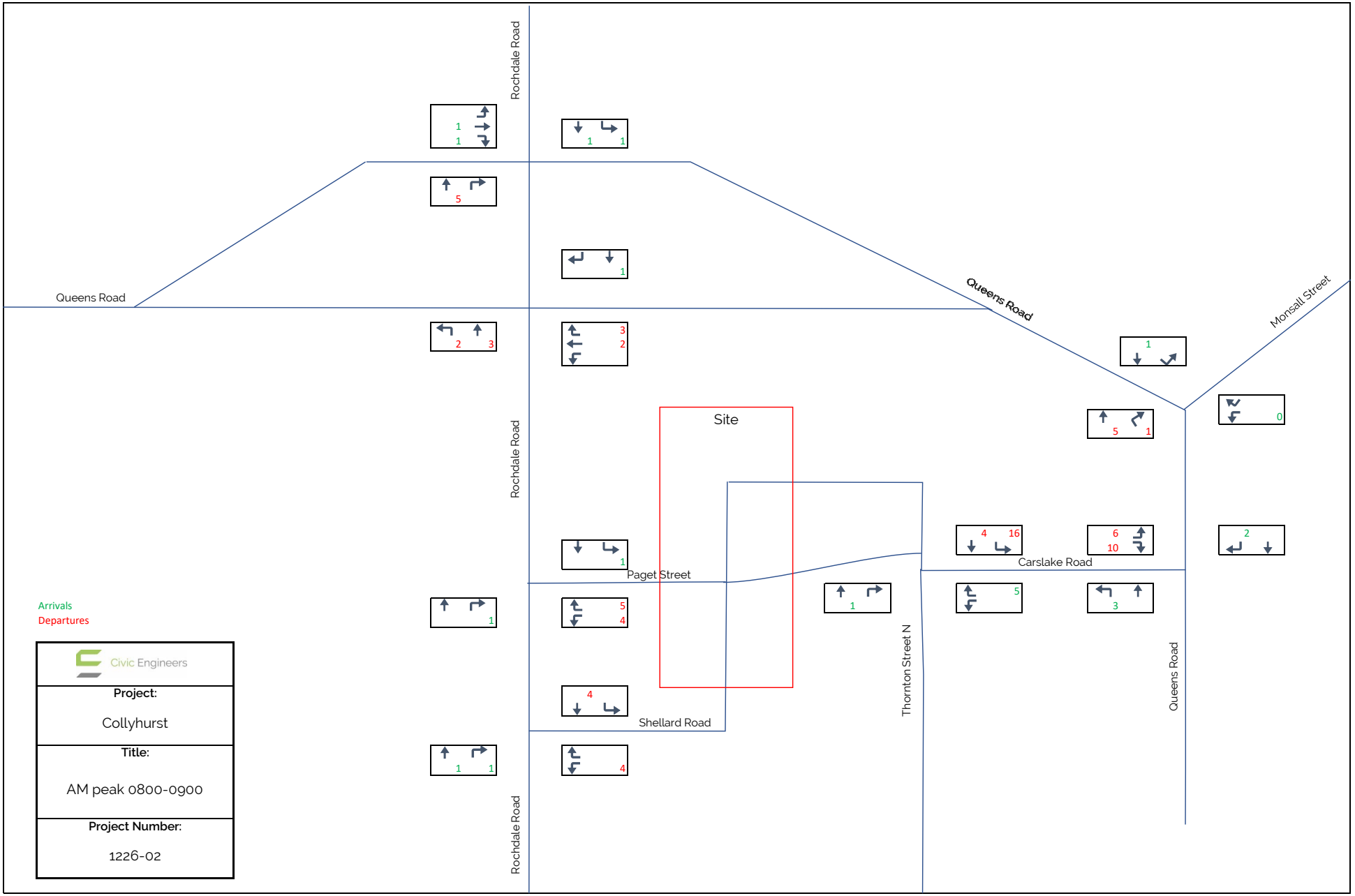
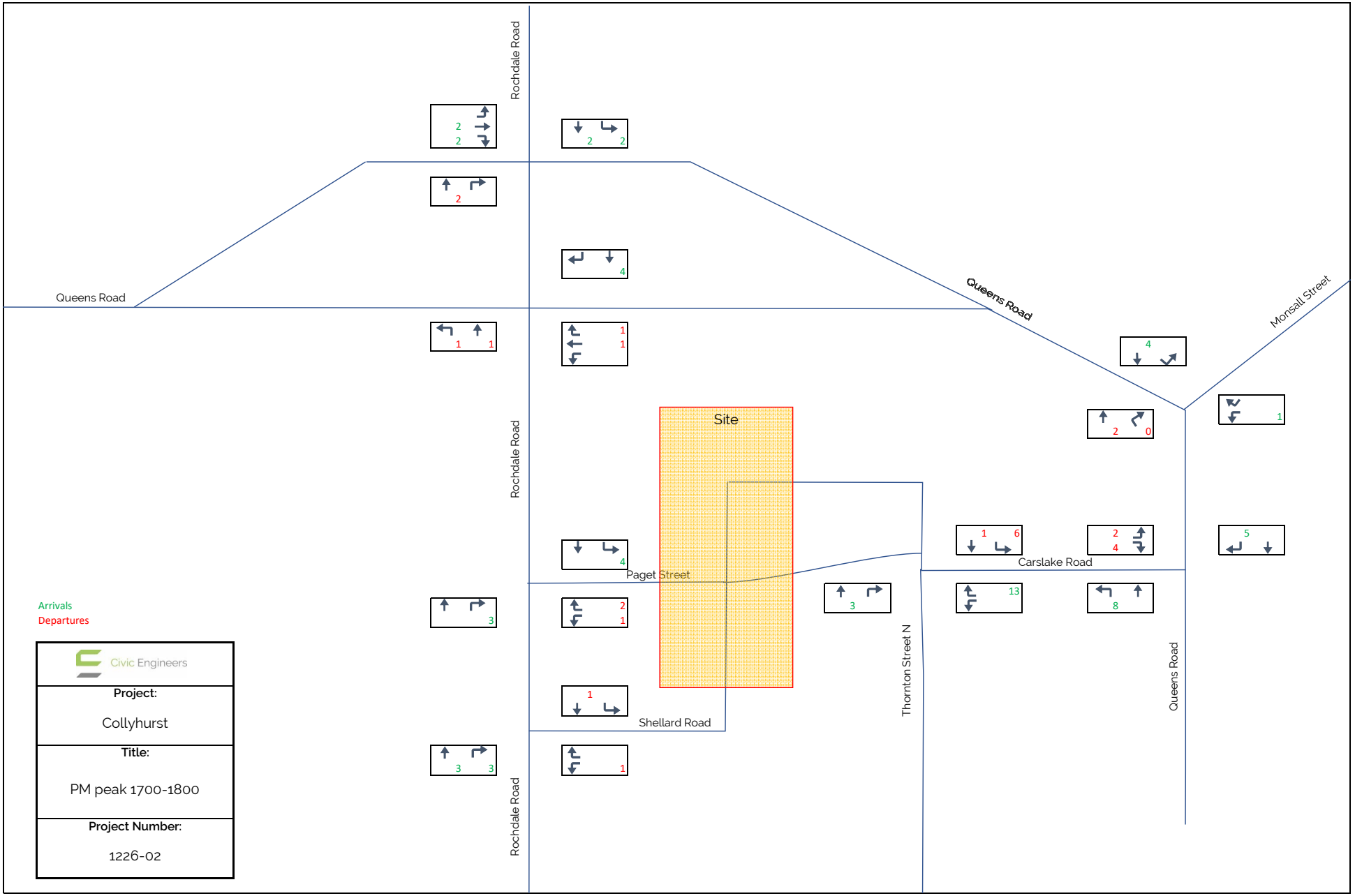
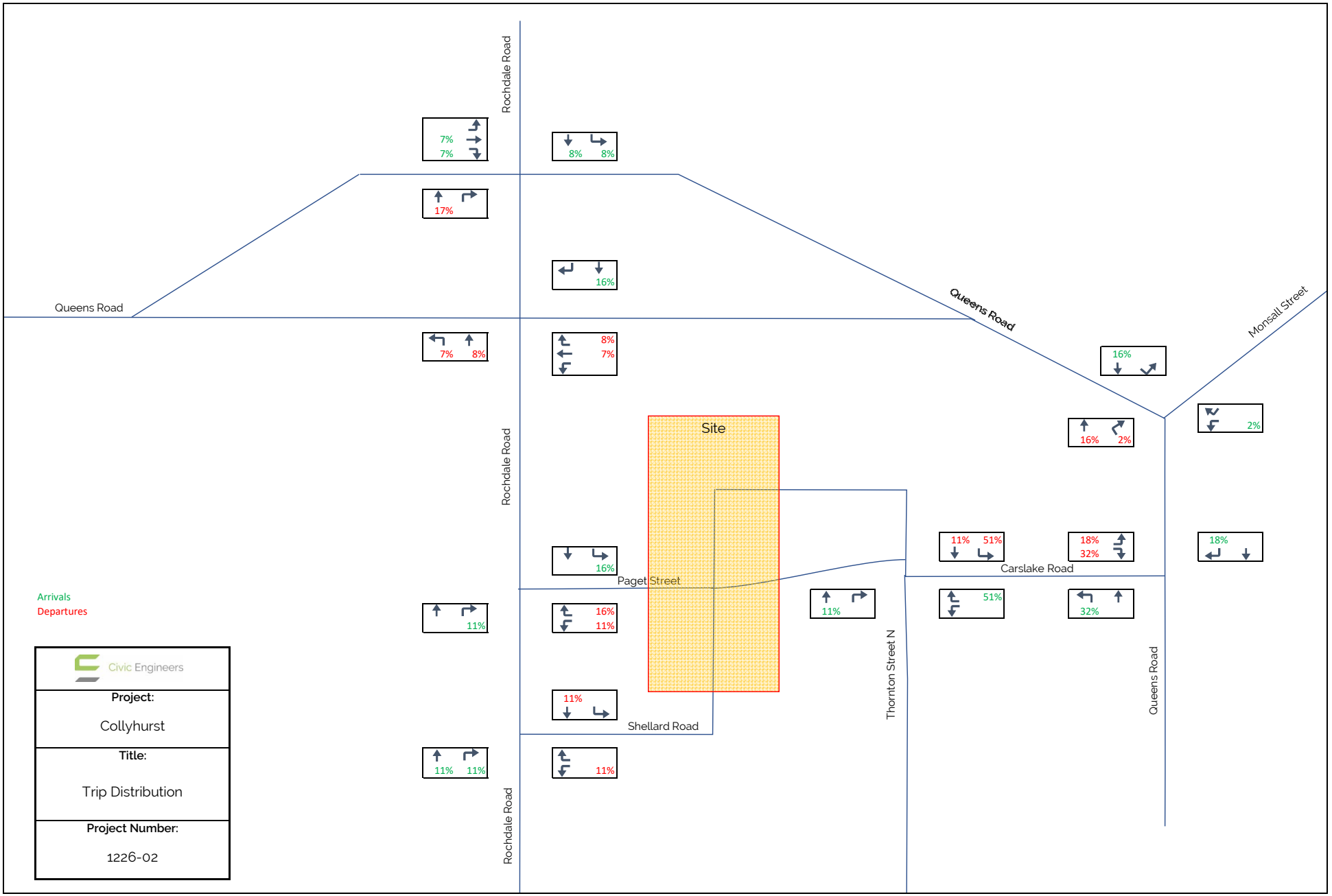
Appendix E

Traffic Flow Diagrams


Rochdale Road
Queens Road
Queens Road
Monsall Street
Site
Rochdale Road
Paget Street
Carslake Road
Thornton Street N
Queens Road
Shellard Road
Rochdale Road
Arrivals
Departures
Civic Engineers
Project:
Collyhurst
Title:
AM peak 0800-0900
Project Number:
1226-02


Rochdale Road
Queens Road
Queens Road
Monsall Street
Site
Rochdale Road
Paget Street
Carslake Road
Thornton Street N
Queens Road
Shellard Road
Rochdale Road
Arrivals
Departures
Civic Engineers
Project:
Collyhurst
Title:
PM peak 1700-1800
Project Number:
1226-02


Rochdale Road
Queens Road
Queens Road
Monsall Street
Site
Rochdale Road
Paget Street
Carslake Road
Thornton Street N
Queens Road
Shellard Road
Rochdale Road
7%
7%
8%
8%
17%
16%
7%
8%
8%
7%
16%
2%
16%
2%
16%
16%
11%
51%
18%
32%
18%
11%
16%
11%
51%
32%
11%
11%
11%
11%
11%
Arrivals
Departures
Civic Engineers
Project:
Collyhurst
Title:
Trip Distribution
Project Number:
1226-02

Civic Engineers

Job Title
Collyhurst

Report Type
Travel Plan

Prepared for
FEC Limited

Date
16 December 2020

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Travel Plan

Prepared by	**Michael Cameron**
Reviewed by	Emily Ingham
Civic Job No.	1226-02
Issued	December 2020
Revised	January 2021 – updated to include FEC comments

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1. Introduction

1.1 Commission

Civic Engineers have been commissioned by Far East Consortium Ltd (FEC) to produce this Travel Plan (TP) to accompany a planning application for a residential-led development site in the Collyhurst area of Manchester, to the north east of the city centre.

It is anticipated that this Travel Plan will provide a mechanism to promote sustainable travel patterns, manage travel demand and monitor impact. The Travel Plan will be managed by a Travel Plan Co-ordinator (TPC).

This document sets out the aims and objectives of the Travel Plan as well as suggesting specific measures to be implemented by the developer before and after completion of the development. The details of the specific Travel Plan measures will be subject to agreement with Manchester City Council (MCC) as the local planning and highway authority.

The preparation of a Travel Plan to accompany the planning application complies with local, regional, and national transport planning policy. It should be read in conjunction with the Transport Assessment (TA) which is submitted under separate cover.

1.2 Development Proposals

The development proposals contain the following:

- 244 Residential units comprised of 76 apartments and 168 houses;
- 262 sqm Commercial/communal space;
- 412 Secure, Covered Cycle Parking Spaces, 15 communal spaces in the park;
- 200 Car parking spaces; and,
- The reinstatement of Marston St in the north of the site.

1.3 Objective & Purpose

A Travel Plan is a package of measures and actions aimed at reducing the need to travel by car by providing alternative choices and encouraging walking, cycling, and public transport use.

This Travel Plan is aimed at the development team, the marketing team, and future residents of the development.

The objectives of the Travel Plan are to:

- Reduce single occupancy car journeys by residents to and from the site;
- Reduce car ownership when compared to homes in the vicinity;
- Encourage residents to travel by sustainable modes; and,

- Ensure that demand for additional car parking on site is managed such that the supply is adequate.

1.4 Content of this Travel Plan

Section 2 sets out how the Travel Plan will be managed.

Section 3 provides details of the local transport network, with Section 4 setting out what measures will be introduced at the development during construction to support sustainable journeys. It also suggests ongoing measures which will be implemented to ensure that sustainable travel choices are practical and favourable.

Section 5 provides a summary of the actions and measures required to effectively implement the Travel Plan.

2. Travel Plan Management

This section sets out how the Travel Plan will be managed across its lifetime. A summary of the required actions is provided in Table 2.

2.1 Lifespan

The Travel Plan will continue as a formal process for 5 years after first occupation, after which the responsibility for monitoring and reporting will cease.

2.2 Travel Plan Coordinator

A Travel Plan Coordinator (TPC) will be appointed by the developer and will remain in role until 5 years after first occupation. The responsibilities of the TPC are as follows:

- Delivering the actions in Table 2 and the measures in Table 3 which have 'Travel Plan Coordinator' in the responsibility column;
- Carrying out surveys and reporting on findings to MCC; and,
- Communicating the Travel Plan, including promotion of the benefits of travelling by sustainable modes, and acting as a point of contact for residents requiring information.

2.3 Liaison with Manchester City Council

This Travel Plan will be submitted to MCC to assist in determining the planning application. Thereafter the TPC will liaise regularly with MCC to discuss survey findings and best practice.

2.4 Travel Plan Targets

Targets are important for providing a measure of success of the Travel Plan. The targets are as follows:

- The maximum percentage of residents to travel to work by single occupancy car journeys will be 20%. This is based on the mode share presented in the accompanying Transport Assessment.

When this target has been met, a reduction in car use will be targeted. All targets will be agreed with MCC through the monitoring and reporting process outlined below.

2.5 Monitoring and Reporting

Annual Travel Surveys

Surveys will be carried out at the proposed development within 3 months of first occupation and will be repeated annually for 5 years.

This is an opportunity to communicate the Travel Plan to residents, to ensure they know about the range of travel options available for getting to the development and to gather feedback, e.g. the desire for more information, incentive, or cycle parking. It will also be an opportunity to monitor use of the car parking and car ownership on site.

Surveys will be emailed and/or posted to residents and a prize can be offered to encourage participation.

Annual Monitoring Reports

After the surveys each year, a Monitoring Report will be produced and sent to MCC for discussion. This will contain:

- Survey methodology and results against targets;
- Travel Plan targets for the next 12 months;
- Qualitative feedback;
- An analysis on the effectiveness of the Travel Plan;
- Uptake and success of the Travel Plan measures; and,
- Details of car and cycle parking use.

3. Local Transport Context and Access to the Development

This section describes the site and considers the existing conditions on the surrounding highway network for all available modes.

3.1 Site Location

The site located in the Collyhurst region of the city, approximately 2.4km to the northeast of the city centre. It is bound by a wooded area and the East Didsbury to Rochdale tram line to the North, Thornton Street North and Anslow Close to the East, Shellard Road to the South and Rochdale Road to the West. The surrounding area is predominantly residential. The site location is shown in Figure 1.

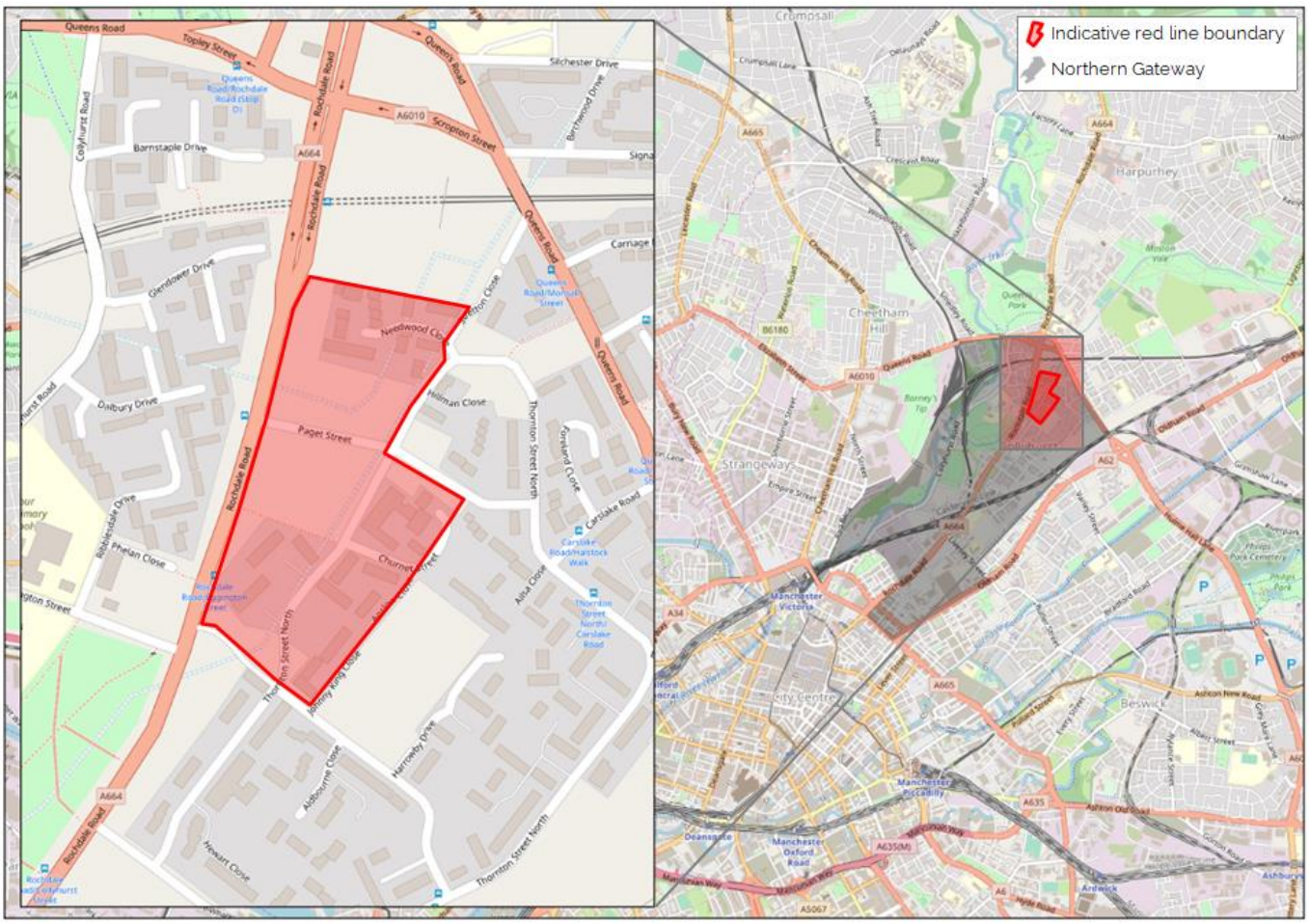

Figure 1: Site Location

3.2 Existing Land Use

The site is a vacant brownfield land that was previously a housing development that has mostly been demolished, there is still a shop and some dwellings on the site and the rest of the land is now mostly scrub land with some streets and footpaths remaining.

3.3 Pedestrian Access

The site is accessible from all directions by pedestrians. Rochdale Road has 3-3.5m footways along either side with controlled crossing points at various points along its length. The nearest controlled crossing to the site is approximately 40m south of Paget Street, there is another 50m to the south of Shellard Street and another at the junction of Rochdale Road and the A6010 about 130m to the north

of the site. Rochdale Road has streetlighting along its length and informal crossings with dropped kerbs at junctions with side roads, some of which have tactile paving. The other streets in and around the site have 1.8m footways either side with dropped kerbs and tactile paving at the crossing points. The junction of Thornton Street North and Paget Street benefits from having a raised table meaning that there are no level changes at the crossing points, and it provides traffic calming measure at the same time.

To the east of the site there are a network of footpaths through the existing residential area. These provide access to Queens Road where there are controlled crossings for access to a convenience store and chemist as well as Monsall Street that leads to Monsall tram stop.

Some of the streets and footways have been resurfaced, where this is the case they are in good condition, in other places the footways are uneven and, in some places, overgrown.

The desirable, acceptable, and preferred maximum walking distances for commuting or trips associated with school are 500m, 1km and 2km, respectively[1]. Figure 2 shows these isodistances.

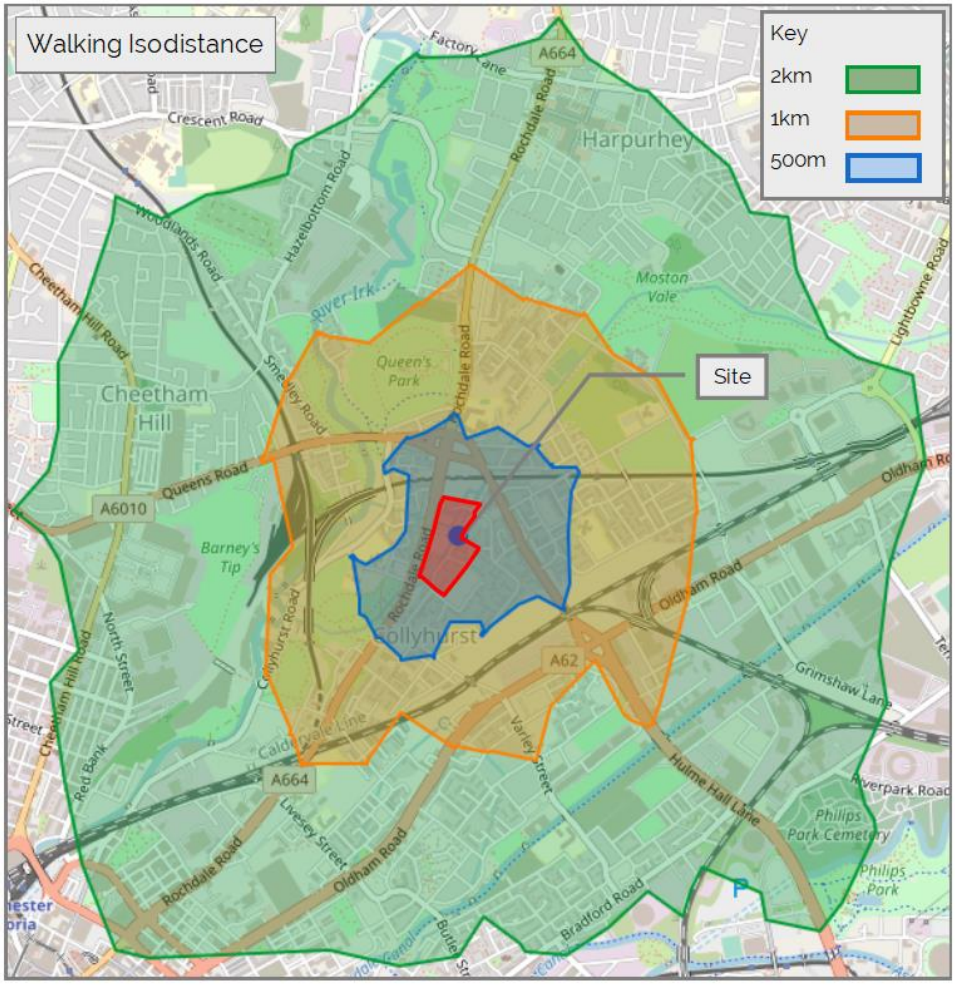

Figure 2: Walking Isodistances

[1] Guidelines for Providing for Journeys on Foot, Institution of Highways and Transportation, 2000

A good provision of local amenities within a 20-minute walk is the subject of the aptly named '20-minute neighbourhood' movement[2]. The amenities within walking distance of the development indicate that many daily needs can be satisfied on foot, Figure 3 contains the education and healthcare services that are within 20-minutes of the development site. Also within this distance are parks and shops.

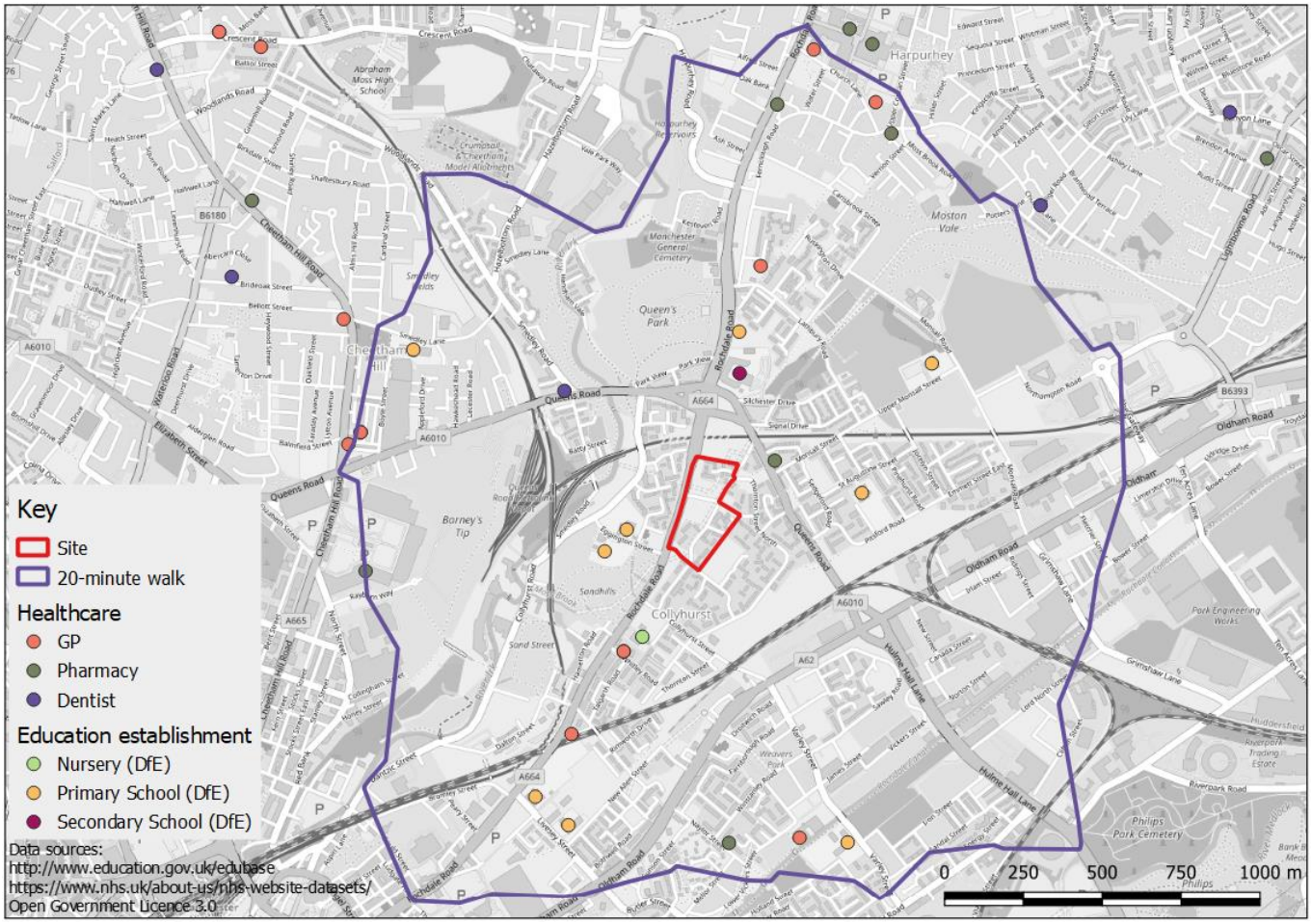

Figure 3: 20-minute neighbourhood

With an interlinked network of pedestrian routes in and around the site, it is concluded that the site is well located for access on foot.

3.4 Cycle Access

Figure 4 illustrates that there are a number of dedicated cycle facilities around the site including on-road routes along Rochdale Road shared with a bus lane in the northbound direction and only for a short distance southbound from the junction with the A6010.

Along Queens Road the cycle facilities are on road to the south of Carslake Road and shared with the pedestrian footway further north. These facilities form a section of the National Cycle Route (NCR) 60

[2] Z, P. (2015) The 20 Minute Neighbourhood. *The Culture Vulture.* [online] Available at: https://theculturevulture.co.uk/all/the-20-minute-neighbourhood/ (Accessed 14 October 2020)

which runs between Sale water park to the south west of Manchester city centre and Harpurhey just to the north of Collyhurst. Many of the streets within the site are subject to a 20mph speed limit, so although they do not have specific cycle infrastructure the traffic speed is low enough that a confident cyclist could use any of these streets to get around. To cycle to the city centre there are incomplete cycle facilities along the length of Rochdale Road or there is a route along Collyhurst Road to the west that is signposted but with no facilities.

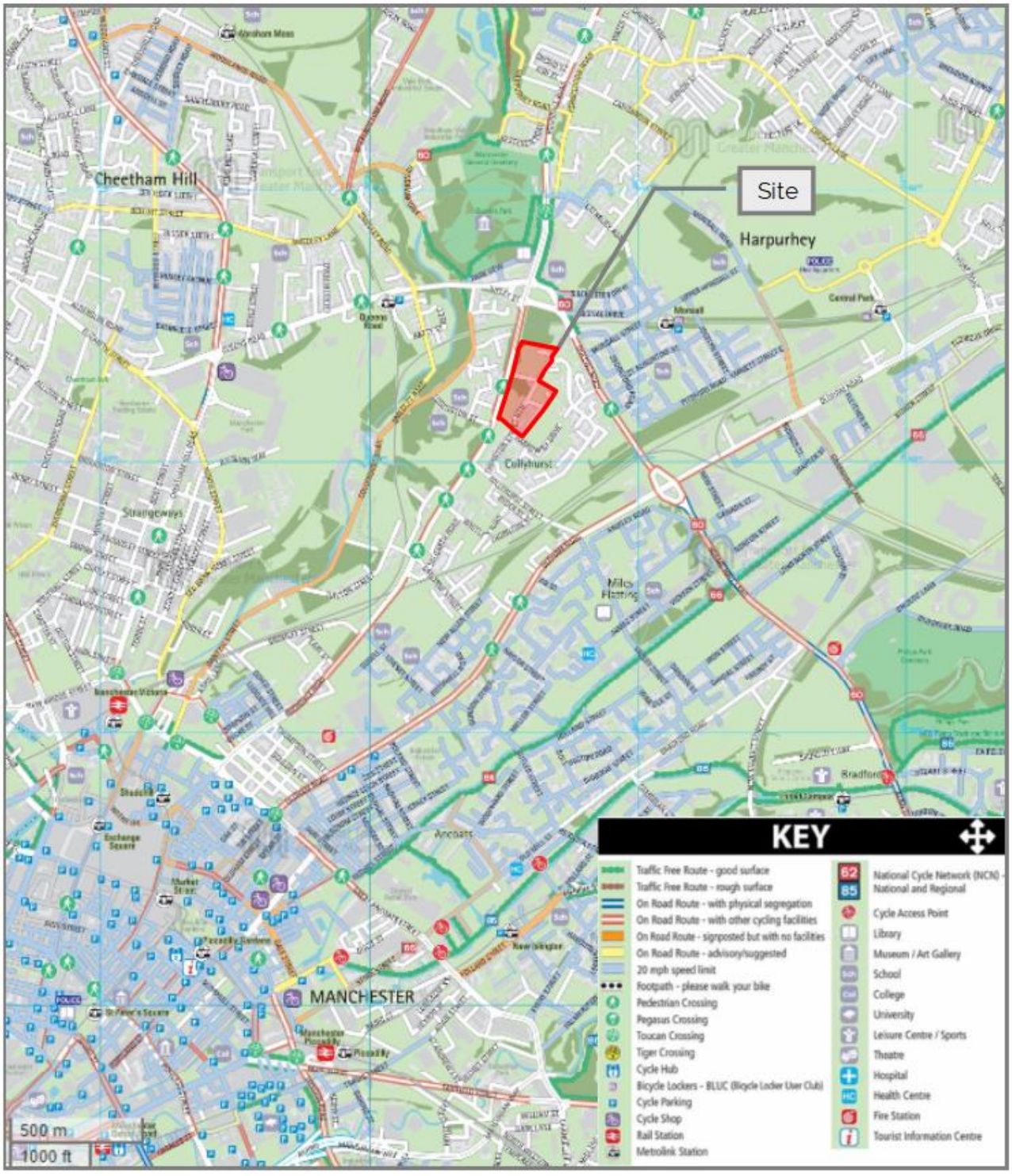

Figure 4: Extract from TfGM Cycle Route Map

Transport for Greater Manchester (TfGM) are working to develop the 'Bee Network', a 1,800 mile network of walking and cycling routes that will connect neighbourhoods and give people within the communities to have a genuine choice about the way they make short journeys[3]. The Website: http://cycling.tfgm.com/ gives more information on upcoming events and cycling initiatives within Greater Manchester, including the Bee Network, which will see £160M invested in walking and cycling routes.

Proposed and confirmed infrastructure associated with the Bee Network near to the site are shown in Figure 5. They include a 'busy beeway' on Rochdale Road, 'beeways' on Shellard Road, Thornton Street North, Carslake Road, and Monsall Street. There are also proposed improvements to crossing points at the junctions on Queens Road with Monsall Street, Carslake Road, and Sedgeford Road as well as crossings on Rochdale Road at Shellard Street and Scropton Street[4].

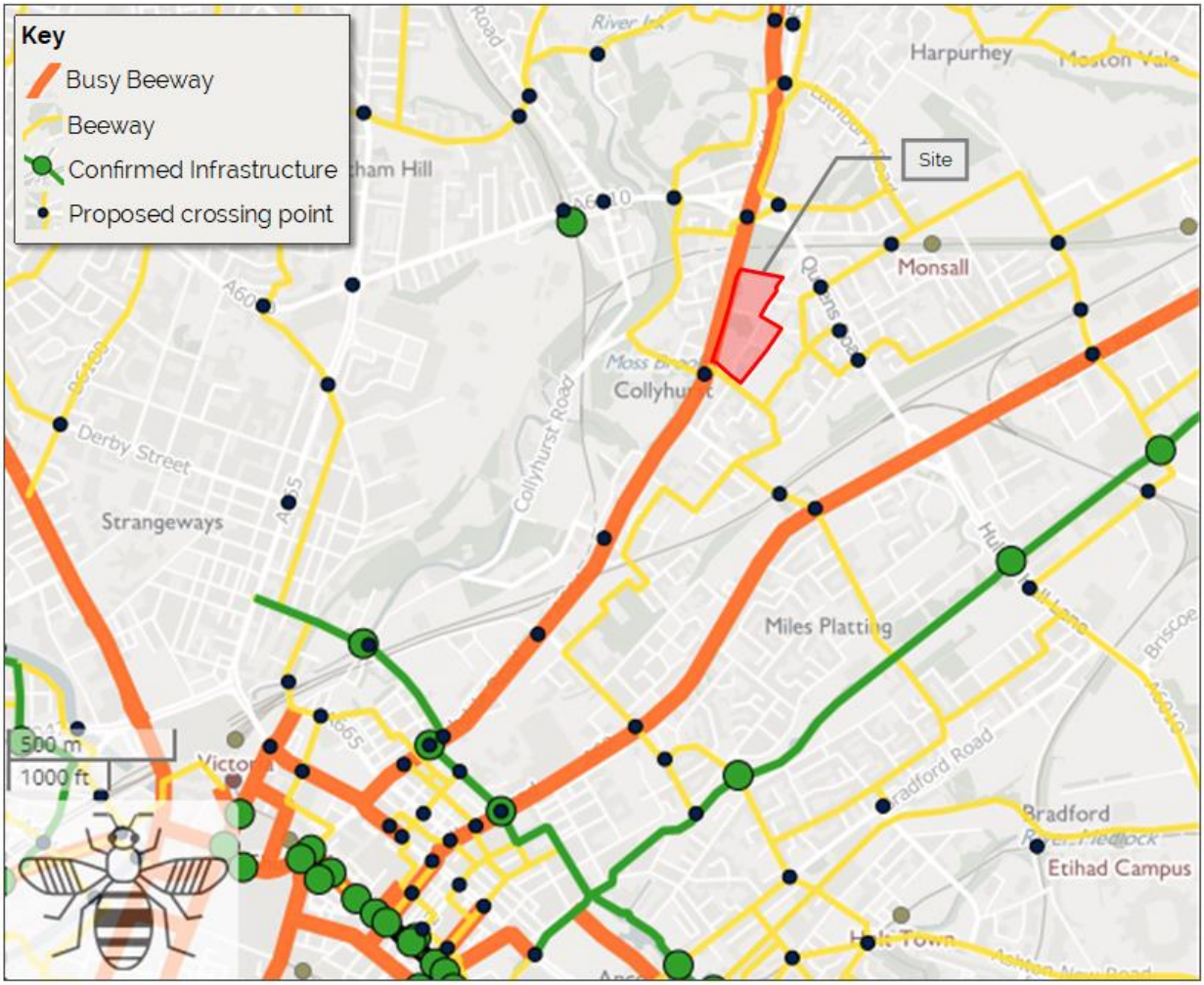

Figure 5: Bee network proposals

[3] Change a region to change a nation 2020.
https://assets.ctfassets.net/nv7y93idf4jq/Xx5s7azQY1SYmdNKIAviX/e4395ab029410907365cd0962d17bf81/19-1950_Bee_Network_delivery_plan-style_-_website_version.pdf
[4] Bee Network Map https://mappinggm.org.uk/bee-network/ (accessed 6 October 2020)

Figure 4 illustrates a 30-minute cycle isochrone around the site, equivalent to approximately 8km. This indicates that people living at the development could reach all of Manchester City Centre, Salford, including Salford Quays as well as the University of Manchester and Manchester Royal Infirmary to the south of the city centre in a reasonable cycle commute to work or study.

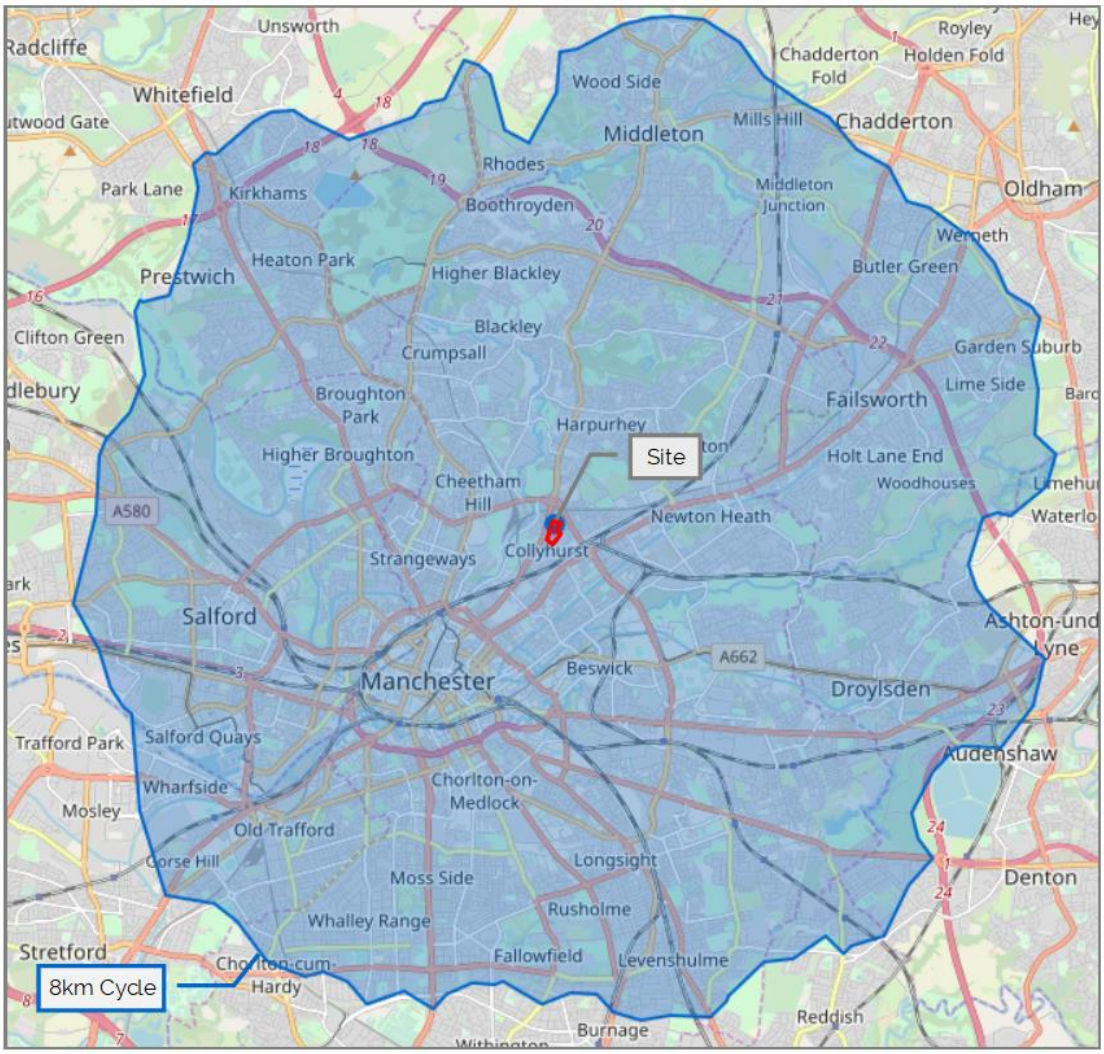

Figure 6: Cycling Isochrone

The site is very well located for access by bicycle.

3.5 Bus Access

Figure 7 shows the locations of the bus stops nearest the site.

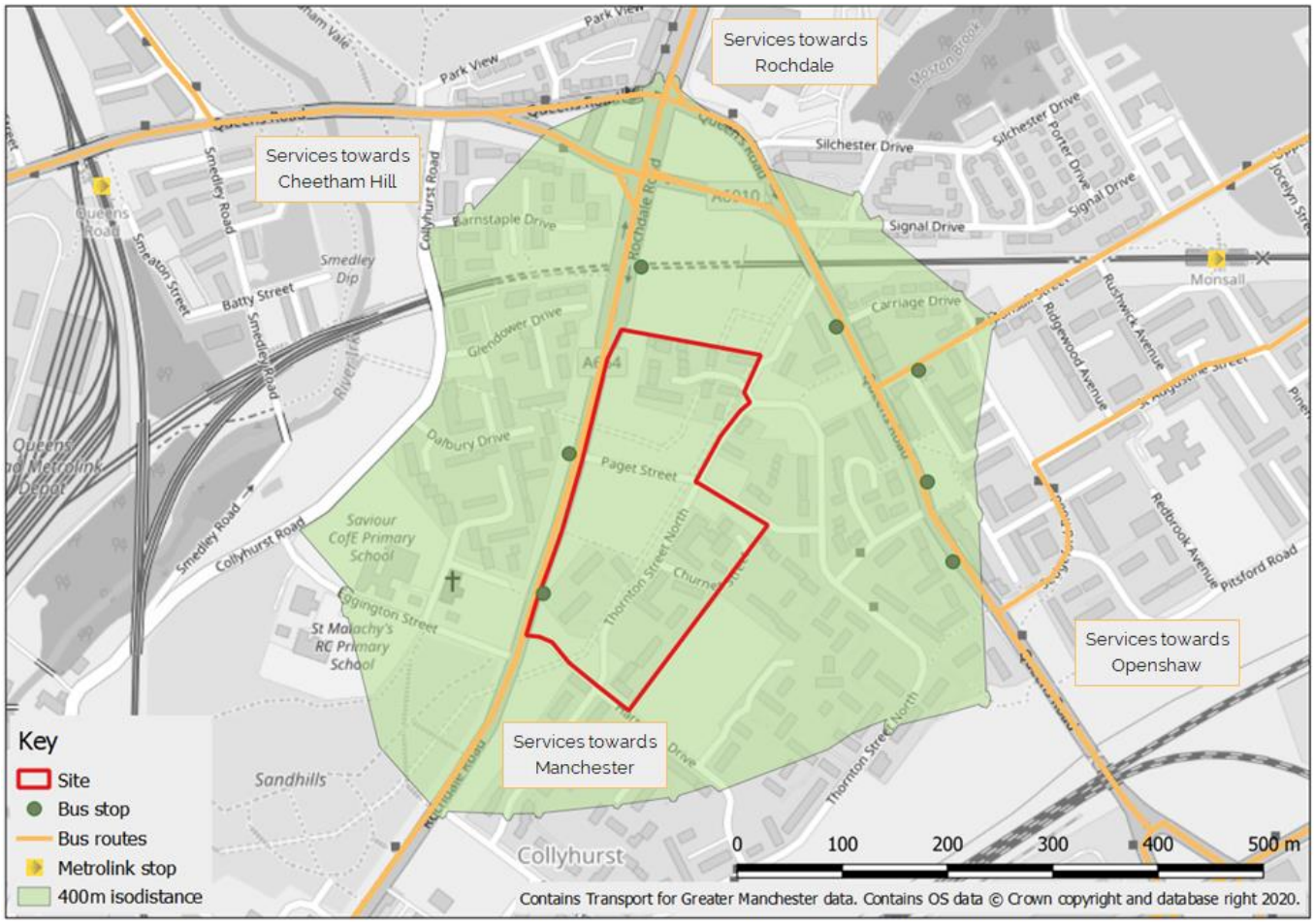

Figure 7: Public transport options near the site

Table 1 (overleaf) sets out a summary of the most regular services calling at the stops on Rochdale Road and Queens Road, with the services stopping on Rochdale Road in **bold**.

Table 1: Local bus services and their frequency

Service	Route	Frequency (minutes)			
		Monday - Saturday		Sunday	
		Daytime	Evening	Daytime	Evening
17	Manchester - Collyhurst - Blackley - Middleton - Castleton - Rochdale	10	10	15	30
18	Langley — Middleton — Manchester — Manchester Royal Infirmary	10	10	15	30
53	Cheetham Hill - Gorton - Rusholme - Old Trafford - Salford Quays - Pendelton	30	60	60	60
56	Manchester - NMGH - Manchester circular	30	-	-	-
81	Manchester - Collyhurst - Moston - Werneth - Oldham - Derker	30	60	60	60
112/113	Middleton – Moston – Collyhurst – Piccadilly Gardens	15	20	30	30
114	Manchester - Collyhurst - Moston - Alkrington - Boarshaw	20/30	60	60	60
117	Greengate - Moston – Collyhurst – Piccadilly Gardens	30	-	60	-
118	Boarshaw - Moston – Collyhurst – Piccadilly Gardens	15	15	30	60
119	N. Manchester General Hospital – Moston – Piccadilly Gardens	30	30	60	60
151	Hollinwood - Failsworth - Collyhurst - NMGH - Cheetham Hill - Mandley Park	60	-	-	-
156	Middleton – Rhodes – N. Manchester General Hospital – Shudehill Interchange	30	30	60	60
162/163	Norden/Bury - Heywood – Middleton – Collyhurst - Piccadilly Gardens	10	20	15	60

The information in Table 1 is correct at the time of writing (December 2020), however, many services are operating on temporary timetables in response to Covid-19 and as such may not be representative of 'normal' operations. As such this information should be checked and updated when appropriate.

Table 1 and Figure 7 show that the site is well located to access bus services, with the nearest stops adjacent the site. Approximately 32 services per hour travel along Rochdale Road, an additional five services per hour can be accessed from the stops on Queens Road. Some of the services that operate at a 10-minute frequency state that this is the minimum frequency during peak hours, therefore there are often more than six buses per hour for these services.

The stops on Rochdale Road have shelters and seating for passengers to use while waiting for the bus. There is no real-time-information at these stops, but they do have timetable information displayed. The northbound stop on Queens Road has a shelter, seating, and timetable information whereas the southbound stop has timetable information but no shelter or seating.

3.6 Metrolink

The closest Metrolink stop to the site is Monsall, which is located approximately 600m to the east of the site. Monsall is served by the pink Metrolink line, providing services between Rochdale and East Didsbury via the city centre, connections can be made at Victoria or Cornbrook for services covering the entire network. There are 15 spaces for cycle storage at this stop, five stands (10 cycles) and five lockers.

Another stop near to the site is Queens Road, approximately 700m from the northwest of the site. Queens Road is served by the yellow Metrolink line which offer services between Bury and Piccadilly. There are five cycle stands at this stop, enough to accommodate 10 cycles.

Services on all lines run 06:00-00:00 Monday to Saturday; from 06:00-19:00 Monday to Friday and 08:00-20:00 Saturday trams run at 10-minute intervals, at other times there is a 20-minute service. On Sunday, a 15-minute service runs from 07:00-23:00. Metrolink is currently (December 2020) operating a reduced service in response to the Covid-19 pandemic and these times should be reviewed when appropriate.

3.7 Rail

The nearest train station to the development is Manchester Victoria Station located approximately 2km (as the crow flies) to the southwest of the site. The station can be reached on foot in about 30 minutes, by bike in around 10 minutes, or by bus in about 15 minutes.

Manchester Victoria Station is the city's second largest mainline station and home to one of the nine Metrolink stops within the City Zone. The station hosts local and regional services to destinations such as Leeds, Newcastle, Liverpool, Rochdale and Huddersfield, operating across 6 platforms.

The station is staffed between the hours 0630 – 2200 Monday to Saturday and 0800 – 2215 on Sundays. The station benefits from both a ticket office and ticket machines with ticket barriers. Cycle storage is available within the station (38 cycle stands). Refreshment facilities and toilets are also available.

The site is approximately 2.5km (as the crow flies) from Manchester Piccadilly, 10 minutes by bike or about 25 minutes by public transport. The city's largest mainline station has regular services to national destinations such as London, Birmingham, Sheffield, Leeds and Glasgow, as well as frequent connections to Manchester Airport and many stations within the wider Manchester area.

3.8 Local Highway Network

Rochdale Road along the western boundary of the development is a strategic radial route into and out of Manchester city centre. The carriageway is three lanes wide adjacent to the site, one lane in

each direction for general traffic and a northbound bus lane (7am-7pm 7-days a week). To the north it widens to six lanes at the junction with Queens Road to accommodate turning lanes and then is four lanes wide to the north of this junction. It has streetlights and a 30mph speed limit. It provides access to the M60 at junction 20 as well as passing through suburban north Manchester. Toward the city centre it provides a connection with the Manchester ring road which connects with all the radial routes around the city, one of which is the M602 leading to the M60, M62, and M6.

Queens Road A6010, to the east of the site is a local strategic route through the north of Manchester. Queens Road connects with Oldham Road to the south and with Cheetham Hill Road to the west.

Roads in the area have a 30mph speed limit and many of the residential streets in the surrounding area have 20mph speed limits.

3.9 Car Parking

Car parking is provided for the residents in the surrounding area either in the form of parking courts near the houses or on street parking. There are no parking restrictions in the area (except for at junctions).

4. Development Details & Travel Plan Measures

This section sets out the development proposals for the site, looking at each available travel mode in turn to demonstrate how the proposals will support sustainable travel choice. The measures are summarised in Table 3.

4.1 Proposals

The development proposals contain the following:

- 244 Residential units comprised of 76 apartments and 168 houses;
- 262 sqm Commercial/communal space;
- 412 Secure, Covered Cycle Parking Spaces, 15 communal spaces in the park;
- 200 Car parking spaces; and,
- The reinstatement of Marston St in the north of the site.

The proposed ground floor layout, which shows the locations of the bin stores, cycle stores and pedestrian access points is included within Appendix A.

4.2 Communication Strategy

The following sections set out how the development will be accessed by all available modes. When people move to a new house, there is an opportunity for travel behaviour to change. It is therefore vital that measures to support active travel options are communicated and promoted to potential residents when they first show an interest in the development.

Suggested Travel Plan communication strategy

- Sales and marketing information will refer to the Travel Plan measures that will be made available to residents and will include engagement about only using allocated parking spaces throughout the development.
- Travel information will be issued to resident upon completion of their purchase and before they move in, including information about transport options, Travel Plan measures, and parking information.
- Ongoing communication with residents about the sustainable travel and initiatives.

4.3 Pedestrian & Cycle Access

The development has been designed to provide a pleasant environment for people to live in and walk through with pedestrians and cyclists able to access the site from all directions. There is a footway surrounding the perimeter of the site and all streets within the site have footways on either side. There are streets that have no through route for vehicles but do have footways to connect through the site. Between the blocks of housing there is a network of footways that connect through the site and provide direct access from parking areas to the gardens. In some instances, these are gated and provide access for residents only rather than the general public, for example the access by the bus stop on Rochdale Road. The parking areas and internal streets have a different surface type to the surrounding streets and footways to encourage slower vehicle speeds and make these areas for

pedestrian movement as well as vehicle movement. There is a segregated cycle route for people travelling southbound on Rochdale Road adjacent to the site.

Pedestrian and cycle access routes through the site are shown in Figure 8.

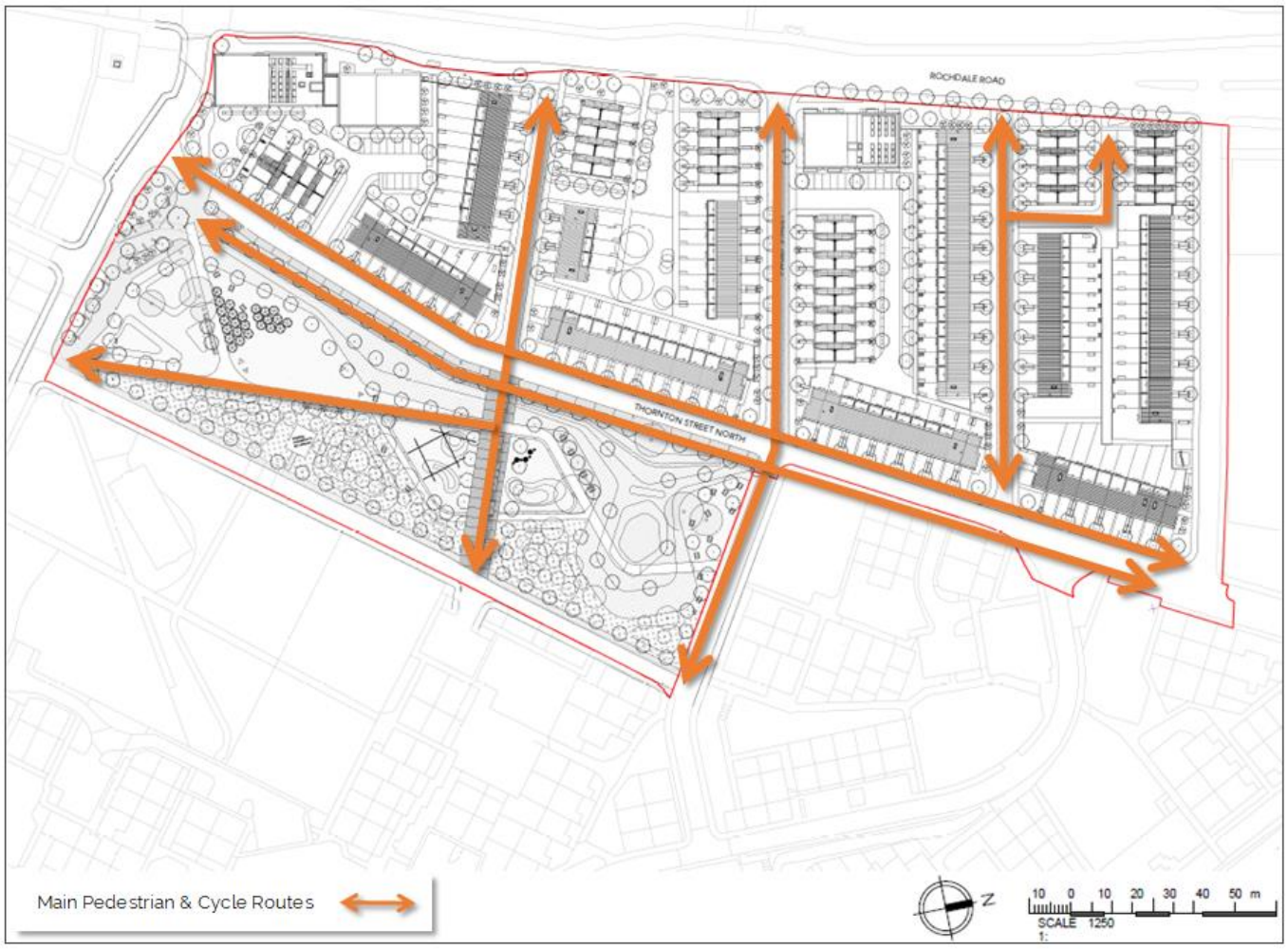

Figure 8: Pedestrian and cycle access

Measures to support journeys on foot:

- Permeability through the site with numerous pedestrian routes through the development for residents and local residents;
- Using continuous footways at junctions in the development to calm traffic and provide a more pleasant environment to walk in; and,
- Use of different surface materials to encourage low traffic speeds on the internal streets and in parking courts.

4.4 Cycle Parking

412 cycle parking spaces will be provided in secure cycle stores located within gardens or driveways of the houses and in secure indoor stores on the ground floor with direct access from the street for the apartments, which is in accordance with Manchester City Council guidelines[5]. A further 15 spaces will be provided for communal use within the park landscaping.

Measures to support journeys by cycle:

Cycle friendly streets achieved using different surface materials to encourage slower vehicle speeds and no through routes for vehicles.

4.5 Public Transport Access

Residents of the proposed development will be able to access the development using existing public transport services. As noted in Section 3, the site has been assessed by TfGM as having a very good public transport accessibility level, rated 8, the highest rating on the Greater Manchester Accessibility Level scale. The Monsall Metrolink stop around 600m to the northeast and bus stops adjacent to the site on Rochdale Road where there are frequent services to Manchester city centre.

Measures to support journeys by public transport

- Improved pedestrian access to bus stops on Rochdale Road by providing quality pedestrian routes through the site for residents and the local community; and,
- TPC could explore the provision of discounted/free public transport tickets.

4.6 Vehicle Access and Parking

Vehicle access to the site from Rochdale Road is either via Paget street, Shellard Road, or the reinstated Marston Street to the north of the site. Access from Thornton Street North can be from Paget Street but also directly into the site via two new (unnamed) streets that provide access to the communal parking courts and to some of the houses. The intention is for these new streets to be adopted by MCC, a plan for adoption can be found in the accompanying TA.

200 car parking spaces will be provided on-site, one space for every house provided on driveways and 0.25 spaces per apartment. 50% of the houses will have EV charging installed, with the remaining having the infrastructure to enable instalment in the future. 10% of the spaces in the communal parking (3 spaces) will have EV charging. Parking for the houses is located within the curtilage of each property as a driveway while others are in communal parking courts located in the centre of the blocks. The apartment car parking will be secured by drop bollards and letting/allocation of the spaces will be managed by the social rent RP (MCC). 8 visitor spaces are located within the living streets.

[5] Manchester Residential Quality Guidance 2017 (accessed 20 Oct 2020)
https://www.manchester.gov.uk/downloads/download/6682/residential_quality_guide

There are also approximately 28 spaces provided on the east side of Thornton Street North which can be used for visitor parking. Furthermore, there is an opportunity for a car club space to be designated in one of the on-street spaces to further encourage residents to use private vehicles less.

Measures to reduce car use and the impact of car journeys:

- Sustainable travel modes promoted and supported;
- Discussion with Enterprise Car Club regarding a vehicle being located at the development If a vehicle can be located at the development, funding would be made available for residents to join and use Enterprise Car Club for a period;
- Encourage car sharing among residents, through a platform such as Hiya Car; and,
- Provision of EV charging infrastructure at every house and for 10% of the apartment parking spaces.

5. Summary of Travel Plan Actions & Measures

Travel Plan actions and measures are summarised in Table 2 and Table 3 and will be in place for the lifetime of the Travel Plan.

Table 2: Summary of Travel Plan actions

Action	Responsibility	Timeframe
Appoint a Travel Plan Coordinator	Developer	Travel Plan Coordinator to be in role prior to first marketing of the development and for 5 years after first occupation
Implement Travel Plan measures	As per Table 3	As per Table 3
Carry out annual travel surveys, target of less than 20% of residents travelling to work by single occupancy car	Travel Plan Coordinator	Surveys to start 3 months after first occupation and continue annually for 5 years
Produce a Monitoring Report each year to review the effectiveness of the Travel Plan	Travel Plan Coordinator	Produce Monitoring Report within 2 months of the end of the survey period each year

Summary table of measures overleaf.

Table 3: Summary of Travel Plan measures

Measure	To Support	Responsibility	Implementation
Travel Information provided to prospective residents in marketing information, to promote all sustainable options for accessing the site, the travel plan measures that will be on offer to residents and details of car parking.	Sustainable travel choice	Travel Plan Coordinator	Information available in time for marketing first units
Travel information provided to residents when they move in via welcome information, which should include: • Promotion of walking routes to local amenities and leisure routes; • Cycling routes towards the city centre, local amenities, and leisure routes; • Bus and tram timetable, stop, and route information; and, • Car Club concept, locations, and funding for membership.	Sustainable travel choice	Travel Plan Coordinator	Information available in time for marketing first units
Ongoing communication about the Travel Plan	Sustainable travel choice	Travel Plan Coordinator	Ongoing
Pedestrian permeability through the site and connections to surrounding areas and leisure routes	Walking	Developer	Construction
Using continuous footways at junctions across the scheme to naturally calm traffic and provide a more pleasant environment to walk in	Walking	Developer	Construction
Use of different surface materials to encourage low traffic speeds on the internal streets and in parking courts.	Walking	Developer	Construction
Provision of adequate, accessible, secure cycle parking for residents	Cycling	Developer	Construction
Provision of cycle friendly streets, achieved by using different surface materials to encourage slower vehicle speeds no through route for vehicles	Cycling	Developer	Construction

Measure	To Support	Responsibility	Implementation
Improved pedestrian access to bus stops on Rochdale Road by providing quality pedestrian routes through the site for residents and the local community	Public Transport	Developer	Construction
Explore the provision of discounted/free public transport tickets	Public Transport	Travel Plan Coordinator	In time for first occupation
Discussion with Enterprise Car Club regarding a vehicle being located at the development. If a vehicle can be located at the development, funding would be made available for residents to join and use Enterprise Car Club for a period.	Reducing impact of car use	Developer	In time for first occupation
Encourage car sharing among residents, through a platform such as Hiya Car	Reducing impact of car use	Travel Plan Coordinator	Ongoing
Provision of EV charging infrastructure at every house and for 10% of the apartment parking spaces	Reducing impact of car use	Developer	Construction

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Air Quality Environmental Impact Assessment

Appendix 10.1 - Assessment Input Data

Land at Collyhurst, Manchester

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1.1 Introduction

1.1.1 The proposed development has the potential to cause air quality impacts as a result of vehicles travelling to and from the site. In order to assess nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than 10µm (PM_{10}) and particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$) concentrations at sensitive locations, detailed dispersion modelling was undertaken in accordance with the following methodology.

1.2 Dispersion Model

1.2.1 Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0.0.1). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and Department for Environment, Food and Rural Affairs (DEFRA).

1.2.2 The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length (z_0); and,
- Monin-Obukhov length.

1.2.3 These are detailed in the following Sections.

1.3 Assessment Area

1.3.1 The assessment area was defined based on the site location and anticipated vehicle trip distribution from the development. Ambient concentrations were predicted over National Grid Reference (NGR): 385240, 399980 to 385930, 400670. One Cartesian grid was used

within the model to produce data suitable for contour plotting using the Surfer software package.

1.3.2 Reference should be made to Figure 10.10 in Appendix 10.2 for a map of the assessment area.

1.4 Traffic Flow Data

1.4.1 Baseline traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition as Heavy Duty Vehicle (HDV) proportion, was provided by Civic Engineers, the Transport Consultants for the project.

1.4.2 Traffic data for several roads was not available. As such, information for these links was obtained from the Department for Transport (DfT)[1]. The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 1999 to 2019. It should be noted that the DfT web tool is referenced in DEFRA guidance[2] as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

1.4.3 The baseline DfT traffic data was converted to the site opening year utilising a factor obtained from TEMPro (version 7.2). This software package has been development by the DfT to calculate future traffic growth throughout the UK.

1.4.4 Development trip generation rates and associated distribution for the DfT links were provided by Civic Engineers. These movements were added to the baseline data to provide an estimation of traffic flows with the development in place.

1.4.5 A summary of the traffic flow data is provided in Table A10.1.1.

[1] http://www.dft.gov.uk/traffic-counts/.

[2] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Table A10.1.1 Traffic Data

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)
		Verif.	2023 DM	2023 DS	
L1	A664, Rochdale Road, South of Shellard Road	14,083	15,039	15,119	6.52
L2	A664, Rochdale Road, South of Paget Street	14,083	15,039	15,079	6.52
L3	A644, Rochdale Road, North of Paget Street	14,083	15,039	15,098	6.52
L4	A664, Rochdale Road, Northbound (NB), South of A6010	6,697	7,152	7,181	6.76
L5	A664, Rochdale Road, NB, South of A6010, Slow Phase (SP)	6,697	7,152	7,181	6.76
L6	A6010, Topley Street	10,012	10,692	10,720	2.74
L7	A6010, Queens Road, West of Topley Street	19,256	20,563	20,617	2.80
L8	A664, Rochdale Road, NB, North of Topley Street	9,161	9,783	9,813	5.36
L9	A664, Rochdale Road, NB, North of A6010	9,161	9,783	9,798	5.36
L10	A664, Rochdale Road, Southbound (SB), North of A6010	8,999	9,610	9,625	4.54
L11	A664, Rochdale Road, SB, North of A6010, SP	8,999	9,610	9,625	4.54
L12	A664, Rochdale Road, SB, North of Topley Street	8,999	9,610	9,640	4.54
L13	A664, Rochdale Road, SB, South of A6010	7,387	7,889	7,918	6.28
L14	A6010, Queens Road, West of A664	9,243	9,871	9,897	2.86
L15	A6010, Queens Road, West of A664, SP	9,243	9,871	9,897	2.86
L16	A6010 intersection with A664	9,243	9,871	9,871	2.86
L17	A6010, Queens Road, East of A664	8,847	9,448	9,476	3.19
L18	A6010, Scropton Street	8,395	8,965	8,995	3.30
L19	A6010, Scropton Street, West of A664, SP	8,395	8,965	8,995	3.30
L20	Scropton Street intersection with A664	10,012	10,692	10,692	2.74
L21	A6010, Queens Road, South of Scropton Street	17,242	18,413	18,471	3.25
L22	Monsall Street	2,885	3,081	3,090	1.42

Link		24-hour AADT Flow			HDV Prop. of Fleet (%)
		Verif.	2023 DM	2023 DS	
L23	Monsall Street, East of A6010, SP	2,885	3,081	3,090	1.42
L24	A6010, Queens Road, North of Carslake Road	17,242	18,413	18,480	3.25
L25	A6010, Queens Road, South of Carslake Road	17,242	18,413	18,530	3.25
L26	Shellard Road, East of A664, SP	90	96	136	6.00
L27	Shellard Road/Thornton Street North, South of Paget Street	90	96	136	6.00
L28	Paget Street, East of A664, SP	220	235	333	6.00
L29	Paget Street, West of Thornton Street North	220	235	333	6.00
L30	Thornton Street North, North of Carslake Road	506	540	678	6.00
L31	Carslake Road	414	442	626	6.00
L32	Carslake Road, West of A6010, SP	414	442	626	6.00
L33	Thornton Street North, South of Carslake Road	93	99	141	6.00
L34	Collyhurst Street, East of A664, SP	3,786	4,043	4,043	0.66
L35	Collythurst Street, West of Thornton Street North	3,786	4,043	4,043	0.66
L36	Collythurst Street, East of Thornton Street North	3,786	4,043	4,085	0.66

1.4.6 Reference should be made to Figure 10.10 in Appendix 10.2 for a graphical representation of the road link locations.

1.4.7 Road widths were estimated from aerial photography and UK highway design standards. A summary of the link parameters is provided in Table A10.1.2.

Table A10.1.2 Road Parameters

Link		Road Width (m)	Average Vehicle Speed (km/h)
L1	A664, Rochdale Road, South of Shellard Road	11.1	35
L2	A664, Rochdale Road, South of Paget Street	10.9	35

Link		Road Width (m)	Average Vehicle Speed (km/h)
L3	A644, Rochdale Road, North of Paget Street	13.6	35
L4	A664, Rochdale Road, Northbound (NB), South of A6010	10.5	35
L5	A664, Rochdale Road, NB, South of A6010, Slow Phase (SP)	11.2	25
L6	A6010, Topley Street	7.9	30
L7	A6010, Queens Road, West of Topley Street	8.8	40
L8	A664, Rochdale Road, NB, North of Topley Street	11.6	30
L9	A664, Rochdale Road, NB, North of A6010	11.2	35
L10	A664, Rochdale Road, Southbound (SB), North of A6010	10.7	40
L11	A664, Rochdale Road, SB, North of A6010, SP	11.1	25
L12	A664, Rochdale Road, SB, North of Topley Street	11.0	30
L13	A664, Rochdale Road, SB, South of A6010	11.7	35
L14	A6010, Queens Road, West of A664	9.2	35
L15	A6010, Queens Road, West of A664, SP	11.3	25
L16	A6010 intersection with A664	12.5	25
L17	A6010, Queens Road, East of A664	8.9	35
L18	A6010, Scropton Street	7.5	30
L19	A6010, Scropton Street, West of A664, SP	12.9	25
L20	Scropton Street intersection with A664	14.2	25
L21	A6010, Queens Road, South of Scropton Street	9.9	35
L22	Monsall Street	7.1	35
L23	Monsall Street, East of A6010, SP	10.1	25
L24	A6010, Queens Road, North of Carslake Road	9.2	35
L25	A6010, Queens Road, South of Carslake Road	9.4	35
L26	Shellard Road, East of A664, SP	7.7	25
L27	Shellard Road/Thornton Street North, South of Paget Street	5.6	30
L28	Paget Street, East of A664, SP	9.6	25

Link		Road Width (m)	Average Vehicle Speed (km/h)
L29	Paget Street, West of Thornton Street North	7.3	30
L30	Thornton Street North, North of Carslake Road	5.7	30
L31	Carslake Road	8.7	30
L32	Carslake Road, West of A6010, SP	10.1	25
L33	Thornton Street North, South of Carslake Road	5.6	30
L34	Collyhurst Street, East of A664, SP	12.2	25
L35	Collythurst Street, West of Thornton Street North	7.3	35
L36	Collythurst Street, East of Thornton Street North	7.6	35

1.5 Emission Factors

1.5.1 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 10.1). This has been produced by DEFRA and incorporates COPERT 5.3 vehicle emission factors and fleet information.

1.5.2 There is current uncertainty over NO_2 concentrations within the UK, with the implementation of new vehicle emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2019 emission factors were utilised in preference to the development opening year in order to provide robust model outputs. As predictions for 2019 were verified, it is considered the results are a robust indication of worst case concentrations for the future year.

1.6 Meteorological Data

1.6.1 Meteorological data used in the assessment was taken from Manchester Airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). Manchester Airport is located at NGR: 381792, 384116, which is approximately 16.9km south-west of the development. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

1.6.2 All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 10.2 in for a wind rose of the utilised meteorological data.

1.7 Roughness Length

1.7.1 The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 0.5m was used to describe the modelling extents. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

1.7.2 A z_0 of 0.2m was used to describe the meteorological site. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'agricultural areas (min)'.

1.8 Monin-Obukhov Length

1.8.1 A minimum Monin-Obukhov length of 30m was used to describe the modelling extents and meteorological site. This value is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

1.9 Background Concentrations

1.9.1 Annual mean NO_2, PM_{10} and $PM_{2.5}$ background concentrations were taken from the DEFRA mapping study for the grid square containing the 39 - Rochdale Road monitoring position, NGR: 385500, 399500. These are shown in Table A10.1.3.

Table A10.1.3 Background Pollutant Concentration

Pollutant	Predicted 2019 Background Concentration (µg/m^3)
NO_2	20.83
PM_{10}	12.34
$PM_{2.5}$	8.19

1.9.2 The values shown in Table A10.1.3 were chosen to represent concentrations throughout the dispersion modelling extents without the contribution from road vehicles as they were

higher than the DEFRA background for the grid square containing the site, as shown in Table 10.16 Chapter 10 - Air Quality and Dust.

1.9.3 Similarly to emission factors, background concentrations from 2019 were utilised in preference to the opening year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposal.

1.10 NO_x to NO_2 Conversion

1.10.1 Predicted annual mean oxides of nitrogen (NO_x) concentrations were converted to NO_2 concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance[3].

1.11 Verification

1.11.1 The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

1.11.2 Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

1.11.3 For the purpose of the assessment model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year.

1.11.4 Manchester City Council undertook monitoring of NO_2 concentrations at one location within the vicinity of roads included within the model during 2019. The result was obtained and the road contribution to total NO_x concentration calculated following the

[3] Local Air Quality Management (TG16), DEFRA, 2018.

methodology contained within DEFRA guidance[4]. The monitored annual mean NO_2 concentration and calculated road NO_x concentration is summarised in Table A10.1.4.

Table A10.1.4 Verification - Monitoring Result

Monitoring Location		Monitored NO_2 Concentration (µg/m³)	Calculated Road NO_x Concentration (µg/m³)
36	Rochdale Road	31.7	21.49

1.11.5 The annual mean road NO_x concentration predicted from the dispersion model and the 2019 road NO_x concentration calculated from the monitoring result is summarised in Table A10.1.5.

Table A10.1.5 Verification - Modelling Result

Monitoring Location		Monitored NO_2 Concentration (µg/m³)	Modelled Road NO_x Concentration (µg/m³)
36	Rochdale Road	21.49	12.81

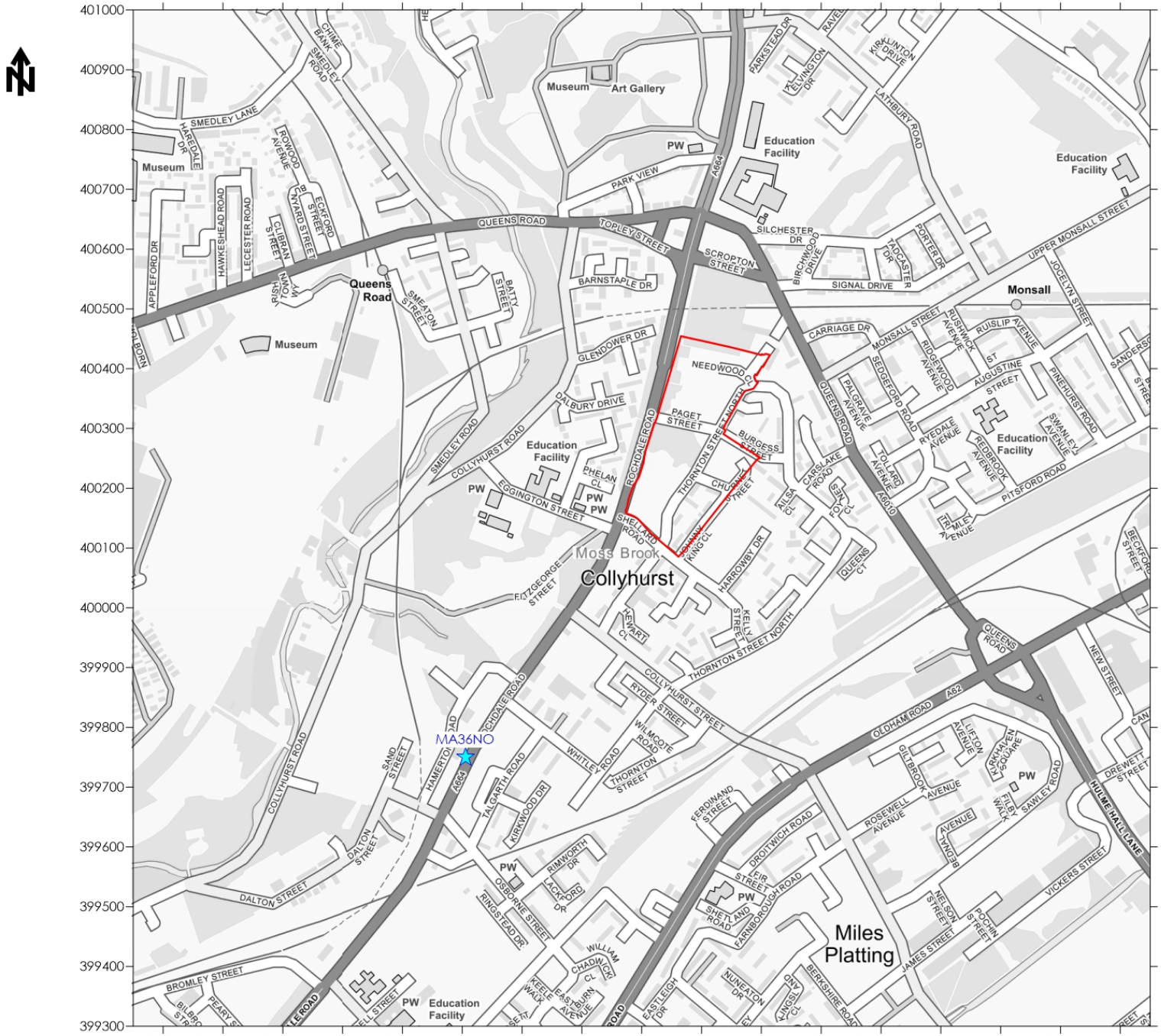
1.11.6 The monitored and modelled road NO_x concentrations were compared to calculate the associated ratio. This indicated a verification factor of 1.6783 was required to be applied to all modelling results.

1.11.7 Monitoring of PM_{10} and $PM_{2.5}$ concentrations is not undertaken within the assessment extents. The NO_x verification factor was therefore used to adjust PM_{10} and $PM_{2.5}$ model predictions in lieu of more accurate data in accordance with DEFRA guidance[5].

[4] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

[5] Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Appendix 10.2: Air Quality - Figures



Legend

Site Boundary

Monitor

Title
Figure 10.1 - Monitoring Locations

Project
Land at Collyhurst, Manchester

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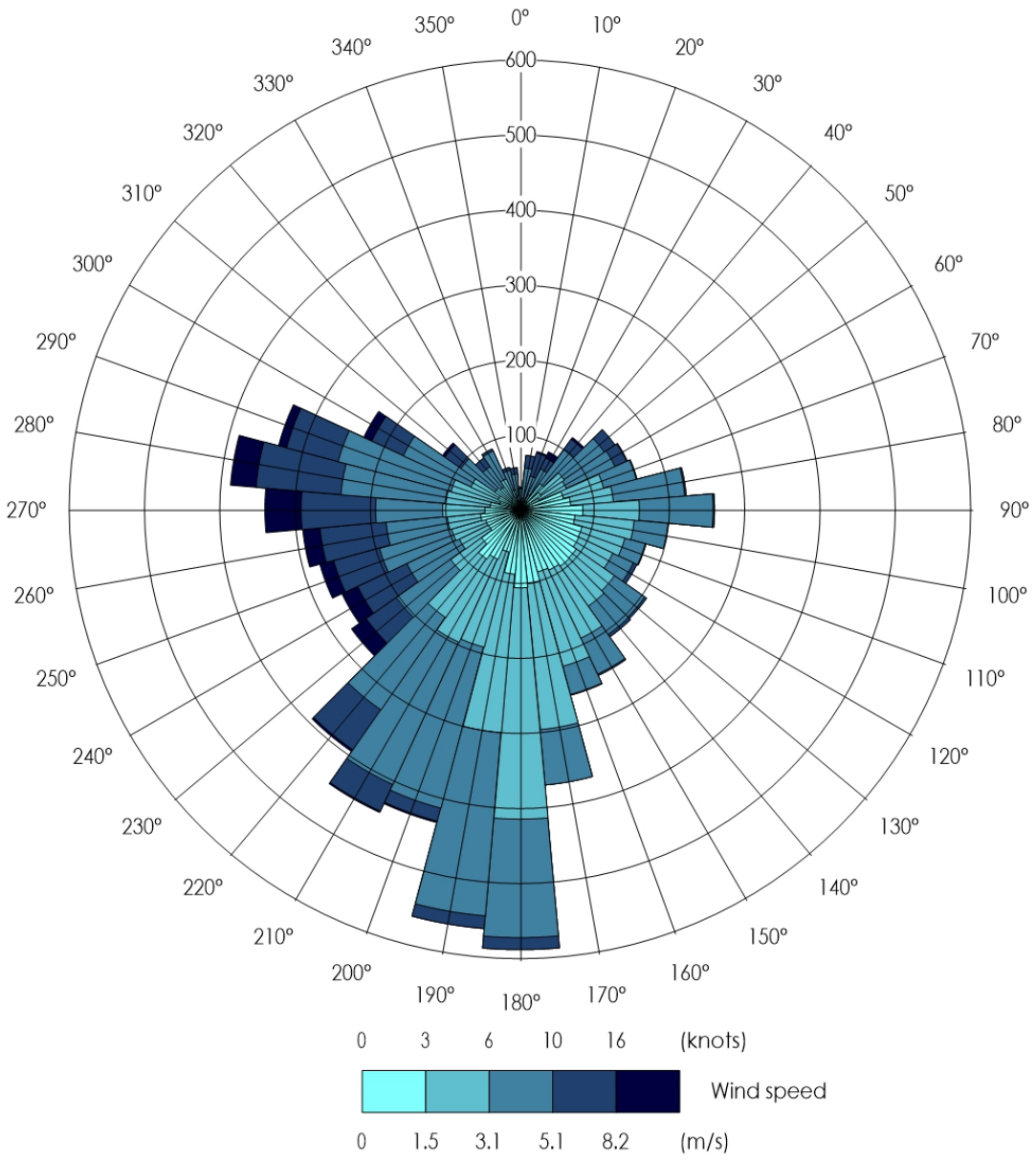

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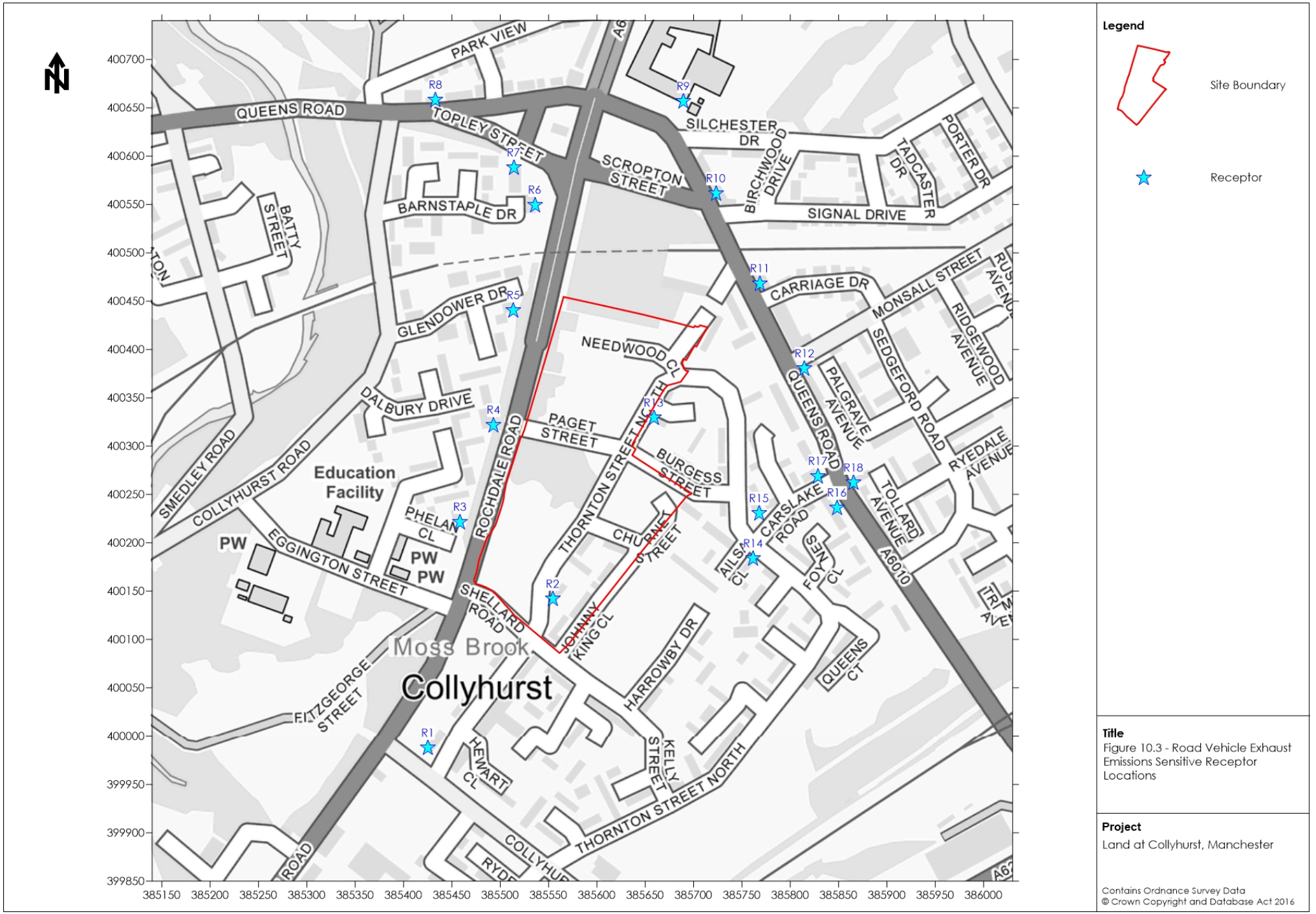
Title
Figure 10.2 - Wind Rose of 2019 Manchester Airport Meteorological Data

Project
Land at Collyhurst, Manchester


Legend
Site Boundary
Receptor
Title
Figure 10.3 - Road Vehicle Exhaust Emissions Sensitive Receptor Locations
Project
Land at Collyhurst, Manchester
Contains Ordnance Survey Data
© Crown Copyright and Database Act 2016
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
QUEENS ROAD
TOPLEY STREET
PARK VIEW
SCROPTON STREET
SILCHESTER DR
BIRCHWOOD DRIVE
TADCASTER DR
PORTER DR
SIGNAL DRIVE
BARNSTAPLE DR
BATTY STREET
GLENDOWER DR
CARRIAGE DR
MONSALL STREET
RIDGEWOOD AVENUE
SEDGEFORD ROAD
PALGRAVE AVENUE
QUEENS ROAD
RYEDALE AVENUE
TOLLARD AVENUE
NEEDWOOD CL
DALBURY DRIVE
PAGET STREET
ROCHDALE ROAD
THORNTON STREET NORTH
BURGESS STREET
CHURNET STREET
CARSLAKE ROAD
AILSA CL
FOYLE CL
A6010
SMEDLEY ROAD
COLLYHURST ROAD
Education Facility
PHELAN CL
EGGINGTON STREET
PW
SHELLARD ROAD
JOHNNY KING CL
HARROWBY DR
QUEENS CT
FITZGEORGE STREET
Moss Brook
Collyhurst
HEWART CL
KELLY STREET
THORNTON STREET NORTH
COLLYHURST ROAD
400700
400650
400600
400550
400500
400450
400400
400350
400300
400250
400200
400150
400100
400050
400000
399950
399900
399850
385150
385200
385250
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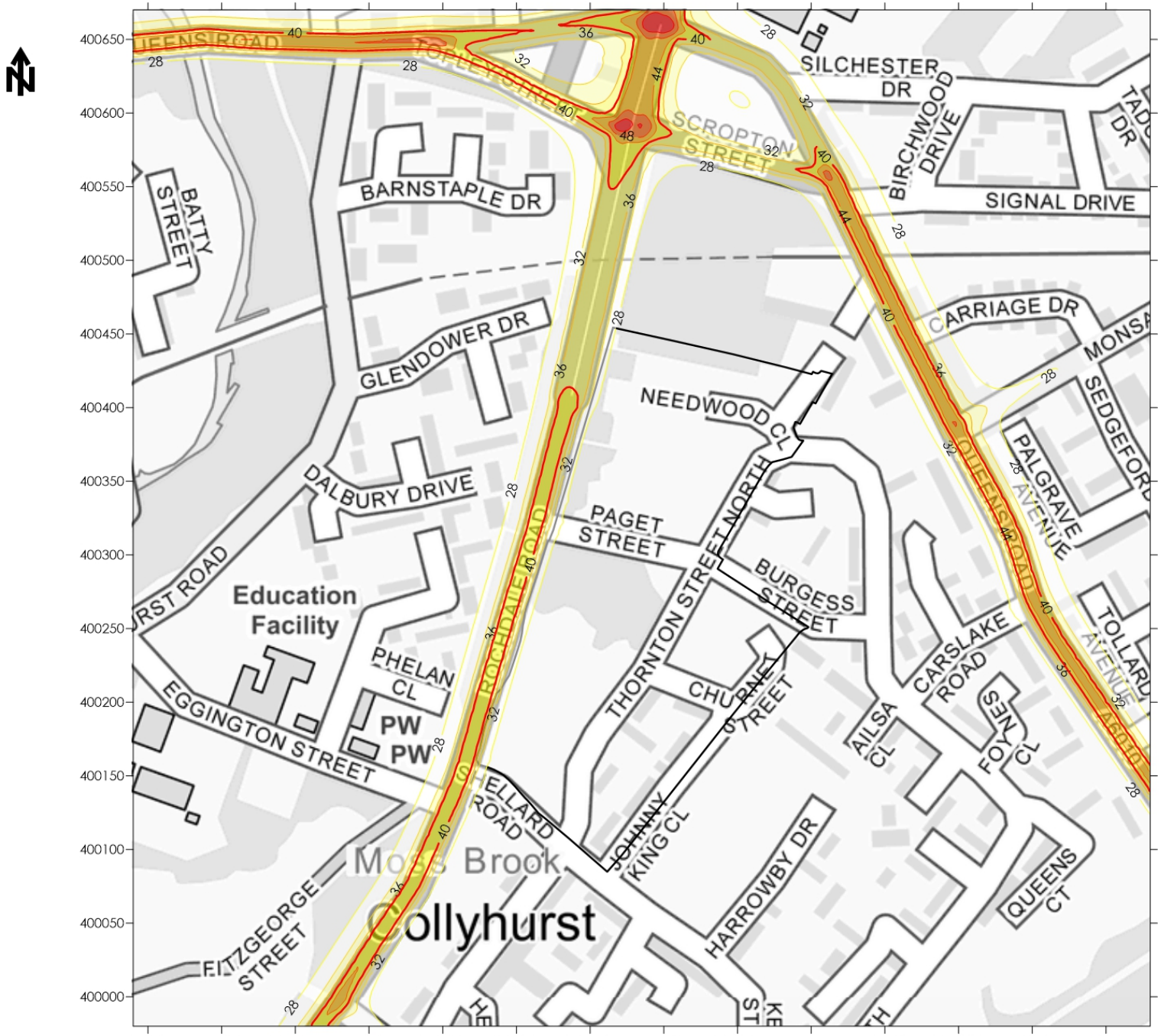
386000


Legend
Site Boundary
52
48
44
40
36
32
28
Annual Mean NO_2 Concentrations (µg/m³)
Title
Figure 10.4 - Predicted Annual Mean NO_2 Concentrations (µg/m³) Do-Minimum
Project
Land at Collyhurst, Manchester
Contains Ordnance Survey Data
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QUEENS ROAD
TOFTLEE STREET
SILCHESTER DR
SCROPTON STREET
BIRCHWOOD DRIVE
SIGNAL DRIVE
BARNSTAPLE DR
BATTY STREET
GLENDOWER DR
CARRIAGE DR
NEEDWOOD CL
DALBURY DRIVE
PAGET STREET
THORNTON STREET NORTH
BURGESS STREET
PALGRAVE AVENUE
SEDGEFORD
TOLLARD AVENUE
Education Facility
PHELAN CL
PW
PW
EGGINGTON STREET
ROCHDALE ROAD
CHURNET STREET
CARSLAKE ROAD
AILSA CL
FOYES CL
SHELLARD ROAD
JOHNNY KING CL
HARROWBY DR
QUEENS CT
FITZGEORGE STREET
Moss Brook
Collyhurst
400650
400600
400550
400500
400450
400400
400350
400300
400250
400200
400150
400100
400050
400000
385250
385300
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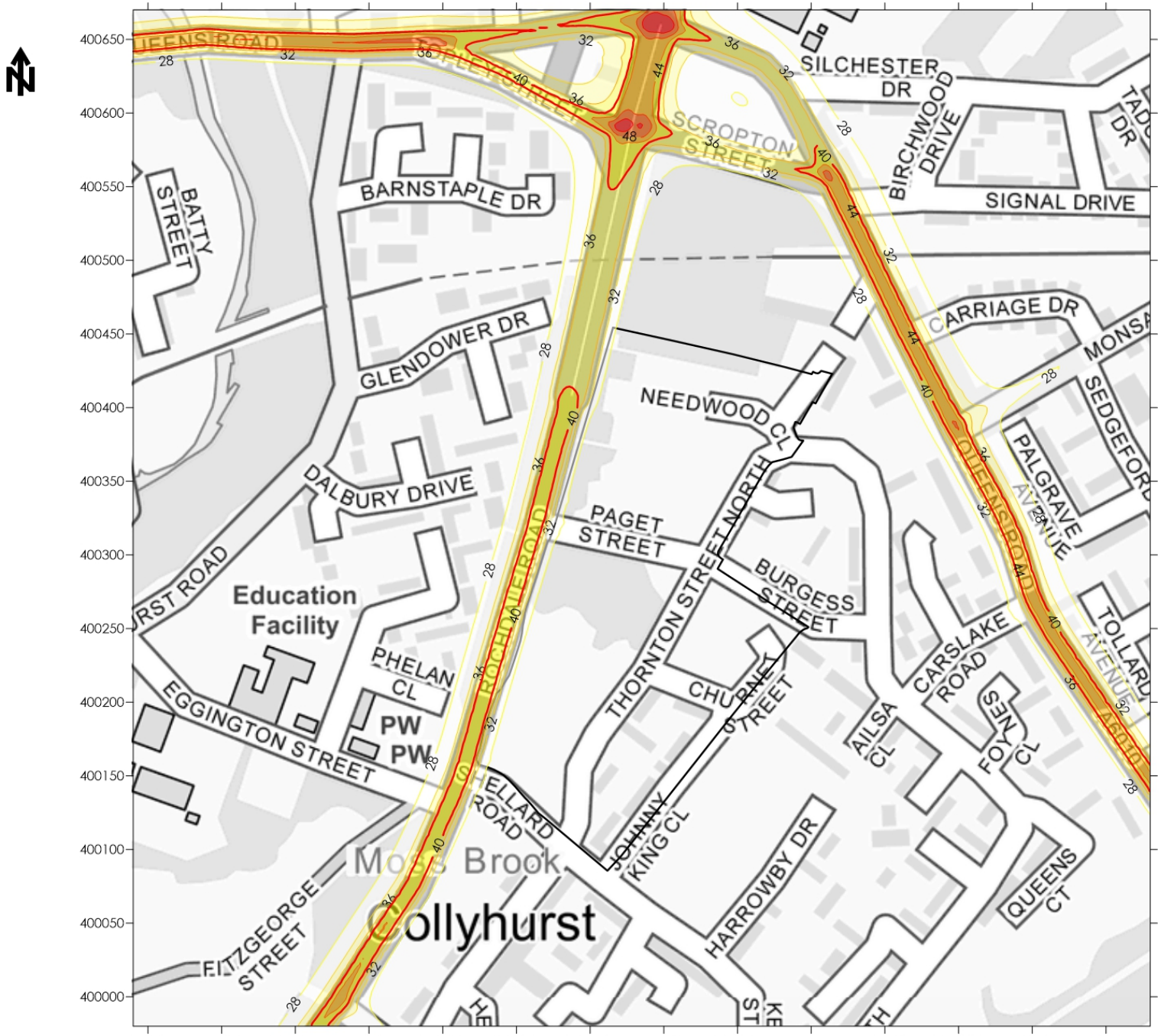

Legend

Site Boundary

Annual Mean NO_2 Concentrations (µg/m³)

52
48
44
40
36
32
28

Title

Figure 10.5 - Predicted Annual Mean NO_2 Concentrations (µg/m³) Do-Something

Project

Land at Collyhurst, Manchester

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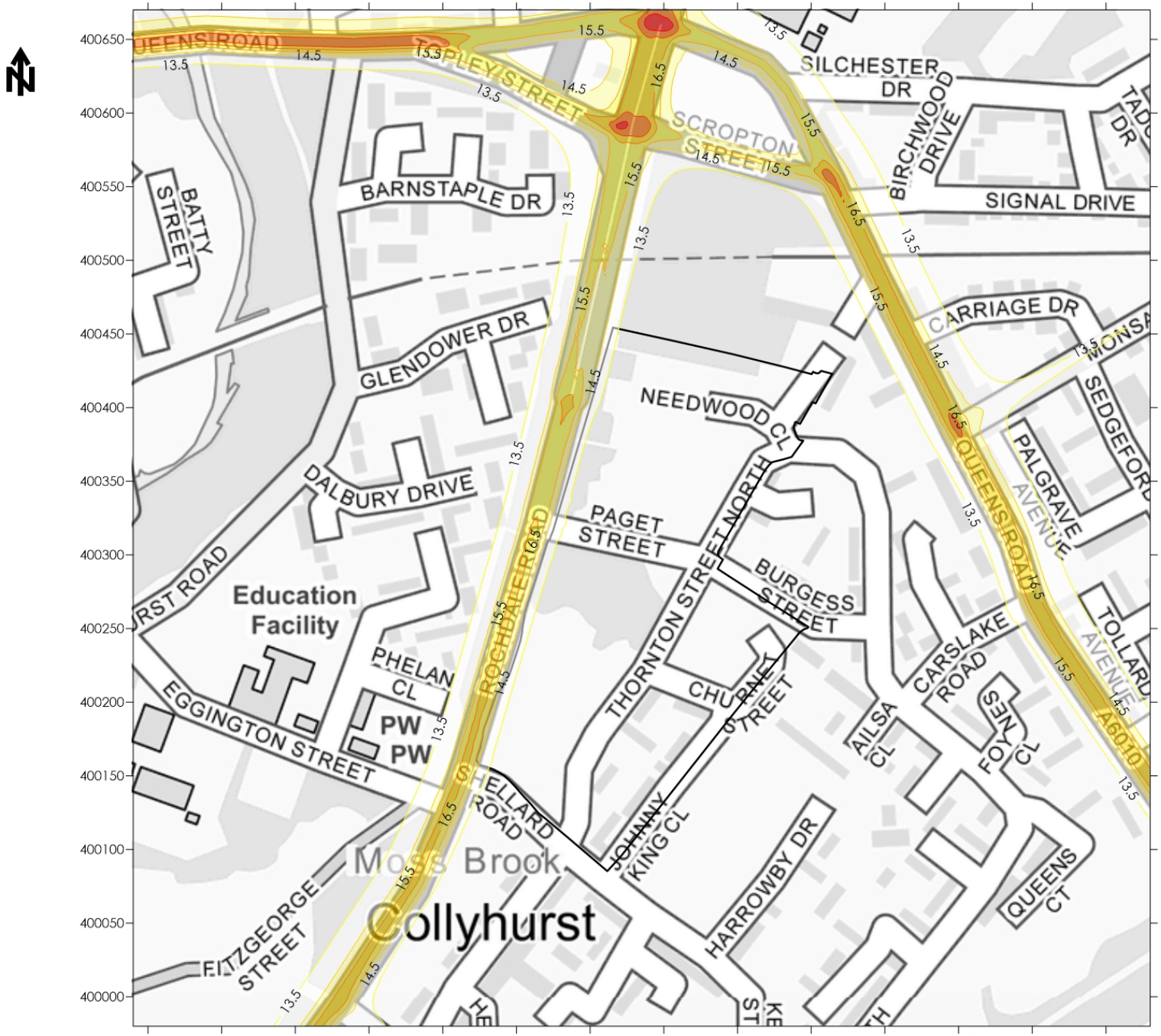

Legend

Site Boundary

Annual Mean PM_{10} Concentrations (µg/m³)

18.5
17.5
16.5
15.5
14.5
13.5

Title

Figure 10.6 - Predicted Annual Mean PM_{10} Concentrations (µg/m³) Do-Minimum

Project

Land at Collyhurst, Manchester

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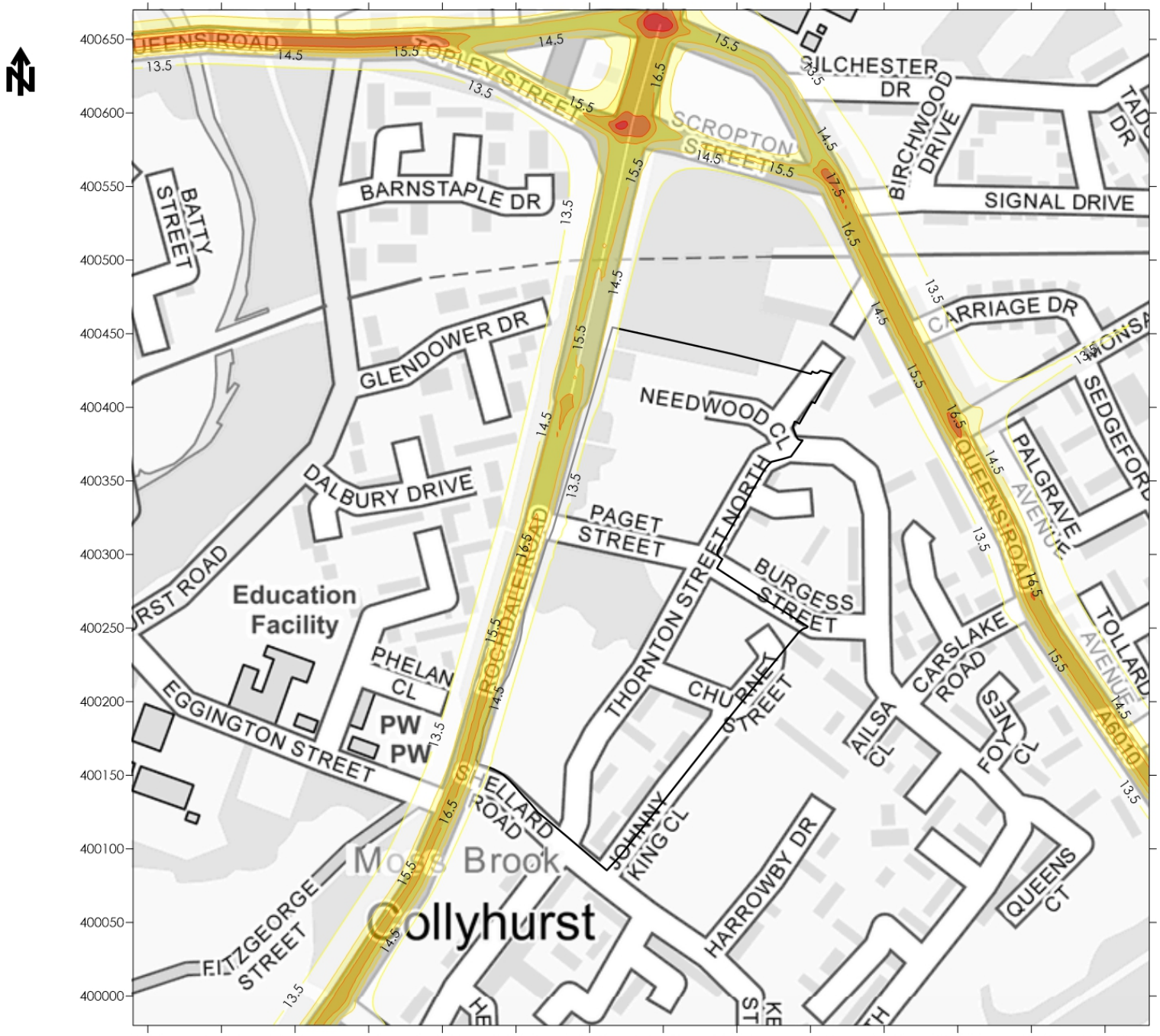

Legend

Site Boundary

Annual Mean PM_{10} Concentrations (µg/m³)

- 18.5
- 17.5
- 16.5
- 15.5
- 14.5
- 13.5

Title

Figure 10.7 - Predicted Annual Mean PM_{10} Concentrations (µg/m³) Do-Something

Project

Land at Collyhurst, Manchester

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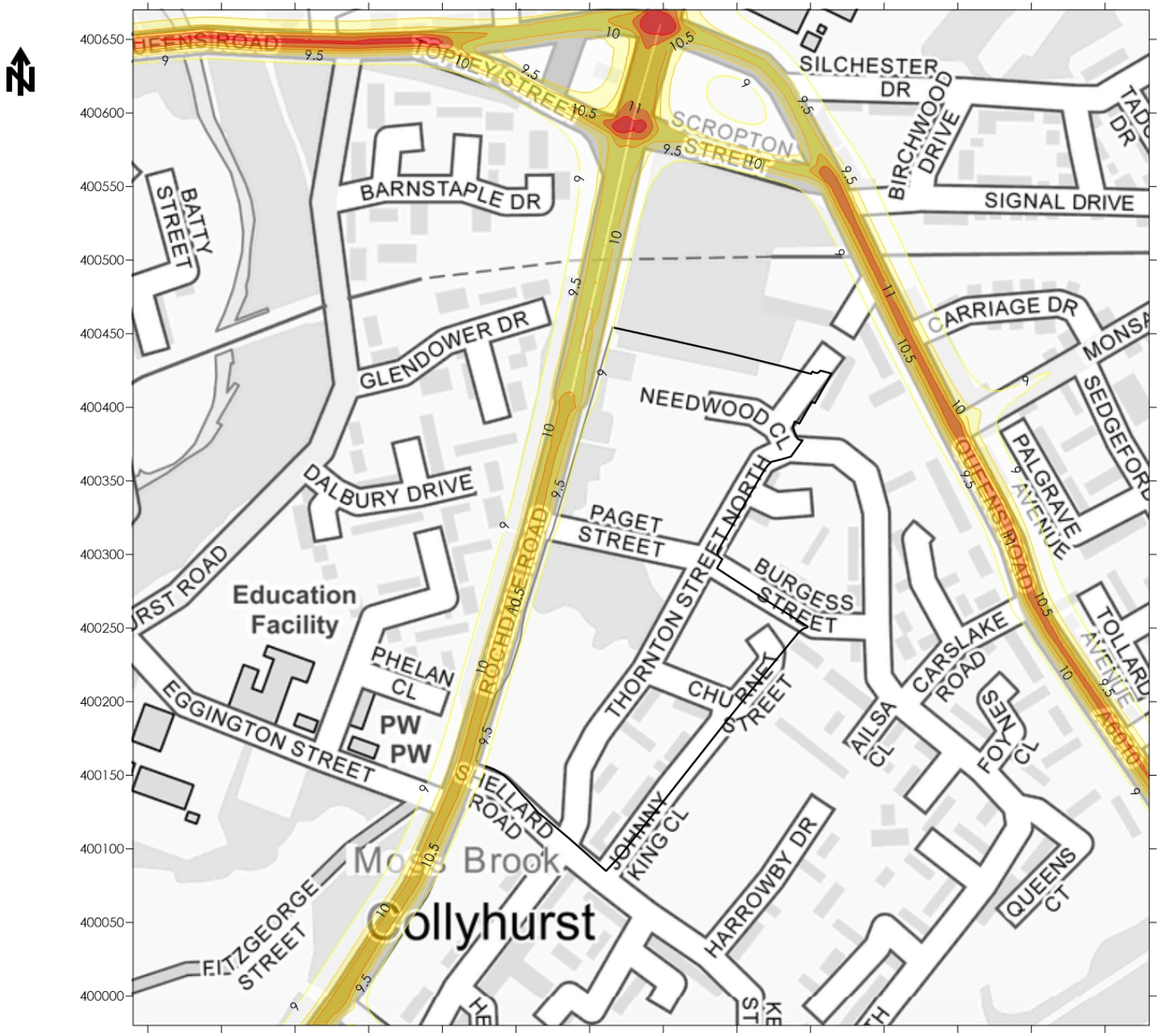

Legend

Site Boundary

Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

11.5
11
10.5
10
9.5
9

Title

Figure 10.8 - Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m³) Do-Minimum

Project

Land at Collyhurst, Manchester

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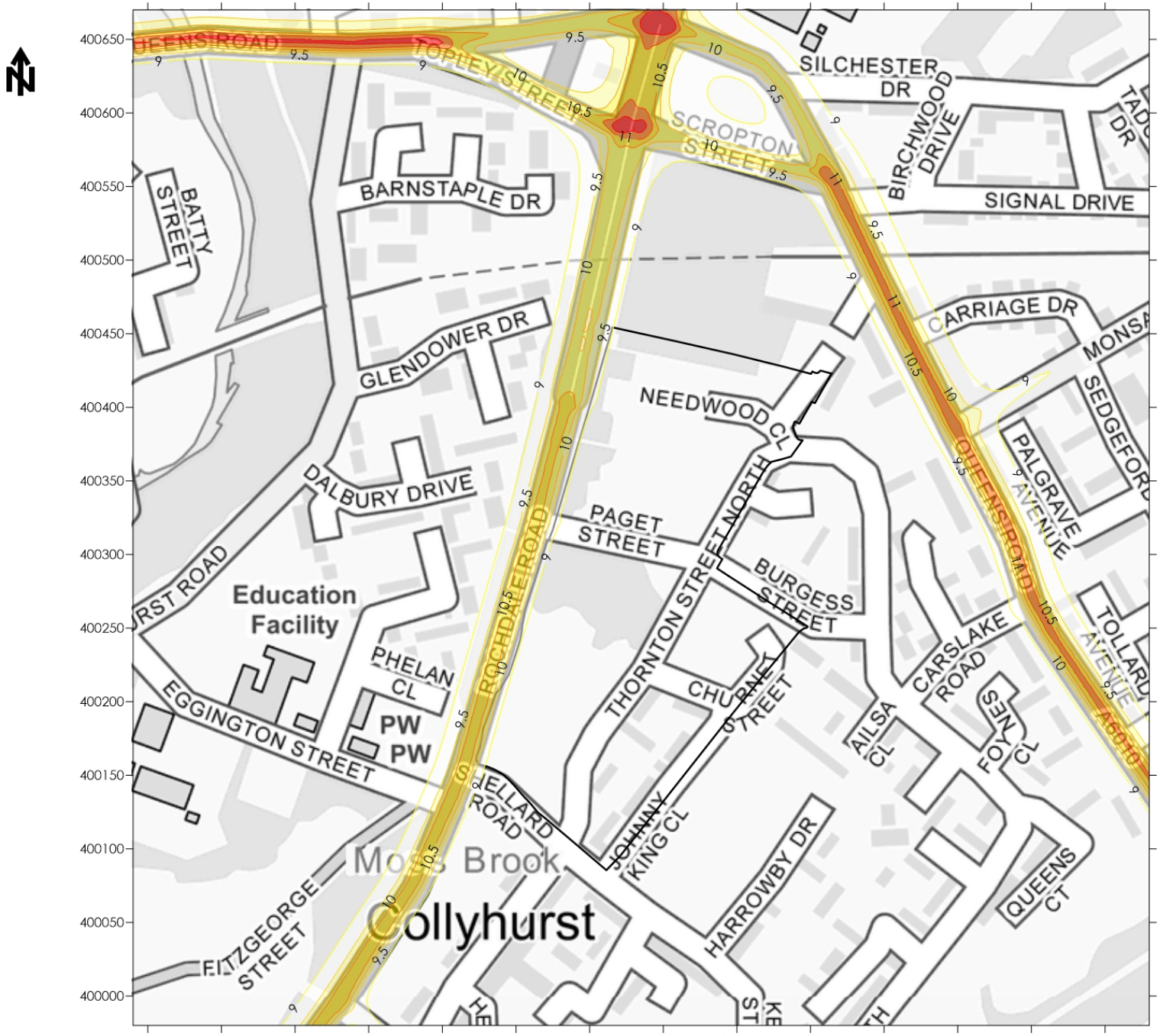

Legend

Site Boundary

Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

11.5
11
10.5
10
9.5
9

Title

Figure 10.9 - Predicted Annual Mean $PM_{2.5}$ Concentrations (µg/m³) Do-Something

Project

Land at Collyhurst, Manchester

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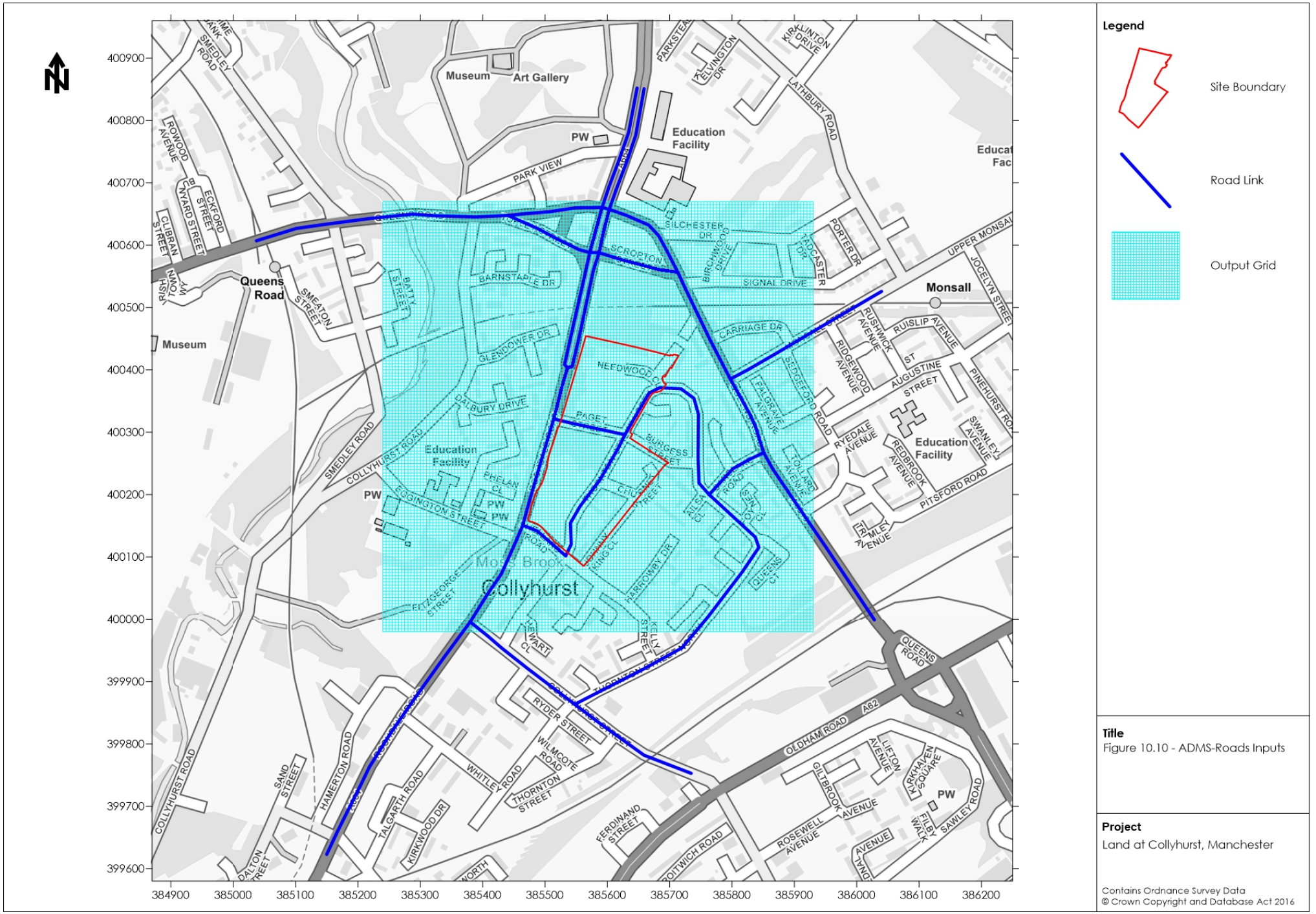
Legend
Site Boundary
Road Link
Output Grid
Title
Figure 10.10 - ADMS-Roads Inputs
Project
Land at Collyhurst, Manchester
Contains Ordnance Survey Data
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Museum
Art Gallery
Education Facility
PW
Queens Road
Monsall
Collyhurst
Moss Brook
400900
400800
400700
400600
400500
400400
400300
400200
400100
400000
399900
399800
399700
399600
384900
385000
385100
385200
385300
385400
385500
385600
385700
385800
385900
386000
386100
386200

Appendix 10.3: Air Quality - Abbreviations and Glossary

Abbreviations

AADT - Annual Average Daily Traffic

ADM - Atmospheric Dispersion Modelling

AQAP - Air Quality Action Plan

AQLV - Air Quality Limit Value

AQMA - Air Quality Management Area

AQO - Air Quality Objective

AQS - Air Quality Strategy

AQTV - Air Quality Target Value

CERC - Cambridge Environmental Research Consultants

CEMP - Construction Environmental Management Plan

DEFRA - Department for Environment, Food and Rural Affairs

DfT - Department for Transport

DM - Do-Minimum

DMP - Dust Management Plan

DMRB - Design Manual for Roads and Bridges

DS - Do-Something

ES - Environmental Statement

EV - Electric Vehicle

GMCA - Greater Manchester Combined Authority

HDV - Heavy Duty Vehicle

IAQM - Institute of Air Quality Management

LA - Local Authority

LAQM - Local Air Quality Management

MCC - Manchester City Council

NB - Northbound

NGR - National Grid Reference

NPPF - National Planning Policy Framework

NPPG - National Planning Practice Guidance

NO_2 - Nitrogen Dioxide

NO_x - Oxides of Nitrogen

PM_{10} - Particulate Matter with an aerodynamic diameter of less than 10µm

$PM_{2.5}$ - Particulate Matter with an aerodynamic diameter of less than 2.5µm

SB - Southbound

SP - Slow Phase

z_0 - Roughness Length

Glossary

Air Quality Limit Value - Legally binding parameters defined in European Union air quality legislation that must not be exceeded. Limit values are set for individual pollutants and are a combination of a concentration value, an averaging time over which it is measured, the number of exceedences allowed per year, and a date by which it must be achieved.

Air Quality Management Area - An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.

Air Quality Objective - The name given to the maximum ambient pollutant concentration that is not to be exceeded either without exception or within a permitted number of exceedences over a specified timescale for a pollutant outlined in the nation Air Quality Strategy.

Air Quality Strategy - A national government document which contains standards, objectives and measures for improving ambient air quality.

Annual Average Daily Traffic - The number of traffic movements on a given road in a 24-hour period as an average across one year.

Background Concentration - The pollutant concentration assumed to represent baseline concentrations in the atmosphere across the modelled area.

Diffusion Tube Monitoring - A passive, periodic monitoring method. The tubes contain a substance which absorb the pollutant of interest at a known rate and from the period exposed and subsequent analysis an ambient pollutant concentration can be calculated.

Do-Minimum - The scenario representing predicted traffic flows in the future year inclusive of committed developments should the proposals not be completed.

Do-Something - The scenario representing predicted traffic flows in the future year inclusive of committed developments should the proposals be completed.

Dust - Dust is a generic term covering particles of different compositions, shapes and sizes. These can have different impacts and effects:

- Those particles up to 10μm (micrometres) in diameter (known as PM_{10}) remain suspended in air for long periods and because they are fine enough to be breathed in and can, potentially, cause health effects.
- The particles that are larger (and maybe visible to the naked eye) are not thought to cause health effects to the same extent, but can cause disamenity through soiling and staining when they deposit onto window ledges, cars, laundry and plants etc.

Dust Management Plan - A document that describes the site specific methods to be used to control dust emissions.

Heavy Duty Vehicle: Vehicles with a gross weight of greater than 3.5 tonnes.

Roughness Length: A measure of the surface roughness of the area.

Trackout: The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when HDVs leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

Memo:	M008-B	**Date:**	30 September 2020
Project:	19514	**Pages:**	3
From:	Kane Mitchell	**Reviewer:**	Matthew Robinson

Collyhurst Redevelopment, Manchester Northern Gateway

ES chapter – Construction noise assessment plant assumptions

This memo presents our construction plant assumptions. These have been updated following initial comments from FEC.

Construction phases

The following construction phases are expected to encompass most of the works associated with the development:

- Demolition
- Enabling works
- Structural construction
- Internal fit-out and finishing works

The demolition, enabling works and structural construction works are expected to include the potentially noisiest works associated with the development. The internal fit-out and finishing works are not expected to result in high external noise levels, and therefore are not proposed to be assessed.

For each construction phase, details of the different construction plant, number, the percentage of time they will be operational and their associated sound pressure level, as set in BS 5228:2009, are provided in the following section.

Enabling works phase

Table 1 Enabling works phase plant assumptions

Construction plant	Number	% activity	BS5228-1 reference	L_{Aeq} at 10 m (dB)
Excavators 16T	1	60	C.2-5	76
Lorries and vans	2	30	C.6-21	80[1]
Tipper lorries	15	25	C.8-20	79[1]

[1] Drive by maximum sound pressure level in L_{Amax}

Demolition works phase

Table 2 Demolition works phase plant assumptions

Construction plant	Number	% activity	BS5228-1 reference	L_{Aeq} at 10 m (dB)
Excavators 16T	1	60	C.2-5	76
Excavators with breakers	1	60	C.1-9	90
Lorries and vans	2	30	C.6-21	80[1]
Tipper lorries	5	25	C.8-20	79[1]
Water pumps	1	15	C.8-22	71

[1] Drive by maximum sound pressure level in L_{Amax}

Structural construction phase

Table 3 Structural construction phase plant assumptions

Construction plant	Number	% activity	BS5228-1 reference	L_{Aeq} at 10 m (dB)
Forklift truck	2	50	D.7-94	88[1]
Lorries and vans	4	30	C.6-21	80[1]
Ready mixed concrete lorry	1	60	C.4-21	77
Scaffolding and hydraulic access platforms	4	75	C.4-57	67
Tipper lorries	4	15	C.8-20	79[1]

Construction plant	Number	% activity	BS5228-1 reference	L_{Aeq} at 10 m (dB)
Flatbed articulated vehicle	4	15	C.11-11	86[1]
Large rigid lorries	4	15	C.6-23	82[1]

[1] Drive by maximum sound pressure level in L_{Amax}

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

19514-R05-B

4 December 2020

Collyhurst Village

Nosie and vibration planning report

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Version	Date	Comments	Author	Reviewer
A	29 Oct 20		Kane Mitchell	Matthew Robinson
B	4 Dec 20	Updated following revised site plans	Kane Mitchell	Matthew Robinson

Summary

Sandy Brown has been commissioned by Far East Consortium to provide an assessment of noise and vibration in relation to the proposed development at Collyhurst Village.

The daytime noise and ground-borne vibration survey was carried out on 18 December 2019 and the night-time noise survey was carried out on 9 January 2020.

The lowest measured background sound levels measured during the survey were:

- NSP1 Residential dwellings along Thornton Street North – $L_{A90,5min}$ 51 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 41 dB during the night-time (23:00-07:00)
- NSP2 Residential dwellings along Stretton Close – $L_{A90,5min}$ 53 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 40 dB during the night-time (23:00-07:00)
- NSP3 Residential dwellings along Rochdale Road – $L_{A90,5min}$ 58 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 47 dB during the night-time (23:00-07:00)
- NSP4 Church of the Saviour church and school – $L_{A90,5min}$ 57 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 45 dB during the night-time (23:00-07:00).

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed:

- NSP1 Residential dwellings along Thornton Street North - $L_{Aeq,15min}$ 49 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 39 dB during the night-time (23:00-07:00)
- NSP2 Residential dwellings along Stretton Close - $L_{Aeq,15min}$ 51 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 38 dB during the night-time (23:00-07:00)
- NSP3 Residential dwellings along Rochdale Road - $L_{Aeq,15min}$ 56 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 45 dB during the night-time (23:00-07:00)
- NSP4 Church of the Saviour church and school - $L_{Aeq,15min}$ 55 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 43 dB during the night-time (23:00-07:00).

The average ambient noise levels measured during the survey were between $L_{Aeq,5min}$ 53-78 dB during the daytime and $L_{Aeq,5min}$ 46-69 dB at night.

The overall sound insulation requirements range between R'_w+C_{tr} 25 dB and R'_w+C_{tr} 45 dB depending on the location of the facade. Ventilation may be provided in the form of either acoustically attenuated passive ventilation or mechanical ventilation, depending on the facade location.

A level 1 acoustics, ventilation and overheating assessment has been undertaken, the results of which indicate a level 2 assessment is required. This will be carried out once a TM59 assessment is available for review.

An assessment of noise levels in external amenity spaces has been undertaken, the results of which indicate that the upper guideline value is predicted to be exceeded in most locations, though this is not expected to have a significant negative impact on the uses of the spaces.

Internal noise limits have been set for the proposed commercial unit in order to ensure entertainment noise egress and transfer are adequately controlled.

The vibration assessment indicates that re-radiated noise and tactile vibration are expected to be below their respective criteria.

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1 Introduction 6
2 Site description 6
3 Development proposals 8
4 Assessment criteria 9
5 Survey method 18
6 Measurement results 19
7 Control of plant noise egress 25
8 Facade sound insulation – noise ingress 26
9 External amenity areas 30
10 Entertainment noise egress 31
11 Ground-borne vibration ingress assessment 32
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Facade zone mark-ups 40

1 Introduction

Sandy Brown has been commissioned by Far East Consortium to provide an assessment of noise in relation to the proposed development at Collyhurst Village.

An environmental noise survey has been carried out to establish:

- Background sound levels around the site and by nearby noise sensitive premises
- Ambient and maximum noise levels at the site
- Vibration levels affecting the site.

The background sound levels measured during the survey are used as the basis for setting limits for noise emission from proposed building services plant. These limits are set in accordance with the requirements of the Manchester City Council.

Ambient and maximum noise levels are used to assess building envelope sound insulation requirements to achieve appropriate internal noise levels for residences. These follow standards set in accordance with Manchester City Council guidelines.

Vibration levels are used to assess the degree to which the proposed development will be affected by tactile vibration and re-radiated noise from the tramline to the north of the site.

This report provides details of the noise and vibration surveys, including measurement results, and provides recommendations.

2 Site description

2.1 The site and its surroundings

The site location in relation to its surroundings is shown in Figure 1 with the site boundary highlighted in red.

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

The noise and vibration measurement locations are provided in Figure 2.

Figure 2 Noise and vibration measurement locations (courtesy of Google Earth Pro)

2.2 Adjacent premises

The adjacent noise sensitive premises are:

- NSP 1 - Residential properties along Thornton Street North, highlighted in pink in Figure 1 located approximately 10m from the site boundary to the north and within the site boundary to the south
- NSP 2 - Residential properties along Stretton Close, highlighted in yellow in Figure 1, located approximately 30m from the site boundary
- NSP 3 - Residential properties along Rochdale Road, highlighted in blue in Figure 1 located approximately 70m from the site boundary
- NSP4 - The Church of the Saviour church and school (NSP 4), highlighted in green in Figure 1 approximately 150m from the site boundary
- NSP5 - Existing residential properties along Thornton Street North. It is understood that once the development is completed, the NSP5 dwellings to the south of the site are to be demolished and will be redeveloped as the new Collyhurst Park.

3 Development proposals

The development is to comprise of predominantly residential dwellings with two apartment blocks and the potential for a commercial unit within Apartment Block A.

The site plan is shown in Figure 3.

The area to the east of the site is to be developed into Collyhurst Park.

Figure 3 Massing plan (Buttress drawing *8871-BA-MP-00-DR-A-(04)706-P5*)

3.1 Hours of operation

The exact use for the commercial unit proposed as part of the development is yet to be confirmed, however for the purpose of this assessment it is assumed it will be capable of operate during both the daytime (07:00-23:00) and night-time (23:00-07:00).

3.2 Potential noise sources

The potential noise sources associated with the scheme can be broadly divided into two categories:

- Building services plant
- Internal activities in commercial unit.

The potential impact of these sources has been assessed and mitigation measures have been proposed to minimise impact on existing noise sensitive premises around the development.

4 Assessment criteria

4.1 NPPF and NPSE

The National Planning Policy Framework, February 2019 (NPPF) sets out the UK government's planning policies for England. It supersedes previous guidance notes such as PPG24. No specific noise criteria are set out in the NPPF, or in the Noise Policy Statement for England (NPSE) to which it refers.

The NPPF states:

> *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> - *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.*
> - *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'*

and

> *'Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community*

> *facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'*

The NPSE states that its aims are as follows:

> *'Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*
>
> - *Avoid significant adverse impacts on health and quality of life*
> - *Mitigate and minimise adverse impacts on health and quality of life and*
> - *Where possible, contribute to the improvement of health and quality of life.'*

As such, neither document sets out specific acoustic criteria for new residential developments, but they require consideration of the effect of existing noise on the new development and the effect of noise from the development on the surroundings.

4.2 ProPG

ProPG *Planning & Noise (Professional Practice Guidance on Planning & Noise), New Residential Development, 2017* provides guidance to the management of noise within the planning system in England. It is restricted to consideration of new residential developments that will be exposed predominantly to airborne noise from transport sources.

The two stages of the approach are given below

- Stage 1 – Initial noise risk assessment of the proposed development site
- Stage 2 – Systematic consideration of four key elements
    - Element 1 – Demonstrating a "Good Acoustic Design Process"
    - Element 2 – Observing internal "Noise Level Guidelines"
    - Element 3 – Undertaking an "External Amenity Area Noise Assessment"
    - Element 4 – Consideration of "Other Relevant Issues".

Following this approach, there are four possible recommendations, the choice of recommendation is as follows:

- Grant without conditions
- Grant with conditions
- Avoid
- Prevent.

Guidance provided in ProPG has been used to assess the proposed development site and recommend mitigation measures to reduce noise levels.

4.3 Noise egress

4.3.1 Standard guidance

BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at the nearest noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

4.3.2 Local Authority criteria – Building services noise egress

Manchester City Council, GD03 Public protection information for developers, Section 3, sets out planning conditions in relation to noise egress from plant associated with developments:

> *'Before the development hereby approved is occupied, the building, together with any externally mounted ancillary equipment, shall be acoustically insulated in accordance with the scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site/property. Externally mounted ancillary plant, equipment and servicing shall be acoustically treated in accordance with a scheme designed so as to achieve a noise level of 5dB below the existing background (LA90) in each octave band at the nearest noise sensitive location.'*

4.3.3 Local Authority criteria – Entertainment noise egress

Manchester City Council planning and noise technical guidance December 2015 also provides guidance on entertainment noise, which could result from the commercial units proposed as part of the development. This guidance states:

> *'Music noise levels in the 63 Hz and 125 Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB (L_{eq}), respectively'.*

In addition to the above, for units which are structurally detached from other building uses should demonstrate that music noise from the proposal will not be 'audible; in nearby residential properties, assuming that the residential properties in question have their windows open. The criterion is noted as:

'Entertainment noise (L_{Aeq}) should be controlled to 10 dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location'

4.4 Noise ingress

4.4.1 Local Authority requirements

Manchester City Council stipulates the criteria provided in Table 1 with regards to internal noise in residential developments due to background ventilation.

Table 1 Manchester City Council internal noise criteria for residential developments

Internal space	Internal noise limit, L_{Aeq} (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Living rooms	35	35
Bedrooms	35	30

It is also stipulates that individual noise events in bedrooms should not exceed L_{AFmax} 45 dB by more than 15 times.

It is understood from discussion with Manchester City Council that the above noise criteria do not apply during purge ventilation (ie, when windows are open to get rid of cooking /paint smells, etc) and that during rapid ventilation for summertime cooling, MCC permit a 5 dB relaxation on the criteria.

4.4.2 British Standard guidance

Guidance on acceptable internal noise levels in residential dwellings is given in BS 8233:2014 *Sound insulation and noise reduction for buildings*. The guidance limits are shown in Table 2.

These internal levels are based on annual average data and do not have to be achieved in all circumstances. It is normal to exclude occasional events, such as fireworks night or New Year's Eve.

Table 2 Internal noise criteria for sleeping/resting

Internal space	Indoor ambient noise level, L_{Aeq} (dB)	
	Daytime (07:00-23:00)	Night (23:00-07:00)
Living rooms	35	-
Dining room	40	-
Bedrooms	35	30[1]

[1] BS 8233 notes that individual noise events can cause sleep disturbance, and that a guideline value may be set depending on the character and number of events per night, although no specific limit is provided. For regular events, such as scheduled aircraft or passing trains, a guideline value may be set in terms of SEL or $L_{Amax,F}$. Sporadic noise events could require separate values.

The standard states that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

For external amenity areas, such as gardens and patios, the standard states:

> *'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'*

4.4.3 ProPG

Internal noise ingress criteria in ProPG are the same as in BS 8233:2014 but additional guidance is provided. In relation to regular individual noise events the following additional guidance is provided:

> *'In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events*.'

4.4.4 Acoustics, ventilation and overheating

Guidance on external noise levels from transport noise sources and the assessment of risk in an overheating condition is given in the Association of Noise Consultants *Acoustics Ventilation and Overheating, Residential Design Guide* (AVOG). External noise levels and the associated risk categories for a Level 1 assessment are adapted and summarised in Table 3, though consideration also has to be given the duration and frequency of any overheating periods.

Table 3 Guidance for Level 1 assessment of noise from transport sources relating to overheating condition

Risk category for Level 1 assessment	External free-field noise level	
	Daytime (07:00-23:00)	Night (23:00-07:00)
Low	$L_{Aeq} \leq 52$ dB	$L_{Aeq} \leq 47$ dB
Medium	$L_{Aeq} > 52$ dB and $L_{Aeq} \leq 62$ dB	$L_{Aeq} > 47$ dB and $L_{Aeq} \leq 55$ dB
High	$L_{Aeq} > 62$ dB	$L_{Aeq} > 55$ dB

If a Level 1 assessment finds that the development falls into a 'Medium' or 'High' risk category a Level 2 assessment should be carried out, assessing the expected internal noise levels for an overheating condition and the associated risk of adverse effect.

The guidance for suitable internal noise levels in order that noise ingress can be suitably controlled for an overheating condition are provided in AVOG. These are adapted and summarised in Table 4, though are not supposed to be taken as limits, rather guidelines to be assessed while also considering the adverse effect of any overheating (duration and severity).

The lowest observed affect level (LOAEL) and the significant observed affect level (SOAEL) for increased noise levels associated with controlling overheating are specific to each project as these depend on the magnitude of the increased internal noise levels and the duration for which they occur.

Table 4 Guidance for Level 2 assessment of noise from transport sources relating to overheating condition

Risk category	Internal noise level		
	Daytime (07:00-23:00)	Night (23:00-07:00)	
Negligible (noise can be heard, but does not cause any change in behaviour)	L_{Aeq} ≤ 35 dB	L_{Aeq} ≤ 30 dB	L_{AFmax} 45 dB not normally exceeded
↓	L_{Aeq} > 35 dB and L_{Aeq} ≤ 40 dB	L_{Aeq} > 30 dB and L_{Aeq} ≤ 35 dB	-
	L_{Aeq} > 40 dB and L_{Aeq} ≤ 50 dB	L_{Aeq} > 35 dB and L_{Aeq} ≤ 42 dB	-
High (noise causes a material change in behaviour)	L_{Aeq} > 50 dB	L_{Aeq} > 42 dB	L_{AFmax} 65 dB not exceeded

The AVOG illustrates that there is a link between adverse effects, increasing internal ambient noise levels and the duration of exposure to noise for an overheating condition. These are indicated in Figure 4.

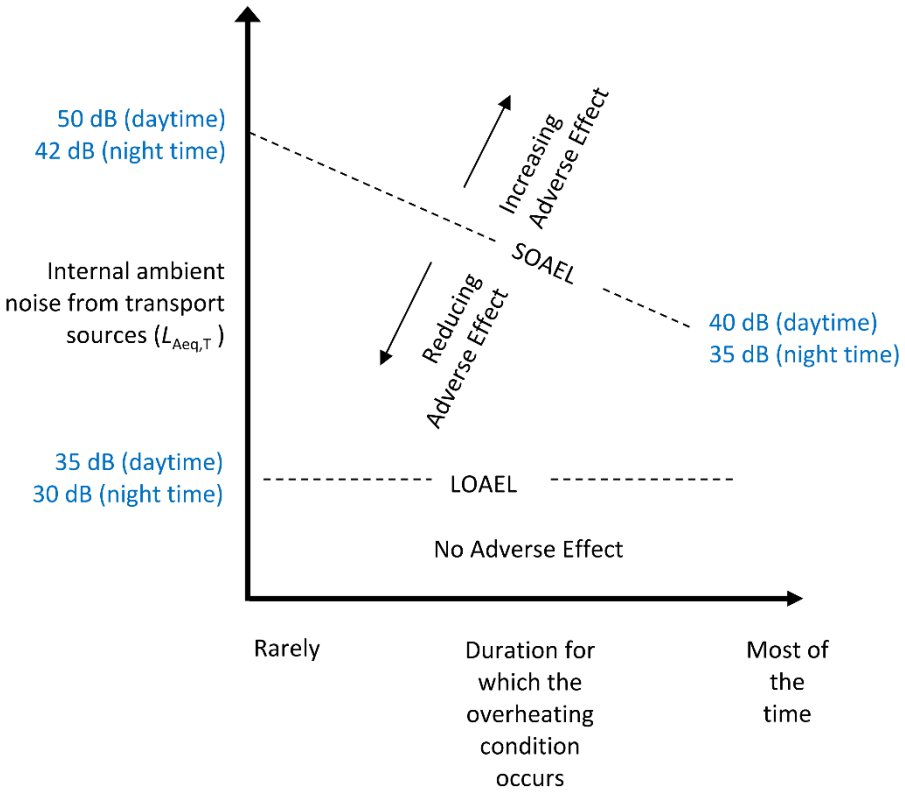

Figure 4 Internal ambient noise levels and increasing adverse effects for an overheating condition

When internal noise levels are above Significant Observed Adverse Effect Level (SOAEL), it is likely that there will be a high potential for an adverse outcome. These adverse outcomes will include:

- Material change in behaviour and/or attitude, eg avoiding certain activities during periods of intrusion
- Where there is no alternative ventilation, having to keep windows closed most of the time because of the noise
- Potential for sleep disturbance and difficulty in getting back to sleep
- Quality of life diminished.

As illustrated, the potential for adverse risk increases with the duration of exposure to noise, ie, a shorter exposure will result in a lower risk of adverse outcomes.

4.5 Tactile vibration criteria

4.5.1 Standard guidance

Tactile vibration is that which is perceived as mechanical motion. BS 6472-1:2008 *Guide to Evaluation of Human Exposure to Vibration in Buildings Part 1: Vibration Sources Other Than Blasting* provides procedures for assessing the potential human response to vibration.

Vibration is assessed in terms of the equivalent vibration dose value (VDV). This relates the level and duration of vibration.

The BS 6472-1:2008 assessment criteria are presented in Table 5.

Table 5 BS 6472-1: 2008 tactile vibration assessment criteria

VDV ($m/s^{1.75}$) above which might result in various probabilities of adverse comment within residential buildings.			
Place	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential buildings 16 hr day	0.2 – 0.4	0.4 – 0.8	0.8 – 1.6
Residential building 8 hr night	0.1 – 0.2	0.2 – 0.4	0.4 – 0.8

It is important to note that people exhibit wide variations of vibration tolerance. Specific values are dependent upon social and cultural factors, psychological attitudes and expected degree of intrusion.

4.6 Re-radiated noise criteria

4.6.1 Standard guidance

There is currently no international or British Standard which provides guidance on assessing the impact of ground-borne noise from railways on the occupants of a building. The Association of Noise Consultants (ANC) guidelines '*Measurement and assessment of ground-borne noise and vibration*', 2nd edition published in 2012, is generally used as the basis of assessments such as this.

This document also provides discussion on the relevant research that has been carried out, and a summary of typically adopted criteria.

The most relevant items are set out below:

- The American Public Transit Association (APTA) guidelines recommend criteria of between 30 and 40 dB(A) depending on the density and type of residential properties.

They do not define where within a building these apply, or the time response that should be used.

- The Federal Transit Administration (FTA) of the US Department of Transportation, recommends limits for maximum pass-by levels of 35 dB(A) for frequent events (more than 70 events per day) and 43 dB(A) for infrequent events.
- London Underground Limited has studied the relationship between ground-borne noise levels and complaint thresholds. This was used to define a complaint threshold of L_{Amax} 40 dB.
- The ANC guidelines also note that Local Authority guidelines for ground-borne noise were published in London and the South East, and state a limit of L_{AFmax} 35 dB.

In all the above examples, the time constant is not defined, with the exception of the Local Authority guidelines in London and the South East, which is defined as having a fast time weighting.

It should be noted that most of this research relates to residential accommodation and is aimed at providing good sleeping/resting conditions.

5 Survey method

5.1 Noise survey method

The survey included attended noise measurements.

Attended sample noise measurements were taken by Kane Mitchell and Thomas Dent at several locations around the site. These are indicated in Figure 2 as positions ‘L1’ to ‘L6’.

The daytime noise and vibration survey was carried out on 18 December 2019 and the night-time noise survey was carried out on 9 January 2020.

At each position the microphone was mounted on a tripod approximately 1.5 m above the ground level and at least 1 m from any other reflective surface.

Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

5.2 Vibration survey method

Vibration measurements were taken at location ‘L4’ per Figure 2.

The measurements were taken on 18 December 2019 by Kane Mitchell and Thomas Dent. Measurement periods containing multiple events were obtained during the survey.

Vibration time histories were recorded using a tri-axial accelerometer and data recorder. The accelerometers were arranged on a mounting block that was connected to a solid ground

surface. A metal washer was fixed to the slab using a thin layer of epoxy adhesive with the mounting block attached to the washer.

The vibration measurements were conducted in three axes as follows at 'L4':

- X-axis – Horizontal vibration perpendicular to Rochdale Road
- Y-axis – Horizontal vibration parallel to Rochdale road
- Z-axis – Vertical vibration.

Details of the equipment used and the noise indices measured are provided in Appendix A.

5.3 Weather conditions

Weather conditions during the survey are described in Appendix A.

6 Measurement results

6.1 Observations

6.1.1 Noise

The dominant noise source occurring during the measurements at locations 'L1', 'L2' and 'L3' was traffic noise from Rochdale Road.

At locations 'L4' and 'L5' the dominant noise source was traffic noise from Queens Road.

Less significant noise sources were passing pedestrians and bird song.

6.1.2 Vibration

Subjectively there was no perceived vibration at the measurement location.

6.2 Noise measurement results

6.2.1 Attended measurement results at measurement location 'L2'

Noise levels recorded during the continuous attended measurements at location 'L2' are summarised in Table 6.

The dominant noise source during these measurements was constant traffic passing along Rochdale Road. Max noise levels were the result of car horns and passing HGVs/buses. Train horns were also clearly audible however these were infrequent, occurring approximately every 15 minutes.

Table 6 Noise levels and key noise sources from attended measurements

Location	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
2	11:00	71	77	60
2	11:05	73	93	61
2	11:10	71	78	60
2	11:15	72	88	61
2	11:20	71	82	58
2	11:25	72	91	61
2	11:30	71	77	63
2	11:35	71	80	62
2	11:40	71	78	62
2	11:45	71	78	61
2	11:50	71	78	63
2	11:55	72	91	61
2	12:00	71	79	62
2	12:05	70	77	58
2	12:10	71	80	61
2	12:15	71	80	63
2	12:20	72	79	62
2	12:25	70	78	60
2	12:30	71	78	62
2	12:35	71	77	63
2	12:40	70	78	58
2	12:45	71	78	62
2	12:50	71	79	61
2	12:55	72	77	63

Location	Start time	Sound pressure levels (dB)		
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$
2	13:00	71	81	63
2	13:05	71	82	61
2	13:10	71	79	61
2	13:15	70	77	57
2	13:20	72	77	66
2	13:25	71	79	62
2	13:30	72	80	65
2	13:35	72	79	67
2	13:40	70	77	58
2	13:45	71	77	64
2	13:50	71	78	63
2	13:55	71	78	61

6.2.2 Attended measurement results elsewhere

Daytime noise levels and key sources recorded during the attended measurements at locations 'L1' and 'L3-L6' are summarised in Table 7.

Table 7 Daytime noise levels and key noise sources from attended measurements

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	11:55	74	89	63	Traffic noise from Rochdale Road. Maxes resulting from passing HVGs and buses.
1	12:00	73	83	61	
1	12:05	71	84	59	
1	13:15	72	81	58	
1	13:20	71	80	62	
1	13:25	72	82	61	

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
3	11:00	59	78	53	Traffic noise from Rochdale Road.
3	11:05	58	75	52	Maxes resulting from passing vehicles and train horns
3	11:10	55	67	51	
3	12:20	54	68	52	
3	12:25	53	58	51	
3	12:30	54	64	52	
4	11:20	56	75	53	Traffic noise from Rochdale Road.
4	11:25	56	76	53	Maxes resulting from passing vehicles and train horns
4	11:30	59	79	54	
4	12:40	57	74	54	Traffic noise from Rochdale Road.
4	12:45	56	71	54	Maxes resulting from passing vehicles
4	12:50	55	69	54	
5	11:35	72	81	59	Traffic noise from Queens Road.
5	11:40	75	86	66	Maxes resulting from sirens of passing emergency vehicles
5	11:45	78	103	66	
5	12:55	72	89	63	Traffic noise from Queens Road.
5	13:00	71	79	63	Maxes resulting from sirens of passing emergency vehicles and HGVs
5	13:05	73	88	61	
6	14:05	57	74	50	Traffic noise from Collyhurst Road,
6	14:10	56	71	50	Maxes resulting from tram passes.

Night-time noise levels and key sources recorded during the attended measurements at locations 'L1' and 'L3-L6' are summarised in Table 8

Table 8 Daytime noise levels and key noise sources from attended measurements

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
1	23:25	66	82	50	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing buses. Occasional faint car horns from Queens Road.
1	23:30	67	81	47	
1	23:35	66	81	49	
1	00:25	63	77	47	
1	00:30	65	80	50	
1	00:35	64	77	51	
2	23:45	65	76	46	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing buses. Occasional passing cars with music playing loudly.
2	23:50	64	76	47	
2	23:55	64	77	45	
2	00:05	65	78	47	
2	00:10	66	79	48	
2	00:15	65	78	46	
3	00:05	50	61	45	Intermittent traffic noise along Rochdale Road. Maxes resulting from passing vehicles along Thornton Street. Max noise level at 23:55 resulting from a passing vehicle playing loud music.
3	00:10	49	58	43	
3	00:15	48	60	41	
3	23:45	49	57	44	
3	23:50	48	56	42	
3	23:55	54	78	42	
4	00:25	47	70	42	Intermittent traffic noise

Location	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
4	00:30	46	60	42	predominantly from Rochdale Road.
4	00:35	46	59	40	Maxes resulting from vehicles passing along both Rochdale Road and Queens Road.
4	23:05	49	52	47	
4	23:10	48	55	46	
4	23:15	49	65	45	Max noise level at 00:35 resulting from a vehicle passing along Stretton Close.
5	00:40	66	84	42	Intermittent traffic noise along Queens Road.
5	00:45	68	86	44	Maxes resulting from passing buses and HGVs.
5	00:50	68	83	43	
5	23:25	69	81	51	Tram passes also audible, occurring once approximately every 10 minutes.
5	23:30	69	80	45	
5	23:35	67	80	46	
6	23:05	48	61	45	Intermittent traffic noise along Collyhurst Road.
6	23:10	56	84	45	Maxes resulting from tram passes which occurred approximately once every 10 minutes.
6	23:15	47	62	44	
6	00:45	48	63	40	
6	00:50	47	56	44	
6	00:55	47	65	39	

6.3 Vibration measurement results

VDVs were also measured at location 'L4' as per Figure 1 and are presented in Table 9. The maximum VDVs measured for each of the directions are highlighted in red.

Table 9 VDVs measured at location 'L4'

Start time	Duration (min)	VDV ($m/s^{1.75}$)		
		X	Y	Z
14:55	15	0.033406	0.008295	0.003998
15:10	15	0.038807	0.008402	0.004031
15:25	15	0.041115	0.010918	0.004515
15:40	15	0.045757	0.011448	0.004429

7 Control of plant noise egress

7.1 Basic limits

Based on the above criteria and the measurement results, the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 10.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels. These have been corrected relative to the measured free-field background noise levels by the addition of 3 dB.

Table 10 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
NSP1 Properties along Thornton Street North	49	39
NSP2 Properties along Stretton Close	51	38
NSP3 Properties along Rochdale Road	56	45
NSP4 Church of the Saviour church and school	55	43

The limits set out in Table 10 do not include any attention catching features. The penalty corrections for attention catching features may be significant and will need to be considered as the building services design progresses. This is discussed in Appendix B.

7.2 Plant noise assessment

All building services plant will be designed to achieve the noise limits set out above, including any corrections for attention catching features. At this stage, no information is available in relation to the proposed plant. This will need to be assessed as the design progresses.

8 Facade sound insulation – noise ingress

This section describes an assessment of facade sound insulation to control noise ingress. The required facade specification largely depends on the external noise levels and the internal noise criteria.

The following assessment is based on achieving the internal noise levels recommended in BS 8233 and by Manchester City Council, which are set out in Section 4.

8.1 External noise levels

The external noise level zones indicating the predicted external noise levels at the facades of the proposed development for daytime and night-time are shown in Table 11.

Table 11 External noise level zones

External noise level zone	Predicted daytime (07:00-23:00) noise level, L_{Aeq} (dB)	Predicted night-time (23:00- 07:00) noise level, L_{Aeq} (dB)	Predicted night-time maximum noise level not normally exceeded, L_{AFmax} (dB)
1	76-80	66-70	80
2	71-75	61-65	75
3	66-70	56-60	70
4	61-65	51-55	65
5	≤60	≤50	≤60

8.2 Facade sound insulation

Minimum facade sound insulation requirements for the facades are given in Table 12. These have been determined to achieve the internal noise criteria for bedrooms and living areas using predicted external noise levels at the facades.

At this site, the facade performance requirements are driven by the daytime ambient noise levels.

Table 12 Facade sound insulation performance requirements

Facade	Overall sound insulation performance, R'_w+C_{tr} (dB)	
	Living rooms	Bedrooms
1	45	45
2	40	40
3	35	35
4	30	30
5	25	25

8.3 Guidance on facade construction, glazing, and ventilation strategy

Table 13 sets out some examples of glazing configurations and ventilation strategies that could achieve the required sound insulation performances.

Table 13 Example glazing configurations and ventilation strategies for overall facade sound insulation

Overall facade sound insulation, R'_w+C_{tr} (dB)	Example glazing configuration	Ventilation strategy
25-27	6 mm glass/16 mm cavity/6 mm glass	Acoustically attenuated passive ventilation (eg, trickle vents)
28-29	6.8 mm acoustic laminate/16 mm cavity /6 mm glass	Acoustically attenuated passive ventilation (eg, trickle vents)
30-32	8.8 mm acoustic laminate /16 mm cavity/6 mm glass	Acoustically attenuated passive ventilation (eg, trickle vents)
33-35	8.8 mm acoustic laminate/16 mm/10 mm glass	High performance acoustically attenuated passive ventilation
36-38	8.8 mm acoustic laminate/16 mm/10 mm glass	Mechanical ventilation (eg, whole house ventilation)
39-41	12.8 mm acoustic laminate/20 mm/10 mm glass	Mechanical ventilation (eg, whole house ventilation)
42-45	This represents a very high sound insulation performance. For higher performances, thicker acoustic laminate glazing with wider air spaces can be used. A substantial non-glazed facade construction, limited glazing area, and mechanical ventilation is likely to be required.	

The performance required by each element will depend on the relative areas of glazed and non-glazed elements, and the ventilation strategy. If applicable, this includes the acoustic performance of trickle ventilators and the number of ventilators per room. As a guide, for a mechanically ventilated room with a 50% glazed facade, the glazing sound insulation requirement would typically be 3 dB lower than the overall facade sound insulation requirement. This is provided the non-glazed external wall elements provide at least 10 dB more sound insulation than the glazed elements.

A more detailed facade assessment will be needed as the design develops to ensure the overall performance requirements are met.

Table 14 Example glazing configurations

Glazing sound insulation, R'_w+C_{tr} (dB)	Example glazing configuration
27	6 mm glass/16 mm cavity/6 mm glass
29-31	8 mm glass/16 mm cavity/6 mm glass
33	6.8 mm acoustic laminate glass/16 mm cavity/6 mm glass
35	8.8 mm acoustic laminate glass/16 mm cavity/6 mm glass
37-39	8.8 mm acoustic laminate glass/16 mm cavity/10 mm glass
41	8.8 mm acoustic laminate glass/16 mm cavity/12.8 mm acoustic laminate glass
42-45	10.8 mm acoustic laminate glass/24 mm cavity/16.8 mm acoustic laminate glass

8.4 Acoustics, ventilation and overheating assessment

8.4.1 Level 1 assessment

A Level 1 assessment of noise ingress during an overheating condition has been carried out in line with Association of Noise Consultants *Acoustics Ventilation and Overheating, residential Design Guide*.

The Level 1 assessment has been carried out based on the external noise levels as per Table 11 and the relevant criteria as per Table 3.

The results of this assessment indicate that the proposed development falls into the medium and high risk categories depending on the facade location and therefore a Level 2 assessment is required.

8.4.2 Proposed ventilation strategy

Mechanical ventilation via MVHR units is proposed for all houses and apartments

8.4.3 Recommendations

A Level 2 assessment should be undertaken as the design progresses, when a TM59 assessment which details the duration and frequency of overheating periods is available for review.

It should be investigated if mechanical ventilation via MVHR units will be suitable for controlling summertime overheating. If mechanical ventilation alone would not be sufficient

an option of ventilative cooling via acoustically attenuated operable passive ventilation (eg, openable louvres with acoustically attenuating splitters/baffles) may need to be investigated. A more detailed assessment would involve the following:

- Duration of period where additional ventilative cooling is required (to be assessed by others, typically part of a CIBSE TM59 assessment)
- How wide the external windows would need to be open to control overheating (to be assessed by others, typically part of a CIBSE TM59 assessment)
- Acoustic attenuation required to minimise adverse noise ingress and associated disturbance.

Other measures can be taken to reduce the risk of overheating, and in turn noise ingress to the building, these would include the following:

- Restricting the size of external windows
- Solar shading to external glazing
- External blinds.

9 External amenity areas

The residential dwellings (excluding apartment blocks) are to have gardens. In addition, a park is proposed to the east of the site as part of the development.

Noise levels within gardens are expected to exceed the upper guideline value of L_{Aeq} 55 dB during the daytime at all locations.

Nosie levels within gardens located adjacent to facades in zone 4 would be expected to exceed the lower guideline value of L_{Aeq} 50 dB during the night-time but be below with the upper guideline value of L_{Aeq} 55 dB.

Noise levels within gardens located adjacent to facades in zone 5 would be expected to be below the lower guideline value of L_{Aeq} 50 dB during the night-time

Noise levels within the park to the south of the site are expected to range between L_{Aeq} 60-65 dB during the daytime and L_{Aeq} 50-55 dB during the night-time.

Though in most instances, the upper guideline value is predicted to be exceeded, this is not expected to have a significant negative impact on the uses of the spaces.

10 Entertainment noise egress

10.1.1 Operational noise egress limits

The cumulative noise level resulting from amplified sound egress at 1 m from the most affected windows of the nearest noise sensitive premises should not exceed 10 dB below the existing background sound level in octave bands. These limits set out in Table 15.

Table 15 Maximum operational noise limits at 1 m from noise sensitive premises

Period	Maximum operational noise limits at 1 m from noise sensitive premises, L_{eq} (dB) Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Daytime (07:00 – 23:00)	56	49	46	45	48	43	31
Night-time (23:00 – 07:00)	43	40	34	33	36	30	24

10.1.2 Nosie sensitive premises

The nearest noise sensitive premise is the proposed residential dwelling located approximately 15 m to the east of the commercial unit facade.

10.2 Operational noise limits

The maximum operational noise levels (L_{eq}) from amplified sound within the proposed commercial unit are set out in Table 16.

These are based on the following:

- Meeting the daytime noise egress criteria set out in Section 4.3.3
- A minimum overall facade sound insulation performance of R'_w+C_{tr} 28 dB
- Meeting the noise transfer criteria for the residential apartments above set out in Section 4.3.3
- A minimum first floor sound insulation performance of $D_{nT,w}+C_{tr}$ 50 dB.

The limits are provided for guidance only as in practice, there will be some variation in background noise levels within the office space. The exact amplified noise limits should be determined in-situ along with setting of electronic limiters. These limits would typically be included in a tenant lease agreement in order to control noise egress and noise transfer.

Table 16 Maximum operational noise limits in the apartment block A commercial unit

	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Maximum operational noise limits in the ground floor retail unit, L_{eq} (dB)	86	78	63	62	64	66	69

The above limits would be suitable for low level amplified background music. The limits are driven by noise transfer.

If noise levels higher than those noted above were desirable, additional enhancement works would be required in order to ensure that the Manchester City Council criteria are still met. Typical enhancement works would be expected to include:

- An enhanced floor / ceiling construction with flanking pathways suitably controlled
- Enhancements to external glazing
- Enhancements to the non-glazed elements of the facade
- Lobbied external doors.

11 Ground-borne vibration ingress assessment

As trams operate at a reduced level / not at all during the night-time, the daytime vibration levels are considered a worst-case scenario. The daytime vibration levels have been assessed for the daytime and night-time as a worst case scenario and to protect against the possibility of change in tram timetables in the future.

11.1 Tactile vibration

Table 9 presents a summary of the maximum vibration dose values measured for each axis. These measurements are considered representative of the vibration levels to be experienced by the proposed development.

Table 17 Vibration dose values measured at location 'L4'

Maximum measured VDV ($m/s^{1.75}$)		
X	Y	Z
0.045757	0.011448	0.004515

The above VDVs are all below the BS 6472 criteria for 'low probability of adverse comment' stated in section 4.5.

Levels experienced may vary depending on the type of train and position of the future buildings. However, the measured vibration levels were below the lowest BS 6472 threshold, and a significant increase in the number of trams would be required for the threshold to be exceeded. Based on this, tactile vibration due to trains is unlikely to be problematic for this development.

In addition, these measurements were undertaken at a worst case location, it is expected that for many of the proposed residential dwellings, the vibration dose values will likely be lower than those presented in Table 17.

11.2 Re-radiated noise

An assessment of re-radiated ground-borne noise has been undertaken, the results of which indicate that predicted levels of re-radiated noise are expected to be negligible and below the recommended criteria as per Section 4.6.

On this basis, re-radiated ground-borne noise in the proposed residences is unlikely to result in adverse comment. As the predicted values are for worst case ground floor conditions, noise levels from this source are expected to be lower at upper floor levels.

12 Conclusion

The lowest measured background sound levels measured during the survey were:

- NSP1 Residential dwellings along Thornton Street North - $L_{A90,5min}$ 51 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 41 dB during the night-time (23:00-07:00)
- NSP2 Residential dwellings along Stretton Close - $L_{A90,5min}$ 53 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 40 dB during the night-time (23:00-07:00)
- NSP3 Residential dwellings along Rochdale Road - $L_{A90,5min}$ 58 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 47 dB during the night-time (23:00-07:00)
- NSP4 Church of the Saviour church and school - $L_{A90,5min}$ 57 dB during the daytime (07:00-23:00) and $L_{A90,5min}$ 45 dB during the night-time (23:00-07:00).

Based on the requirements of the Manchester City Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed:

- NSP1 Residential dwellings along Thornton Street North - $L_{Aeq,15min}$ 49 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 39 dB during the night-time (23:00-07:00)
- NSP2 Residential dwellings along Stretton Close - $L_{Aeq,15min}$ 51 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 38 dB during the night-time (23:00-07:00)
- NSP3 Residential dwellings along Rochdale Road - $L_{Aeq,15min}$ 56 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 45 dB during the night-time (23:00-07:00)

- NSP4 Church of the Saviour church and school - $L_{Aeq,15min}$ 55 dB during the daytime (07:00-23:00) and $L_{Aeq,15min}$ 43 dB during the night-time (23:00-07:00).

The overall sound insulation requirements range between R'_w+C_{tr} 25 dB and R'_w+C_{tr} 45 dB depending on the location of the facade. Ventilation may be provided in the form of either acoustically attenuated passive ventilation or mechanical ventilation, depending on the facade location.

A level 1 acoustics, ventilation and overheating assessment has been undertaken, the results of which indicate a level 2 assessment is required. This will be carried out once a TM59 assessment is available for review.

An assessment of noise levels in external amenity spaces has been undertaken, the results of which indicate that the upper guideline value is predicted to be exceeded in most locations, though this is not expected to have a significant negative impact on the uses of the spaces.

Internal noise limits have been set for the proposed commercial unit in order to ensure entertainment noise egress and transfer are adequately controlled.

The vibration assessment indicates that re-radiated noise and tactile vibration are expected to be below their respective criteria.

Appendix A

Survey details

Equipment

Calibration details for the equipment used during the surveys are provided in Table A1.

Table A1 Calibration information

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Data Recorder	DA-20/10870889	Rion	11 Sep 21	TCRT19/1712
Accelerometer	PV-87/33827	Rion	10 Sep 21	TCRT19/1708
Accelerometer	PV-87/74274	Rion	9 Dec 21	TCRT19/1707
Accelerometer	PV-87/33829	Rion	9 Sep 21	TCRT19/1706
Vibration Calibrator	AT01/3015	AP Technology	10 Sep 21	TCRT19/1709
Sound level meter	2250/3011964	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Microphone	4189/3100176	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Pre-amp	ZC0032/26376	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Calibrator	4231/3019123	Brüel & Kjær	3 Sep 21	UCRT19/1969
Sound level meter	NL-52/00932326	Rion	13 Mar 21	TCRT19/1179
Microphone	UC-59/05549	Rion	13 Mar 21	TCRT19/1179
Pre-amp	NH-25/32354	Rion	13 Mar 21	TCRT19/1179
Calibrator	NC-74/34125432	Rion	13 Mar 21	TCRT19/1178

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

During the attended noise measurements, the weather was generally clear and dry and no rain occurred.

These weather conditions are considered suitable for obtaining representative measurements.

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Appendix B

BS 4142 corrections for attention catching features

The following applies where plant noise is assessed in accordance with BS 4142:2014+A1:2019.

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), penalty corrections should be applied based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible.

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible.

For noise which is equally both impulsive and tonal, then both features can be accounted for by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

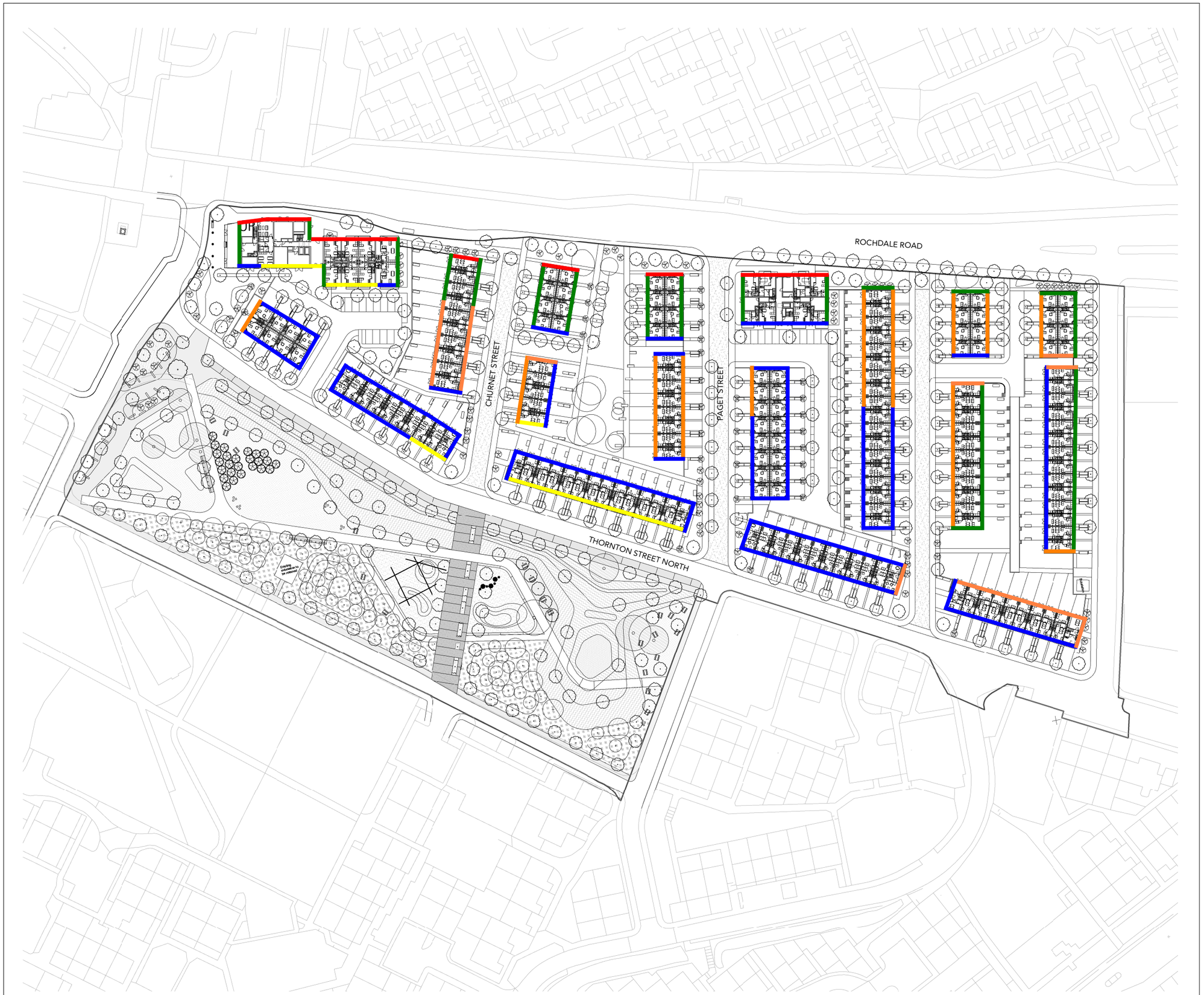
If a subjective assessment of tonality is not appropriate, an objective assessment can be made by analysis of time-averaged, third-octave band sound pressure levels. A noise source is deemed to be tonal if the level in a third-octave band exceeds the level in adjacent third-octave bands by the level differences given below:

- 15 dB in the low frequency third-octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency third-octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency third-octave bands (500 Hz to 10000 Hz).

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

Appendix C

Facade zone mark-ups



Title	Daytime external noise level mark-ups
Project	Collyhurst Village
Project no.	19514
Version	B
Marked-up by	Kane Mitchell
Reviewed by	Matthew Robinson
Date	4 December 2020

Mark-up for calculated external noise levels

Facade zone	Daytime ambient noise level $L_{Aeq,16h}$ (dB)
1	76-80
2	71-75
3	66-70
4	61-65
5	≤ 60

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Rev	Date	Intls	Details
P5	02/12/20	LH	Updated 2 Apartment Block Scheme
P4	27/10/20	LH	Red Line Boundary Updated
P3	30/09/20	LH	EIA Issue
P2	11/09/20	LH	EIA Issue
P1	17/04/20	GC	Stage 2 Issue
P0	09/04/20	GC	Tenure Update

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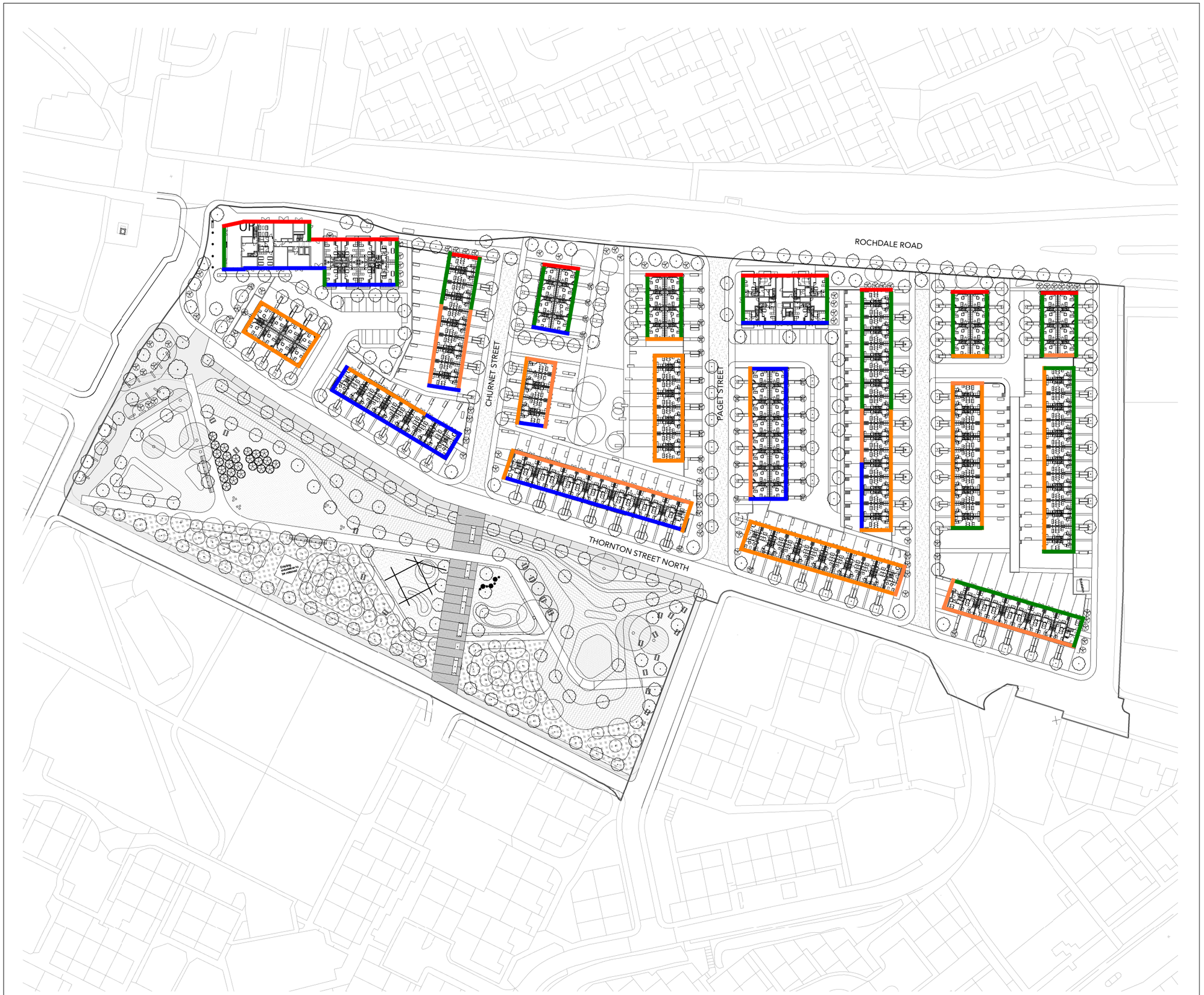
Project Title	Collyhurst Housing
Client	FEC
Location	Manchester
Drawing Title	Proposed Site Location Plan

Date	02/12/2020 17:26:12	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8871-BA-MP-00-DR-A- (04)706- P5



Title	Night-time external noise level mark-ups
Project	Collyhurst Village
Project no.	19514
Version	B
Marked-up by	Kane Mitchell
Reviewed by	Matthew Robinson
Date	4 December 2020

Mark-up for calculated external noise levels

Facade zone	Night-time ambient noise level $L_{Aeq,\ 8h}$ (dB)	Night-time maximum noise level L_{AFmax} (dB)
1	66-70	80
2	61-65	75
3	56-60	70
4	51-55	65
5	≤ 50	≤ 60

SANDY BROWN
Consultants in Acoustics, Noise & Vibration

Rev	Date	Intls	Details
P5	02/12/20	LH	Updated 2 Apartment Block Scheme
P4	27/10/20	LH	Red Line Boundary Updated
P3	30/09/20	LH	EIA Issue
P2	11/09/20	LH	EIA Issue
P1	17/04/20	GC	Stage 2 Issue
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Project Title	Collyhurst Housing
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Location	Manchester
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Date	02/12/2020 17:26:12	**Scale**	1 : 1250
Checked	GC	**Orig Paper Size**	A3
Job No:	**8871**	**Status**	**PRELIMINARY**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8871-BA-MP-00-DR-A- (04)706- P5

Far East Consortium

Environmental Standards Statement

Collyhurst Village Site, Rochdale Road, Manchester

27 January 2021

Daniel Watt
CIBSE Accreditation Nos:
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LCEA084077

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1. Executive Summary

This Environmental Standards Statement has been prepared by Watt Energy on behalf of DeTrafford Estates to support a planning application for the development of Phoenix Works. The statement specifically addresses the following Manchester Council approved climate change action plans in addition to planning policies, as stipulated in the Manchester Core Strategy (July 2012):

- Guide to Development in Manchester SPD (1007)
- Our Manchester Strategy 2016-2025
- Manchester: A Certain Future (2013)
- Manchester Climate Change Board – The Zero Carbon Framework 2020-2038
- Climate Change and Low Emissions Implementation Plan 2016-2020
- Meeting Our Objectives and Targets – Manchester Climate Change Framework – 2020-25
- Manchester Residential Quality Guidance
- Core Strategy Policy DM 1 - Development Management
- Core Strategy Policy EN 4 - Reducing CO2 Emissions by Enabling Low and Zero Carbon Development
- Core Strategy Policy EN 6 - Target Framework for CO2 Reductions from Low or Zero Carbon Energy Supplies
- Core Strategy Policy EN 8 – Adaptation to Climate Change
- Core Strategy Policy EN 9 – Green Infrastructure
- Core Strategy Policy EN 14 – Flood Risk
- Core Strategy Policy EN 15 – Biodiversity and Geological Conservation
- Core Strategy Policy T 1 – Sustainable Transport

The statement details how the development will incorporate sustainable design and resource efficiency in line with the Energy Hierarchy, so to meet the policy requirements and council targets whilst reducing its overall environmental impact. The methodology and calculations are consistent with the MCC Appendix A EN6 Energy Target Explanation and all figures used within this report have been based on the most recent issue of drawings and modelled using SAP 2012 to accurately predict Energy Usage and CO_2 reductions.

In relation to the planning documents and policies outlined above, the development is required to achieve a 9% reduction in carbon emissions over Part L 2013 of the Building Regulations and also aim for a status of Carbon Neutral.

In order to achieve compliance the development has been designed with a holistic low energy design concept involving a fabric first approach. The U-values, design air permeability and ventilation targets all aspire to Passive House design standards along with the consideration and application of low zero carbon renewable technologies.

Following the LZC feasibility assessment, it is proposed that the development will also benefit from a site wide 16kWp PV array.

As a result of the above the predicted site wide reduction in CO_2 over Part L 2013 of the Building Regulations can be summarised as

- 20.6% with SAP 9 carbon factors
- 41.4% with SAP 10.0 carbon factors
- 64.6% with SAP 10.1 carbon factors

The above figures include a renewable energy contribution of 1.6%. These are in addition to the total on-site energy being provided by a 100% renewable energy electricity provider therefore classifying the development as both Low Carbon and Carbon Neutral.

This statement also examines how the design, specification and characteristics of the proposal will contribute to sustainability and meet the relevant objectives outlined within the National Planning Policy Framework (NPPF) 2019, in addition to the Manchester Council approved climate change action plans and core strategy planning policies outlined above. The sustainability measures assessed included:

- Flood Risk Zone
- Green and Blue Infrastructure
- Sustainable Drainage Systems (SUDs)
- Biodiversity / Ecology
- Internal Water Efficiency
- Waste Management
- Materials
- Pollution Control
- Health and Wellbeing
- Sustainable Transport

The development therefore complies with all Manchester City Council's current and future policy requirements and planning targets.

2. Planning Statement

The following statement relates to the proposed development at Collyhurst Village Site, Rochdale Road, Manchester.

2.1 The Site and Proposed Development

The site is located north west of the City of Manchester, along Rochdale Road within the Collyhurst area. The site occupies approximately 2.68 hectares of land. A site location plan, with the site's extents denoted by the red outline seen in Figure 1 (shown later in this subsection).

The site is bounded to the west by Rochdale Road, Thornton Street N and Stretton Close to the east and Shellard Road to the south. Notable nearby developments which are currently under consideration/ construction/ completed are 114860/FO/2016 located 1km southwest, 121401/FO/2018 and 125596/FO/2019 located 940m and 970m southeast, respectively. To the south of the site 126467/FO/2020, 124738/FO/2019, 123887/FO/2019 and 123735/FO/2019 can be found at distances of 620m, 750m, 1.2km and 1.4km, respectively.

The site is located in area that is currently occupied by 28no residential dwellings and a shop.

The development being applied for is the Erection of a residential-led mixed use development comprising 2 no. apartment blocks both reaching 6 storeys, to form 76 residential single storey apartments and duplex apartments (Use Class C3), four plots with a mixture of 2 bed, 3 bed, 4 bed and 5 bed townhouse (Use Class C3) to form 168 houses. These are in addition with commercial accommodation (292.5 sqm) (Use Classes A1,A2,A3,A4,A5,B1, D1 and D2)); and associated residential amenity areas, refuse storage, plant (including substation), car parking, cycle storage, external circulation and extensive landscaping.

Figure 1 below shows the location of the site and surrounding development areas.

Figure 1: Site Location Plan

Table 1 below sets out a schedule of the accommodation.

Area Use	Quantum
Residential Units (Use Class C3)	HT01 2B4P: 56 HT02 3B5P: 88 HT03 4B6P: 17 HT04 4B6P: 6 HT05 5B7P : 1 HT06 3B5P: 1 1 Bed Apartments: 18 2 Bed Apartments: 40 3 Bed apartments: 2 2 Bed Duplex Apartments: 12

	3 Bed Duplex Apartments: 4 Total: 244
Ground floor commercial floor space (Use Classes A1-A5, B1, D1 and D2)	292.5m^2 (Net Internal Area (NIA))

Table 1: Schedule of Accommodation

2.2 Relevant Policies and Guidance

2.2.1 Local Planning Policy

2.2.1.1 Manchester Core Strategy

Manchester's Core Strategy (CS) was adopted on 11th July 2012 and is the key Development Plan Document (DPD) guiding the measures assessed in this report.

CS Policy DM 1 - Development Management: Stipulates that all new development should have regard for several development principles relevant to sustainability, including: waste management, designing for health, flood risk, green infrastructure, biodiversity. Additionally, subject to scheme viability, developers will be required to demonstrate that new non-domestic development will achieve a BREEAM Rating of 'Very Good' or for domestic development to achieve the Code for Sustainable Homes standard.

CS Policy EN 4 – Reducing CO2 Emissions: This policy targets the reducing of CO2 emissions through the following of the energy hierarchy; firstly reducing the need for energy through efficient design measures, followed by clean energy and lastly, the application of renewable or LZC technologies. In addition to this point, MCC state within this policy all new development is required to use building materials that have low embodied carbon.

CS Policy EN 6 - Target Framework for CO2 Reductions from Low or Zero Carbon Energy Supplies: This Policy requires electricity intense residential development of 10 or more units to meet, as a minimum, a 15% reduction in domestic CO2 emissions over Part L of the 2010 Building Regulations, unless proven to be unviable. As Part L 2013 of the Building Regulations represents a 6% improvement on 2010 levels, this target is subsequently equivalent to a 9% improvement in CO2 emissions over Part L 2013. Section 2.3 provides evidence of how this target is achieved.

CS Policy EN 8 – Adaptation to Climate Change: Expects all new development to be adaptable to climate change in terms of its design, layout, siting, and function of both building associated external spaces.

CS Policy EN 9 – Green Infrastructure: Requires new developments to maintain existing green infrastructure whilst using every opportunity, in accordance with current Green Infrastructure Strategies, to enhance the quality and quantity of green infrastructure, improve the performance of its functions and create and improve linkages to and between area of green infrastructure.

CS Policy EN 14 – Flood Risk: This policy expects all new developments to minimise surface water run-off through the use of SUDs and Green Infrastructure.

CS Policy EN 15 – Biodiversity and Geological Enhancement: Developers will be expected to identify and implement reasonable opportunities to enhance, restore or create new biodiversity, either on or adjacent to the proposed site.

CS Policy T 1 – Sustainable Transport: Policy aims to deliver sustainable, high quality, integrated transport systems to encourage a shift away from car travel to public transport, cycling and walking.

2.2.1.2 Guide to Development in Manchester., Supplementary Planning Document

The Development Guide in Manchester Supplementary Planning Documents (SPD) establish and set out the ongoing generation of the City by providing a set of set principles which will guide developers, architects, and residents in the design of the city. The MCC Core Strategy stipulates that all new residential developments should comply with the design guidance set out in the SPDs. These principles include the following environmental standards relevant to this report: energy strategy, water consumption, drainage management, weather resilience, waste management, construction management, biodiversity, and waterways.

2.2.1.3 Manchester Residential Quality Guide

The Manchester Residential Quality Guide has been developed to help shape the creation of new homes and communities across the Greater Manchester city region, beginning with the Centre and its immediate surroundings. This document outlines the considerations, qualities, and opportunities that will help to deliver high quality residential development as part of successful and sustainable neighbourhoods across Manchester. The guidance includes the following nine components:

Make it Manchester – developers must understand the city's unique character, heritage old and new, density and scale in various parts of the city and appreciate how new homes will fit in to what's already there.

Make it bring people together – new homes must encourage a sense of community and neighborliness, offering a mix of tenures to promote a mix of people.

Make it animate streets and spaces – understand the relationship between new homes and its environment and create public space.

Make it easy to get around – make sure developments have good transport links, along with good walking and cycling provision.

Make work with the landscape – development should improve the connection with the local environment with improved biodiversity, as well as greening and water schemes.

Make it practical – dealing with waste, car parking, bike storage and visitors should be made as easy as possible.

Make it future proof – design must anticipate the impacts of climate change and extreme weather with efficient design and adaptability.

Make it a home – sufficient space, natural light, privacy and storage are essential for people to settle down and flourish.

Make it happen – ensuring proposals are delivered, to a high quality, with high design standards and high sustainability.

2.2.1.4 Manchester's Great Outdoors

A Green and Blue Infrastructure Strategy for Manchester aims to invest to date in the city's Green and Blue infrastructure over the next 10 years (by 2025). Four objectives have been established to enable the vision to be achieved: 1. Improve the quality and function of existing green and blue Infrastructure, to maximize the benefits it delivers. 2. Use appropriate green and blue infrastructure as a key component of new developments to help create successful neighborhoods and support the city's growth. 3. Improve connectivity and accessibility to green and blue infrastructure within the city and beyond. 4. Improve and promote a wider understanding and awareness of the benefits that green and blue infrastructure provides to residents, the economy, and the local environment.

2.2.1.5 Manchester Climate Change Framework 2020-25

Following the declaration of a climate emergency by MCC In July 2019, this framework was adopted and is an in-depth strategy to accompany the Draft Manchester Zero Carbon Framework 2020-38, which was published in February 2019. It is a framework that will continue to develop over the next five years, in line with changes in policy, climate science, rate of progress and other factors. The framework has set out four objectives to facilitate this:

Objective 1 – Staying within our carbon budgets.

- Direct CO2 emissions: staying within our 15-million-ton carbon budget for 2018-2100, including reducing the CO2 emitted from our homes, workplaces and ground transport by at least 50% during 2020-25.
- Indirect CO2 emissions: understanding and taking action on the things that we consume, and which generate greenhouse gases through their production, transportation and disposal.

Objective 2 – Climate adaptation and resilience

- Increase the amount of urban green infrastructure cover, aiming for a 10% increase by 2038 from 2018 levels, in line with the Greater Manchester aim.
- Respond to these risks by incorporating adaptation and resilience within our plans and strategies, and acting to make necessary changes to our buildings, infrastructure and our natural environment.

Objective 3 – Health and wellbeing

- Adapt the city's built and natural environment and prepare our residents to become more resilient to these changes. Increasing the amount and quality of green space to enable residents to benefit from the improved physical and mental health that will come as a result.
- Improving the energy efficiency of the city's homes and providing access to affordable, secure supplies of renewable energy are essential help get 38,000 Manchester households out of fuel poverty.

Objective 4 – Inclusive, zero carbon and climate resilient economy

- Ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.

2.2.2 Sustainable Design Definitions

As a result of ever changing and improving carbon emission targets, developments are required to take more sustainable approaches to the construction of their buildings which commonly differ from site to site. This results in buildings being explained under many definitions and using various terminology when they incorporate sustainable design to reduce these carbon emissions.

The most common of these terminologies can be summarised as:

- Net Zero Carbon
- Carbon Neutral
- Low Carbon

The below table outlines the formal definitions of each of these terminologies.

Terminology:	Carbon / Energy targets:	Definition:
Net Zero Carbon	Net Zero carbon emissions	Buildings that generate **100%** of their energy needs **on-site** without the need to import energy.
Carbon Neutral	Net Zero carbon emissions	Buildings achieving **net zero** carbon emissions by offsetting through the use of a renewable energy supplier (electricity only) or via a financial contribution.
Low Carbon	Carbon emission % reduction normally over the building regulation standards.	Buildings achieving **reduced** carbon emission through **energy-efficient design**.

Table 2: Overview of Sustainable Design Definitions

2.2.3 Manchester City Council's Planning Document Targets

Manchester City Planning Policy currently uses the following documents to look to establish the carbon reduction targets to be achieved in new developments across the City.

These documents use different terminology to describe achieving the various reduced carbon emissions.

Please see below a summary of the terminology and targets set out within the current Manchester Planning Policy documents:

Planning Document:	Time of Production or Adoption:	Low Carbon Target:	Sustainable Design Definition:
Manchester Council's Core Strategy 2012-2027	Adopted 2012	Targets a **9%** reduction in carbon emissions over Part L Building Regulations.	**Low Carbon** (9% over Part L 2013)
Climate Change and Low Emission Strategies 2016-2020	Adopted 2016	Targets a **48%** reduction in carbon emissions from 1990 - 2020	**Low Carbon** (48% over 1990 emissions)
Manchester: A Certain Future	Produced in 2009, updated in 2013	Targets emitting 41% less CO_2 in 2020 than in 2005 – Equates to **10%** over Part L 2013 (if going by Part L requirements)	**Low Carbon** (10% over Part L 2013)
Draft Manchester Zero Carbon Framework	February 2019	Targets reducing carbon emissions by **50%** over 2018 levels by 2022 and zero carbon by 2038	**Low Carbon** (50% over Part L 2013) by 2022, and Carbon Neutral by 2038

Table 3: Overview of Manchester Planning Documents Carbon Targets

2.2.4 National Planning Policy

The NPPF (February 2019) sets out the Government's planning policies for England and how these are expected to be applied. The overall emphasis of the NPPF is to reiterate the Government's key objectives, including securing sustainable development.

The NPPF defines the purpose of the planning system as being to contribute to the achievement of sustainable development. It explains at Paragraph 8 that there are three dimensions to sustainable development. These are economic, social and environmental and should be pursued simultaneously through the planning system.

Paragraph 10 states that at the heart of the Framework is a presumption in favour of sustainable development.

2.3 Sustainable Design Strategy

2.3.1 Energy and Carbon Emissions

Building Services Strategy

In response to the policy requirements and climate change plan targets set out in section 2.2, developments should aim to assist and achieve the following carbon reduction targets:

1. Achieve a minimum of 10% CO2 reduction over the Part L 2013 Target Emission Rate (TER), as per Target 2 (Electricity intense buildings) in Table 12.1 of Policy EN6.
2. Assist in achieving carbon neutrality by 2038

To achieve the most accurate calculations and estimates, the proposed units have been modelled using *SAP 2012* the governments Standard Assessment Procedure for residential dwellings.

The proposed strategy for minimising energy use and carbon emissions is based on the energy hierarchy described in CIBSE Guide F 2012 (Energy efficiency in buildings). The energy hierarchy has been adopted for the development to ensure that the correct approach to design is taken to promote an energy-efficient low carbon solution (see figure 2). This has ensured that the benefits of effective methods of energy use reduction have been maximised first. The approach adopted is as follows:

Fig 2: Energy Hierarchy

Minimise energy demand – Implement passive design measures and optimise the building envelope in terms of orientation, air tightness, and insulation. For example, the proposal is targeting a low carbon classification through a holistic low energy design concept as it will be designed with a fabric first approach whereby Passive House design standards are aspired to for all fabric U-values and air permeability targets.

Meet demands efficiently – Specification of energy efficient decentralised plant, heating, ventilation, lighting and system controls to facilitate efficient operation. For example, the design has utilised Mechanical Ventilation Heat Recovery (MVHR) systems with high efficiencies to recover heat from all exhaust air.

Particular attention is being paid to the wellbeing of occupants. The ventilation strategy has been developed to minimise noise ingress from the proposed location as far as possible while minimising the risk of overheating.

Additional Renewable Energy Measures

Opportunities for incorporating low and zero carbon technologies (LZCT) have been considered for this development. The viability of several separate technologies was examined in a LZCT study (see section 3) which helped to identify potential opportunities for the inclusion of PV panels

Roof-mounted PV panels, are to provided in this project on suitable roof-top areas of the apartment blocks and contribute significantly to the emissions performance of the development.

In addition, the proposal will have net zero carbon emissions, directly due to obtaining all the energy used on site from a 100% renewable energy electricity supply provider.

Efficient and Sustainable Design Measures

In line with the above Sustainable Design Strategy, the following Energy Efficient design measures are specified.

- Aspiring Passive House design standards
- High levels of insulation throughout with minimal thermal bridges
- Passive solar gains and internal heat sources
- Excellent level of airtightness
- Good indoor air quality by openable windows
- 100% operational energy supplied by a renewable energy provider

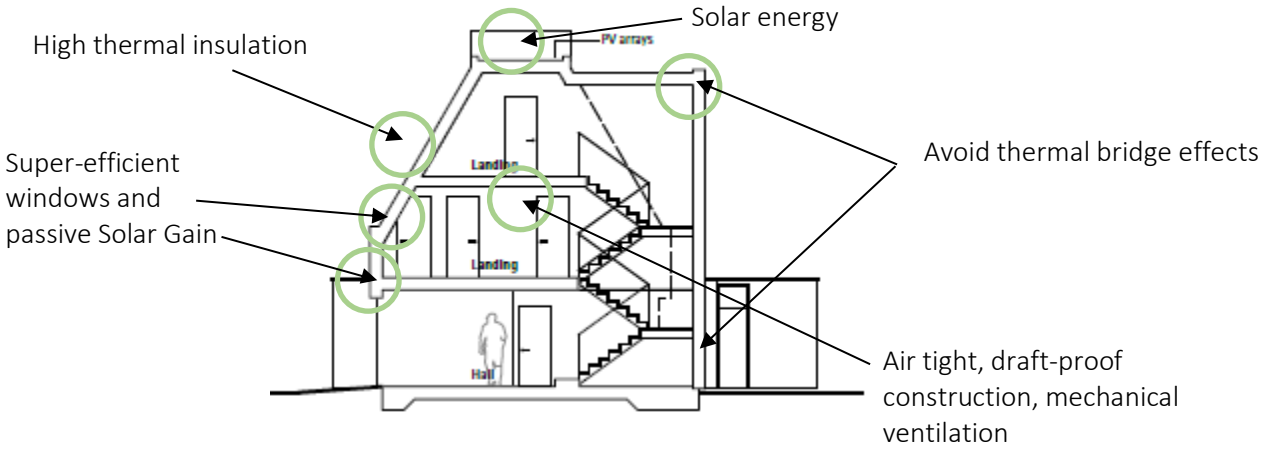


Fig 3. Efficient Design Measure examples

The Proposed specifications and key energy efficient design measures are as follows:

Residential Units:

- Ground/Exposed Floor U-values of 0.10 W/m²K
- External Wall U-values of 0.14 W/m²K
- Roof (all types) U-values of 0.10 W/m²K
- Use of ACD's to minimize Thermal Bridging and y Value with the integration of hi-therm lintels that have a psi value of 0.03
- Low Window U-values of 1.3 W/m^2K
- Low Door U-values of 1.0 W/m^2K
- 100% low energy lighting throughout
- 100% efficient non-fossil fuel Electric Heating
- Electric Hot Water Cylinders (150L/180L/210L)
- Air Permeability Rate of 1m³/hm² in all dwellings
- MVHR Ventilation to each dwelling

2.3.2 Choice and Impact of Renewable Technology

All reasonable technologies were investigated for their suitability to the site and development; please refer to section 3 for details.

In addition to energy efficiency measures, it is proposed that the development will feature the following Low/Zero carbon Technologies:

- 16kWp Site Wide PV Array (Approx. 40no. 400W Panels) implemented onto the roof areas of each apartment block

The above LZC contribution has provided a **1.6%** reduction in CO2 following Energy Efficiency Measures.

- Energy Saving from onsite LZC Technologies = **13783.4 kWh/Yr**
- CO2 Saving from onsite LZC Technologies = **7153.6 kgCO2/Yr**

2.3.3 Energy and CO_2 Reduction Summary

A summary of all stages of the energy demand assessment from baseline figures to final carbon reduction are shown in Figures 1 & 2 below:

Summary of CO_2 Emission Reductions	Total CO_2 emissions ($kgCO_2$/year)		
Carbon Factors	**SAP 9.0**	**SAP 10.0**	**SAP 10.1**
Baseline emissions	536926.7	326683.2	316097
Improved emissions (after application of energy efficiency measures)	433620.1	194669.5	113626.8
Improved emissions (after incorporation of efficient energy supply)	433620.1	113626.8	113626.8
Improved emissions (after incorporation of renewable energy technology) % CO_2 displaced in total	426446.5	191458.0	111752.3
% CO_2 displaced in total	**20.6%**	**41.4%**	**64.6%**
% CO_2 displaced by energy efficiency measures	19.2%	40.4%	64.1%
% CO_2 displaced by efficient supply of energy	0.0%	0.0%	0.0%
% CO_2 displaced by LZC Technologies	**1.6%**	**1.6%**	**1.6%**

Table 4: Summary of CO2 Reductions

	Energy demand (kWh pa)	Energy saving achieved (%)	Regulated CO_2 emissions (kg pa)	Saving achieved on residual CO_2 emissions (%)
Building Regulations Part L compliance ("Baseline" energy dema	1543681.7		536926.7	
Proposed scheme after energy efficiency measures and CHP ("Residual" ener	835491.4	45.9%	433620.1	19.2%
Proposed scheme after on-site renewables	821708.1	46.8%	426466.5	1.6%
Proposed scheme offset for financial contribution or other "allowable solutio			0	0
Total savings on carbon emissions				**20.6%**

Table 5. Total Energy and Carbon Emissions Savings Based on SAP 9.0 Carbon Factors

For a full Breakdown of the figures and calculations please see Appendix A – Energy Demand Assessment Spreadsheet.

Baseline energy demand

'Standard Assessment Procedure - SAP 2012' was used to produce example SAP reports to generate the figures used within the calculations.

Baseline energy demand (kWh pa)	1543681.7
Regulated emissions (kg pa)	536926.7

Heating

The heating and cooling hierarchy has been applied to the design process of the development. It has resulted in large focus on energy efficiency measures and as can be seen in Figure 1.

Energy savings from the use of CHP systems (kWh pa)	-
Emission savings from the use of CHP systems (kg pa)	-
Total regulated emissions after CHP savings (kg pa)	536926.7

Energy efficiency

The following table demonstrates how the development achieves the reduction in carbon dioxide emissions from energy efficiency measures.

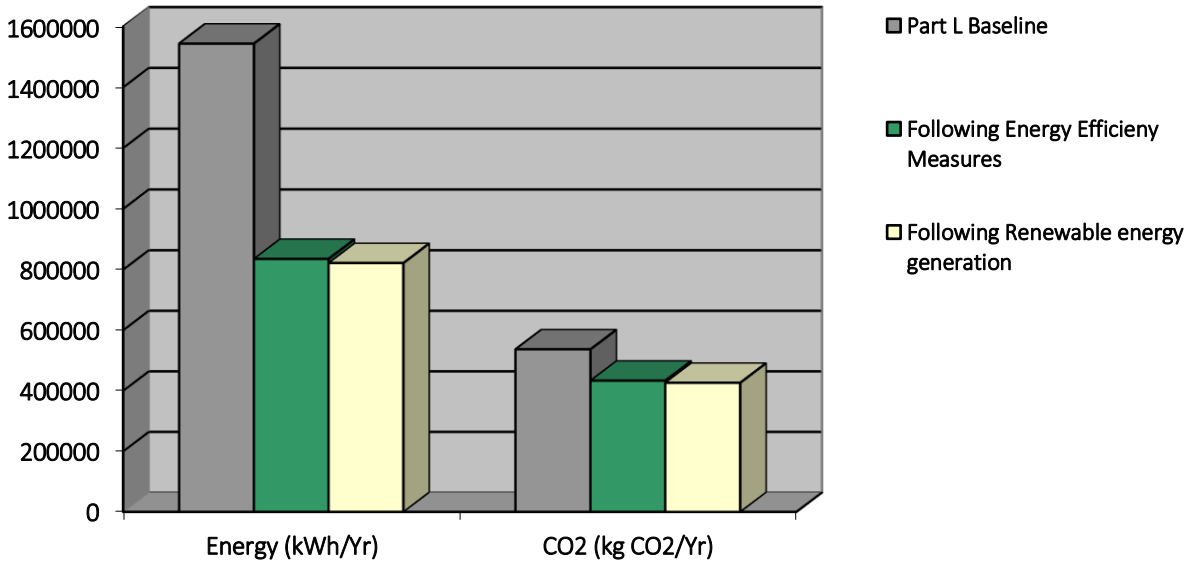
Energy savings from energy efficiency measures (kWh pa)	708190.2
Emission savings from energy efficiency measures (kg pa)	103306.6
Total regulated emissions after CHP savings and energy efficiency measures (kg pa) ("residual emissions")	433620.1

On-site renewables

The following table demonstrates how the development achieves the reduction in carbon dioxide emissions from LZC technologies.

Energy saving from the use of renewables (kWh)	13783.4
Saving on residual emissions from the use of renewables (kg)	7153.6
Saving on residual emissions from the use of renewables (%)	1.6%

The chart below illustrates the improvements over the Part L Compliant Baseline:



2.3.4 Manchester City Council Policy and Targets Summary

With regards to the Manchester City Council's planning documents policy and targets (outlined in section 2.2.1 to 2.2.3) the table below details how the Sustainable Design Strategy (outlined in section 2.3.1) achieves the current planning policy requirements and targets.

Planning Document:	Sustainable Design Strategy
Manchester Council's Core Strategy 2012-2027	The Sustainable Design Strategy achieves a **20.6%** reduction in carbon emissions over Part L 2013 - **exceeding** the EN6 documents Low Carbon target of 9% over Part L 2013.
Climate Change and Low Emission Strategies 2016-2020	The Sustainable Design Strategy achieves a **20.6%** reduction in carbon emissions over Part L 2013 – **exceeding** the documents Low Carbon target of 48% over 1990 Emissions.
Manchester: A Certain Future	The Sustainable Design Strategy achieves a **20.6%** reduction in carbon emissions over Part L 2013 – **exceeding** the documents Low Carbon target of 10% over Part L 2013.
Draft Manchester Zero Carbon Framework	Design Strategy fully adheres with the Carbon Neutral definition through the offsetting of operational emissions by procuring the total electricity supply from a **100%** renewable energy provider.

Table 6. Summary of MCC and Planning Targets

As a result of the sustainable design parameters outlined within section 2.3.1 and the energy and CO2 reduction figures summarised above, the development of 239 residential dwellings at the Collyhurst Village site achieves a total reduction of **20.6%** in carbon emissions over Part L 2013 based on SAP 9.0 carbon factors, however when SAP 10.0 and SAP 10.1 carbon factors are used, this reduction rises to **41.4%** and **64.1%**, respectively. Whilst the development achieves these significant reductions, it is also supplying 100% of the operational energy from a renewable energy supplier. This therefore allows the development to be regarded as both low carbon and carbon neutral, with regards to its carbon emissions.

The low carbon classification for Collyhurst Village can be derived from its prioritisation of fabric first carbon reduction through aspiring to achieve, and in some areas exceeding, Passive House design standards, before the incorporation of on-site renewable technologies.

The site can be defined as **Carbon Neutral** because 100% of the carbon emissions produced on-site will be offset by having all of the energy supplied by a renewable energy electricity provider.

2.4 Adaptation to Climate Change

In addition to the primary building design and fabric, many other issues that will influence creating a Sustainable Development, including flood prevention, material use, waste minimisation and transport. All of these issues feature regularly within the separate climate change action plans, outlined within section 2.2, as areas that Manchester is aiming to significantly improve on in order to become a more carbon neutral and clean city.

All of the sections of creating a sustainable development should be taken into consideration from the start of the development and promoted throughout the building construction on site in order to maximise their benefits. Additionally, features which enable more efficient usage should also be specified to encourage the building users to maintain efficient use once construction has been completed.

2.4.1 Grid Decarbonisation and SAP

Notwithstanding the building's carbon footprint reducing over its useful life, carbon factors in SAP 10.0 and SAP 10.1 are more representative of and show that an all-electric energy source for modern, fabric first high-quality buildings is appropriate at reducing reliance on fossil fuels and moving towards use of the ever-decarbonising electricity grid.

Therefore, to be more representative, robust and provide an up-to-date assessment, the emissions in this report have been calculated using SAP 10.0 and SAP 10.1 standards.

The calculations appropriately demonstrate improvement in CO2 emissions in excess of the Building Regulations Part L 2013 and Core Strategy Policy EN6 targets. Using the SAP 10.0 carbon emissions factor for electricity, the improvement over Part L 2013 is 20.6%. Using the SAP 10.0 and 10.1 factors, this improvement rises to 41.4% and 64.6% respectively.

These improvements are in excess of the Policy EN6 requirements.

Furthermore, the proposed building services strategy will enable the development to track the ongoing carbon reductions being delivered by grid-scale infrastructure. Therefore, the development's carbon footprint will continue to improve over its useful life.

2.4.2 Flood Risk Zone

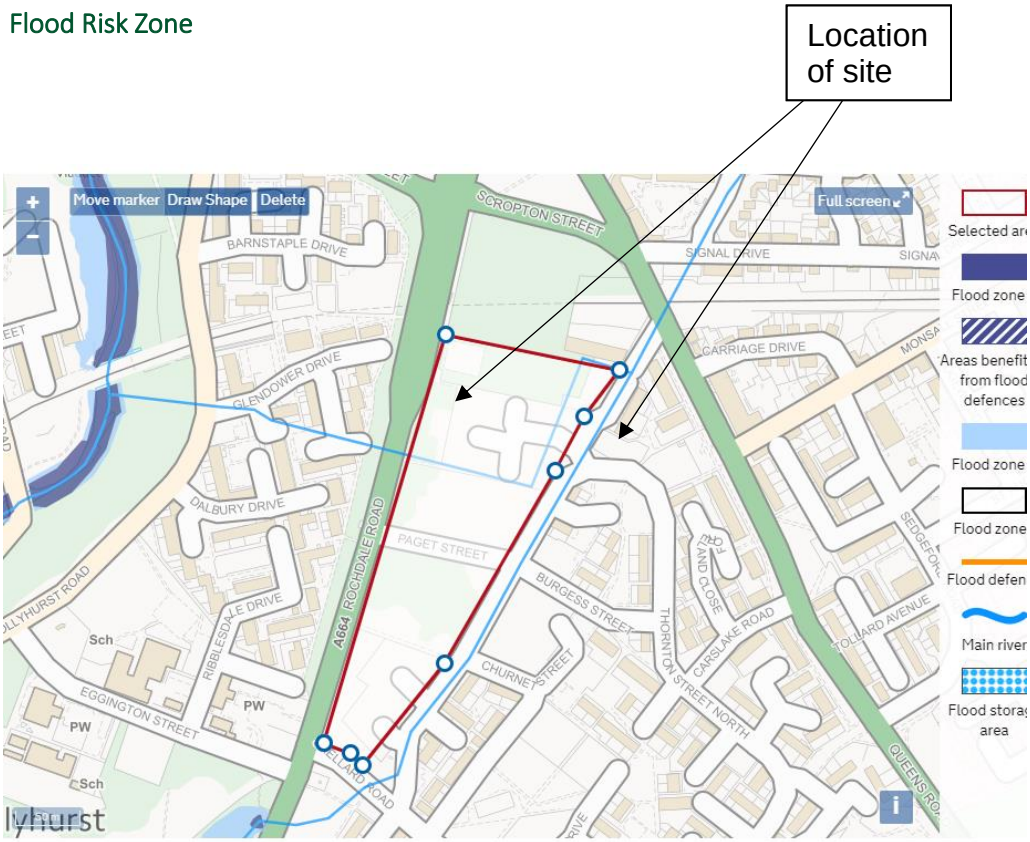


Fig 4: Flood Risk Map

The above map and snippet have been taken from a Government licences flood risk map for central Manchester. It can clearly be seen that the site is located within flood risk zone 1 and therefore has minimal to no risk of flooding.

2.4.3 Green Blue Infrastructure

2.4.3.1 Sustainable Drainage Systems (SUDs)

Even though it has been shown that the proposed scheme is located on a site with a low to zero flood risk, the site is defined as brownfield through planning as it has previously been developed. Therefore, it is proposed to restrict run off to brownfield including a 50% betterment rates for the new development.

As a result the post development surface water discharge rate from the site catchments A and D will be restricted to 1 in 1 year Brownfield rate with a 50% betterment. Whilst catchments B and C will be restricted to greenfield runoff rates. The proposed surface water system has been designed to accommodate the critical 1 in 100 year plus 40% climate change event.

The drainage strategy is proposed to include source control measures including nature based solutions such as raingardens and tree pits. Source control measures will discharge to a below ground piped network which will then discharge to a retention basin within the proposed Park or other site level SuDS

features. Ultimately it is proposed that the surface water will discharge to the culverted watercourse via the UU network beneath Thornton Street North.

See appendix B for a parcelisation plan that shows the locations of these various SUDs features.

By incorporating SuDs, flood risk can be managed and mitigated. Section 1.1 of the SuDs Manual (Ciria C753) states the following:

"Sustainable drainage systems (SuDS) can deliver multiple benefits.

Surface water is a valuable resource, and this should be reflected in the way it is managed and used in the built environment. It can add to and enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate."

The general concept of SUDs is to manage the flood and pollution risks in developed areas. This is done by efficiently managing surface water run-off by either slowing down the surface water run-off, or by reducing the quantity of surface water run-off. There are different methods to achieve this such as:

- Harvesting – capturing rainwater and facilitate its use within the development
- Infiltrating – rainwater infiltrates into the ground
- Storing – capturing rainwater and control the flow through the means of storing and releasing it slowly i.e. attenuation
- Conveying & treating – capturing rainwater and removing any contaminants, then convey the flow towards a downstream system

The SuDS Manual describes the four pillars of SuDS design as Water Quality, Water Quantity, Amenity and Biodiversity as illustrated in Figure 3 below:

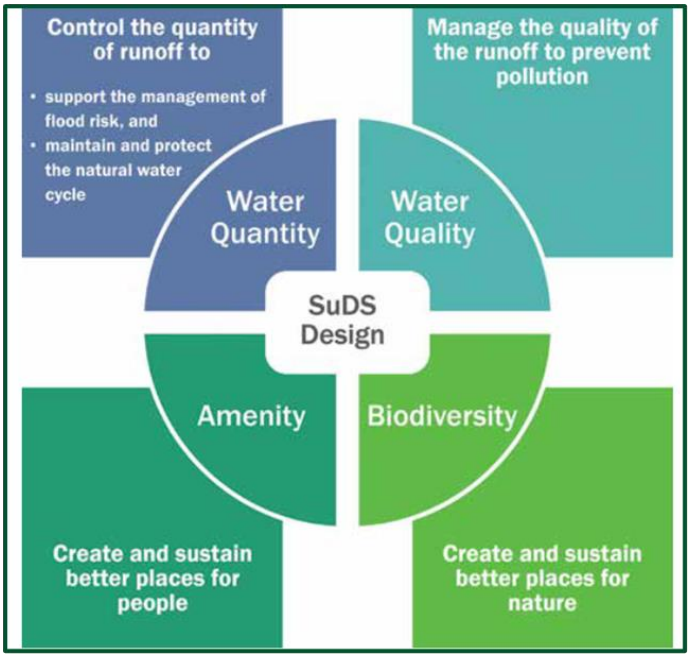


Fig 5. Representation of figure 2.1 of the SUDs Manual

SuDS are increasingly gaining popularity as a holistic solution to a wide range of pressing issues including flood risk, water pollution, groundwater depletion, biodiversity loss and urban decline.

Drainage Hierarchy

To alleviate pressure on existing sewer networks and to address issues of climate change the following hierarchy has been developed and implemented from a planning perspective.

The Planning Practice Guidance, states that:

"generally, the aim should be to discharge surface run-off as high up the following hierarchy of drainage options as reasonable practicably:

1. *Into the ground (infiltration)*
2. *To a surface water body*
3. *To a surface water sewer*
4. *To a combined sewer"*

The "Building Regulations Approved Document H" refer to this discharge hierarchy.

Description	Benefit
Flood risk management	SuDS aim to have an attenuating affect by slowing down and storing surface water run-off
Drainage resilience	Future proofing designed to be resilient against climate change
Natural flow regime protection	Mimic natural drainage arrangements to emulate natural flow
Water quality	Filter out pollutants and discharge cleaner water
Water reuse	Can be strategically placed to clean and capture water for reuse
Biodiversity and ecology	SuDS use vegetation and natural landscape to support biodiversity and ecology
Amenity	Improve visual integrity and desirability of the site by implementing green and blue features
Carbon reduction	SuDS can reduce carbon use throughout the life cycle including construction, maintenance, and demolition
Microclimate	Aim in reducing heat island effects
Education	Educate and engage the general public about surface water management

Table 7. Outline of types of green/blue infrastructure and associated benefit

2.4.3.2 Biodiversity

Similarly, to the previous section on SUDs, the nature of the proposal: including the demolishing of an existing building and potential change in area of impermeable surface, there could be adverse impacts on the surrounding ecology as well potential for the enhancement. Therefore, an ecology report should be produced, by a suitably qualified professional, in order to ensure that any existing ecology on or near the site is adequately protected and to determine the possibility of new habitat creation, planting schemes, green wall areas.

A tree survey was carried out by Amenity Tree Care that determined the main arboriculture interests were the mature trees growing around the site's periphery, in particular the western boundary and the scattered trees within the current site that are contributing to the local landscape. Therefore, it is quoted that every effort should be made to retain these high and medium value trees.

It is also currently proposed that there will be a number of habitat areas incorporated into the design as well as extensive planting. Table 7 below outlines these features:

Type	Amount (area/length/number)
Hedges	128.4m
Ornamental planting type 1	190.4m2 / 0.02ha
Ornamental planting type 2	11525.6m2 / 1.16ha
Sedum roof bin/cycle store	625.6m2 / 0.06ha
Suds	5225.7m2 / 0.52ha
Gardens	3877.2m2 / 0.38ha
Public Lawns	893.1m2.0.08ha
Trees to be planted	174
Flora to be planted	137

Table 8. Collyhurst Village Habitat Areas

2.4.4 Internal Water Efficiency

Part G of the Building Regulations requires all new dwellings to have an internal water consumption of no greater than 110 litres / person / day, unless specified to be less. Therefore, fittings proposed should have low flow rates, capacities, effective flush volumes etc. Example targets for these to achieve the required internal consumption are as follows:

Appliance	Unit of measure	Amount (litres)
WC (Dual flush)	Full flush volume	4
WC (Dual flush)	Part flush volume	2.6
Taps (excluding kitchen)	Flow rate l/min	5
Kitchen taps	Flow rate l/min	6
Bath	Capacity to Overflow	170
Shower	Flow rate l/min	8
Washing Machine	Litres / kg dry load	8.17
Dishwasher	Litres / place setting	1.25

Table 9. Internal Water Efficiency Flow Rates

The above rates will achieve a total internal water consumption of 106.31 with a bath present and 98.25 with only a shower present.

The specifying of 'A' rated appliances should be prioritised where possible.

2.4.5 Waste Management

2.4.5.1 Occupational Waste

Manchester City Council's Waste Storage and Collection Guidance for New Developments 2017 encourages all new developments to incorporate a waste management strategy into the build at the earliest stage possible.

Each individual apartment block has been provided with a bin store at the ground floor level.

All houses will be provided with the required bins to cover all types of waste and recycling that Manchester City Council provide a free pick up service for.

2.4.5.2 Construction Waste

A target of at least 90% of waste generated on site, throughout the construction stage of the development, to be diverted from landfill' will be included as part of a Construction Environmental Management Plan (CEMP) to be agreed with MCC. A CEMP framework is provided at Section 7 of the SPS.

The proposal will also endeavour to maximise the use of recycled materials on site, whereby further promoting the minimising of waste production.

2.4.6 Materials

The construction of new buildings and building elements has a large environmental impact in terms of both, energy and embodied carbon of new materials. Therefore, Manchester Council, through Policy E1.6 of the Unitary Development Plan (UDP) have required all new developments to use environmentally friendly materials, where possible, and encourages the use of recycled building materials. This information should also be incorporated into the SWMP mentioned in the previous subsection (Waste Management) as a means of promoting the re-using and recycling of materials.

Where new materials are to be used, careful consideration of their environmental impact should be taken. This can be achieved by ensuring that only materials that score well under The Green Guide to Specification. This useful online tool can be used as a reference that provides guidance on the relative environmental impacts for a wide range of different building specifications. The BRE's Environmental Profile Methodology determines the Life Cycle Assessment (LCA) of materials, which is what the Guide's specifications are based on.

In order to take full advantage of low impact materials, elements key to the scheme should be specified to achieve ratings of between A+ and C under The Green Guide's ratings. Insulation materials that are specified will also have a global warming potential (GWP) of 5 or less, with an ODP of 0. Additionally, 100% of all timber used as part of the scheme will be responsibly sourced from suppliers that are either Forest Stewardship Council (FSC) accredited, Programme for the Endorsement of Forestry Certification accredited, or a similar recognised accreditation body.

To further promote embodied energy and carbon savings, the scheme will first prioritise the reusing of any demolished materials within the site, however if this is not possible secondary priority must be given to the redirecting from landfill; in line with the waste hierarchy.

Finally, in addition to the above policy points, the development is also recommended to register with the Considerate Constructors Scheme, or a similar approved scheme.

2.4.7 Pollution Control

To reduce emissions of gases with high global warming potential (GWP) and nitrogen oxide (NOx) into the atmosphere, new buildings will be specified with insulating materials that have a GWP of less than 5. This will follow throughout the development to reduce the impact that the construction phase has upon climate change.

Additionally, the following measures will be implemented:

- Pollution Prevention Guidance will be adhered to in respects of air (dust) and water (ground and surface) pollution during the demolition and construction phase.
- External light fittings will be controlled through a time switch, or daylight sensor, to prevent operation during daylight hours to limit the impact of artificial lighting for the development's residents and surrounding environment.
- The development Site is within the locality of the River Irk. Where necessary, temporary drainage and pollution prevention measures should be introduced to Site, this may include, for example, bunded areas and spill kits to prevent harmful chemicals / materials from draining to natural watercourses; and silt traps to ensure that suspended solids are removed from the drainage water.
- Dust suppression measures will also be put in place as part of the Main Contractor's Environmental Management Plan, this will reduce the potential risk to local watercourses (River Irk) and neighbouring properties.

Sound insulation will be specified to achieve Building Regulation Part E compliance standard (this will be verified by pre-completion testing) in addition to meeting the requirements of the council. This will reduce the impact of sound pollution for the occupants within adjoining dwellings.

2.4.8 Health & Wellbeing

A full daylight and sunlight analysis assessment should be carried out for the proposed development to ensure that compliant levels of vertical sky component (VSC), no sky line (NSL) and annual probabal sunlight hours (APSH) are achieved.

In addition to having this assessment completed, the following measures will also be incorporated:

- Efficient MVHR Units are to be specified to each individual dwelling which will provide a continuous source of fresh, filtered air to maintain a healthy indoor environment.
- Enhancing the green infrastructure of the site by introducing extensive planting throughout, therefore improving the physical and mental wellbeing of residents, visitors, and workers.
- The layout of the site will facilitate natural surveillance by creating busy, overlooked within the site and routes to the site. As a result, this will promote a safer and more secure environment.
- The construction of the development will also create external circulation and stoops to courtyards which will help instil a sense of community.

- Secure by Design accreditation will be sought which will incorporate the adoption of crime prevention measures to further prevent crime and promote a safe environment.

The above findings and technology will all help to promote healthy housing for residents which has been identified by the World Health Organisation (WHO) as an increasingly important factor in increasing quality of life, preventing disease and illness, and mitigating climate change.

2.4.9 Sustainable Transport

A key message from all climate change adaptation plans (as mentioned in section 2.2), specifically Our Manchester Strategy 2016-2025, The Zero Carbon Framework (formulated by the Manchester Climate Change Board) and Manchester City Council's Core Strategy 2012-2027, is the need to increase the proportion of cycling, walking and public transport journeys. This is due to it providing both environmental and social benefits through the reducing of emissions, improving air quality and promoting a more active lifestyle.

The proposed development acknowledges the benefits associated with these forms of sustainable transport and is therefore providing cycle stores to each apartment block, with approximately 50% car parking provision, thereby encouraging all residents to commute in a sustainable manner. Furthermore the houses will be provided with driveways and internal space for the storage of bicycles. Additionally, the development will be providing infrastructure cabling to 100% of the houses, for the future fitout of electric vehicle chargers (EVCs). This is on top of providing EVCs to the base build of 50% of the houses and assigning EVCs to 10% of the parking spaces in the base build of the apartments.

Further to providing significant cycle provision and electric car ports, the site is located close to central Manchester and is directly adjacent to Rochdale Road, which has multiple bus stops and flows directly into the centre of Manchester. Rochdale Road ends at Shudehill Tram stop where trams can be taken to both Manchester Victoria and Manchester Piccadilly train station. This proximity to a plethora of transports node with such a range of travel possibilities further reduces the reliance on cars and the negative environmental impacts associated.

Transport Links

Further to providing significant cycle provision, the site is located within central Manchester and therefore has excellent sustainable transport links:

- Train: The closest train station to the site is Manchester Victoria, which is located approximately 1.6 miles southeast of the site, taking roughly 30 minutes to walk to. This station provides access to all other both additional Manchester stations, Manchester Airport, Leeds and other regional and national destinations.
- Bus: The nearest bus stops are located on Chester Road which are roughly 0.1 miles east from the site. These will provide frequent services to Bury, Middleton, Oldham, Shudehill and Rochdale, in addition to links to Piccadilly Gardens, where further buses can be caught to more regional destinations.

- Metrolink: The closest Metrolink station to the site is Manchester Victoria Tram Stop. This provides an additional means of public transport to locations within central Manchester and also further afield to Altrincham, Bury, Eccles, East Didsbury, Rochdale, Ashton-Under-Lyne and Manchester Airport.

Local Amenities

- Collyhurst Park, Village Park and Sand Hills are all situated within a 10-minute walk from the site; providing excellent recreational space for residents, visitors and workers.
- The site is also only 1.6 miles from the centre of Manchester where a multitude of shops and amenities can be accessed.
- Manchester Metropolitan and Manchester University are both less than 3 miles from the proposed development providing good access to higher education. In addition, there are several schools and colleges within a 15-minute walk from the site, including: Saviour Church of England Primary School, Collyhurst Nursery School and Eden Boys' Leadership Academy.
- Due to its proximity to the centre of Manchester, the site has excellent access to music, theatre and art venues, places of religion and Manchester's City Library.

Solar Hot Water (Thermal)

Solar water heating systems are one of the more familiar renewable technologies used at the moment. They use the energy from the sun to heat water, most commonly for hot water needs. Solar heating systems use a heat collector that is usually mounted on a roof in which the sun heats a fluid. This fluid is used to heat water that is stored in either a separate hot water cylinder or in a twin-coil hot water cylinder (the second coil is used to provide additional heating from a boiler or other heat source).

Solar hot water panels could be used however, PV will provide slightly better savings and avoid the need for water storage cylinders when compared.

Renewable Technology Not Chosen.

Photovoltaic Panels (PV)

Photovoltaic modules convert sunlight directly to DC electricity. The solar cells consist of a thin piece of semiconductor material, in most cases of silicon. Through a process called doping, very small amounts of impurities are added to the semiconductor, which creates two different layers called n-type and p-type layers.

Certain wavelengths of light are able to ionize the silicon atoms, which separates some of the positive charges (holes) from the negative charges (electrons). The holes move into the positive or p-layer and the electrons into the negative or n-layer. These opposite charges are attracted to each other, but most of them can only re-combine by the electrons passing through an external circuit, due to an internal potential energy barrier. This flow of electrons produces a DC current.

A PV array can be mounted on the suitable roof space. The amount proposed at this stage is **16.0kWp Site Wide PV Array (Approx. 64no. 250W Panels) implemented onto the main roof areas of each apartment block.**

Chosen Renewable Technology

Ground Source Heat pumps

A heat pump is a device that takes up heat at a certain temperature and releases it at a higher temperature. The essential components of a heat pump are heat exchangers (through which energy is extracted and emitted) and a means of pumping heat between the exchangers. The effectiveness of the heat pump is measured by the ratio of the heating capacity to the effective power input, usually known as the coefficient of performance (COP). Ground-source heat pumps (GSHP) extract heat from the ground. They are classified as either water-to-air or water-to-water units depending on whether the heat distribution system in the building uses air or water. Ground source heat pumps either use long shallow trenches or deep vertical boreholes to take low grade heat from the ground and then compress it to create higher temperatures.

Ground source heat pumps would not be suitable due to the lack of land space around the properties and the associated costs.

Renewable Technology Not Viable

Air Source Heat pumps

Air source heat pumps absorb heat from the outside air. This is usually used to heat radiators, underfloor heating systems, or warm air convectors and hot water in your home. An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside.

The system performs down to air temperatures of -20°c which means that they are more than suitable for installations within the UK. Hot water and Heating can be provided 365 days a year. The hot water is produced without the aid of electrical immersions and at 55°c is more than hot enough for baths and showers.

There are two main types of air source heat pump system:

- An air-to-water system distributes heat via your wet central heating system. Heat pumps work much more efficiently at a lower temperature than a standard boiler system would. So they are more suitable for under-floor heating systems or larger radiators, which give out heat at lower temperatures over longer periods of time.
- An air-to-air system produces warm air which is circulated by fans to heat your home. They are unlikely to provide you with hot water as well.

Air Source heat pumps are a good option to provide heating and cooling however, as previously mentioned the development is already achieving the required reduction through efficient design measures.

Renewable Technology Not Chosen

Biomass Heating

Biomass is any plant-derived organic material that renews itself over a short period.

Biomass energy systems are based on either the direct or indirect combustion of fuels derived from those plant sources. The most common form of biomass is the direct combustion of wood in treated or untreated forms. The use of biomass is becoming increasingly common in some European countries.

The environmental benefits relate to the significantly lower amounts of energy used in biomass production and processing compared to the energy released when they are burnt. This can range from a four-fold return for biodiesel to an approximate 20-fold energy return for woody biomass. Biomass-fuels can be used to produce energy on a continuous basis (unlike renewables such as wind or solar energy) and it can be an economic alternative to fossil fuels as it is a potential source of both heat and electricity.

However, Biomass systems have particular design management and maintenance requirements associated with sourcing, transportation and storage and are therefore more commonly used in commercial developments rather than domestic installations. It can be less convenient to operate than mains-supplied fuels such as natural gas and are more management intensive and require expertise in facilities management. Sources of biomass can also fluctuate, so boilers should be specified to operate on a variety of fuels without risk of overheating or tripping out.

A communal biomass system would not be feasible for this development due to the expense associated with the necessary output to heat all dwellings on the site.

Renewable Technology Not Chosen

Wind

Wind turbines convert the kinetic energy in wind into mechanical energy that is then converted to electricity. Turbines are available in a range of sizes and designs and can either be free-standing, mounted on a building or integrated into a building structure.

The wind speed in the area is under the advised minimum and the built-up area means that a wind turbine wouldn't be feasible.

Renewable Technology Not Viable

4. Conclusion

This statement has assessed the proposed development at the Collyhurst Village site against the relevant climate change and sustainability policies and targets, as outlined within: the Manchester City Council Core Strategy (July 2012), Our Manchester Strategy, Manchester: A Certain Future and The Zero Carbon Framework, through the following of the energy hierarchy, the modelling of apartments in the FSAP 2012 software and addressing all aspects of a sustainable development. In addition, the proposal has been assessed against national sustainable design definitions to determine how it can be classified.

As part of this process, the development was designed with a fabric first approach; with U-values, design air permeability and ventilation targets all aspiring to Passive House design standards and therefore significantly exceeding Building Regulations Part L 2013 standards. Following on from this, efficient MVHR systems were proposed for each apartment and house, in order to further reduce the total energy demands whilst simultaneously providing each dwelling with healthy internal environments. This approach demonstrates a holistic low energy design concept, involving very low limiting values and thus led to high-energy performance targets and being defined as a low carbon development.

Furthermore, an LZC feasibility assessment was carried out, with all suitable technologies investigated for their suitability to the site and development. The assessment determined that a 16kWp system can be proposed at this stage, which would equate to 64No panels and would provide an additional 1.6% reduction in carbon emissions over the residual emissions: bringing the total carbon reduction to 20.6%, when using SAP 9.0 carbon factors. However, this reduction rises further to 41.4% and 64.6% when using SAP 10 and 10.1 carbon factors. In addition to this renewable technology provision, the development can also be defined as carbon neutral because it will have net zero carbon emissions. This is to be achieved by obtaining all the energy used on site from a 100% renewable energy electricity supply provider.

The development will also be adapting to climate change by incorporating sustainable drainage measures; including permeable pavements, swales and raingardens, into the design, protecting existing ecology, enhancing biodiversity where possible, providing cycle storage provision to all apartments and electric car charging ports to every house.

In addition to the following of the energy hierarchy through the efficient design and renewable technology measures mentioned, and meeting all relevant Manchester City Council carbon targets the proposal will include a large number of sustainability measures throughout construction and once completed, which will contribute heavily to the development's sustainability performance and accord with the requirements of the NPPF. The key measures to be included and therefore can be taken from this report include:

- The proposal sits within Flood Risk Zone 1 and therefore has minimal to no risk of flooding.
- A SUDs strategy will be produced to outline all measures to be incorporated that will ensure any additional surface water is collected, treated and removed.
- The development will incorporate green infrastructure in the form of extensive planting involving hedges, trees, sedum/green roofs and ornamental planting that will instil a sense of

wellbeing whilst also assisting with offsetting carbon dioxide and balancing local temperatures through evapotranspiration.

- Internal water efficiency will be prioritised by ensuring that efficient water fixtures are proposed so that each dwelling achieves less than 110L per person per day and 'A' rated appliances will be specified where possible.
- Waste minimisation will be targeted from throughout construction and occupational phase. It is targeted that at least 90% of construction waste will be diverted from landfill. Whilst tri-separator refuse shoots will be installed on each floor to promote recycling.
- In addition to targeting Secure by Design accreditation through adoption crime prevention measures, the site layout promotes busy spaces and routes and facilitates natural surveillance. These will therefore reduce the fear of crime and subsequently improving mental health of residents, visitors and workers.
- Prioritising reusing existing materials and locally sourced materials for construction to reduce waste and transportation to landfill in addition and promote a low embodied carbon development.
- When new materials are specified that are not locally attainable then only those that score well on the BRE: The Green Guide to Specification are to be used; to further encourage the use of sustainable materials and reductions in embodied carbon.
- The buildings will have a daylight and sunlight analysis carried out and will aim to achieve high pass rates. Additionally, highly efficient MVHR systems are being proposed to each flat individually to provide a continuous source of fresh air and maintain healthy indoor environments. These will promote healthy housing and subsequently boost physical and mental wellbeing of residents.
- The proximity of the Manchester City Centre to the proposed site is highly sustainable in terms of transport and local amenities as it is in close proximity to a number of public transport nodes including: Manchester Deansgate Train Station and Cornbrook Metrolink Station, multiple bus stops and additional Metrolink stations, as well as a multitude of shops and other local amenities.
- The development will also include significant cycle storage provision.

As a result of all the above, the proposed sustainable design and energy strategy allows the development to comply with Manchester City Council's planning policy requirement and is in line with all targets put forward in their planning documents.

Apartment Type	Block B-C Maisonette 2B4P Corner x8	Block B-C Maisonette 2B 4P Mid Front x4	Block B-C Maisonette 2B4P Mid Rear x4	Block B-C Apt 2B3P Corner x2	Block B-C Apt 2B3P Corner TopF x2	Block B-C Apt 2B3P Mid x2	Block B-C Apt 2B3P Mid TopF x4	Block B-C Apt 2B4P Corner x4
Frequency	8	4	4	2	2	2	4	4
BASELINE Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	3140.76	2509.21	3701.48	1401.57	1981.07	1197.42	1934.91	2006.2
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	2418.29	2429.88	2434.5	2244.48	2226.39	2307.85	2282.88	2374.32
Electricity Pumps Fans Requirement (DER)	75	75	75	75	75	75	75	75
Electricity Lighting Requirement (DER)	358.9	364.26	371.05	287.22	287.22	313.32	313.32	335.73
TOTAL PER DEVELOPMENT								
AFTER ENERGY SAVING MEASURES Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	1035.23	559.42	1343.46	221.91	573.68	97.5	386.48	413.74
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	1764.41	1764.41	1785.76	1589.33	1589.33	1634.6	1634.6	1709.31
Electricity Pumps Fans Requirement (DER)	252.93	252.93	274.33	130.13	130.13	139.61	139.61	178.14
Electricity Lighting Requirement (DER)	358.9	369.66	374.56	290.93	290.93	319.11	319.11	339.84
TOTAL PER DEVELOPMENT								
FINAL Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	1035.23	559.42	1343.46	221.91	573.68	97.5	386.48	413.74
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	1764.41	1764.41	1785.76	1589.33	1589.33	1634.6	1634.6	1709.31
Electricity Pumps Fans Requirement (DER)	252.93	252.93	274.33	130.13	130.13	139.61	139.61	178.14
Electricity Lighting Requirement (DER)	358.9	369.66	374.56	290.93	290.93	319.11	319.11	339.84
PV Energy Produced (DER)	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4
TOTAL PER DEVELOPMENT								

Block B-C Apt 2B4P Corner Top x4	Block B-C Apt 3B5P Corner x2	Block B-C Apt 3B5P Corner Top x2	Block A2 Maisonette 2B4P Corner x3	Block A2 Maisonette 2B4P Mid x5	Block A1 Apt 2B4P x6	Block A1 Apt 2B4P Top x2	Block A1 Apt 2B3P ExpF(1) x1	Block A1 Apt 2B3P(1) x2	Block A1 Apt 2B3P Top(1) x1
4	2	2	3	5	6	2	1	2	1
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
2720.73	2165.22	3139.33	2929.52	2311.34	1589.82	2434.06	2532.05	1462.12	2110.13
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
2357.03	2493.14	2471.03	2420.8	2434.61	2420.37	2396.17	2258.31	2287.73	2268.2
75	75	75	75	75	75	75	75	75	75
335.73	375.41	375.41	364.26	364.26	359.55	359.55	301.83	301.83	301.83

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
902.43	395.52	1067.86	839.9	437.55	158.03	529	937.84	231.3	594.19
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
1709.31	1813.51	1813.51	1764.41	1764.41	1736.69	1736.69	1625.72	1625.72	1625.72
178.14	201.87	201.87	252.93	252.93	186.71	186.71	137.7	137.7	137.7
339.84	381.8	381.8	369.66	369.66	366.32	366.32	305.87	305.87	305.87

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
902.43	395.52	1067.86	839.9	437.55	158.03	529	937.84	231.3	594.19
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
1709.31	1813.51	1813.51	1764.41	1764.41	1736.69	1736.69	1625.72	1625.72	1625.72
178.14	201.87	201.87	252.93	252.93	186.71	186.71	137.7	137.7	137.7
339.84	381.8	381.8	369.66	369.66	366.32	366.32	305.87	305.87	305.87
-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4

Block A1 Apt 2B3P ExpF(2) x1	Block A1 Apt 2B3P(2) x2	Block A1 Apt 2B3P Top(2) x1	Block A1 Apt 3B5P Corner x4	Block A1 Apt 3B5P Corner Top x2	Block A2 Apt 2B3P x1	Block A2 Apt 2B3P Top x1	Block A2 Apt 3B4P x1	Block A2 Apt 3B4P Top x1	Block A2 Apt 3B5P x2
1	2	1	4	2	1	1	1	1	2
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
1983.51	1471.63	2091.69	2044.32	2921.19	1234.38	1927.72	2227.41	2956.92	2377.85
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
2222.92	2238.47	2220.1	2541.75	2519.89	2303.18	2342.08	2442.63	2426.07	2490.1
75	75	75	75	75	75	75	75	75	75
284.52	284.52	284.52	386.08	386.08	344.12	344.12	345.89	345.89	366.19

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
591.15	264.95	634.89	324.71	792.98	76.25	352.6	583.82	1090.89	578.23
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
1586.06	1586.06	1586.06	1848.25	1848.25	1633.75	1782.21	1772.44	1772.44	1813.68
129.47	129.47	129.47	217.65	217.65	139.43	139.43	186.94	186.94	201.94
287.45	287.45	287.45	388.93	388.93	350.85	350.85	345.89	345.89	366.19

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
591.15	264.95	634.89	324.71	792.98	76.25	352.6	583.82	1090.89	578.23
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
1586.06	1586.06	1586.06	1848.25	1848.25	1633.75	1782.21	1772.44	1772.44	1813.68
129.47	129.47	129.47	217.65	217.65	139.43	139.43	186.94	186.94	201.94
287.45	287.45	287.45	388.93	388.93	350.85	350.85	345.89	345.89	366.19
-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4	-181.4

Block A2 Apt 3B5P Top x2	TOTAL (kWh/yr)		TOTAL (kgCO2/yr)
2	76		
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
3157.7	179159.8	0.216	59982.7
0	0.0	0.519	0.0
0	0.0	0.216	0.0
2473.16	181765.7	0.216	60855.2
75	5700.0	0.519	2958.3
366.19	26325.9	0.519	13663.1
	392951.4		137459.3
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
1116.29	46258.5	0.519	24008.2
0	0.0	0.519	0.0
0	0.0	0.519	0.0
1813.68	131570.4	0.519	68285.0
201.94	15075.5	0.519	7824.2
366.19	26625.3	0.519	13818.5
	219529.7		113935.9
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
1116.29	46258.5	0.519	24008.2
0	0.0	0.519	0.0
0	0.0	0.519	0.0
1813.68	131570.4	0.519	68285.0
201.94	15075.5	0.519	7824.2
366.19	26625.3	0.519	13818.5
-181.4	-13783.4	0.519	-7153.6
	205746.3		106782.3

House Type	HT01 End Tce 2B4P (SW) x2	HT01 End Tce 2B4P (NW) x1	HT01 End Tce 2B4P (SE) x1	HT01 Mid Tce 2B4P (NW) x2	HT01 Mid Tce 2B4P (SE) x2	HT01 End Tce 2B4P (N) x8	HT01 End Tce 2B4P (S) x8	HT01 Mid Tce 2B4P (N) x13
Frequency	2	1	1	2	2	8	8	13
BASELINE Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	3693.96	4292.45	3643.12	3755.12	3151.94	4365.65	3522	3895.66
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	2428.18	2419.72	2428.99	2427.03	2437.36	2418.34	2430.56	2424.18
Electricity Pumps Fans Requirement (DER)	75	75	75	75	75	75	75	75
Electricity Lighting Requirement (DER)	367.04	367.04	367.04	367.04	367.04	367.04	367.04	367.04
TOTAL PER DEVELOPMENT								
AFTER ENERGY SAVING MEASURES Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	1104.59	1671.93	1062.93	1169.96	714.71	1733.31	957.84	1272.84
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25
Electricity Pumps Fans Requirement (DER)	247.93	247.93	247.93	247.93	247.93	247.93	247.93	247.93
Electricity Lighting Requirement (DER)	367.04	367.04	367.04	367.04	367.04	367.04	367.04	367.04
TOTAL PER DEVELOPMENT								
FINAL Dwelling Emission Rate (DER)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
Main Heating Fuel Requirement (DER)	1104.59	1671.93	1062.93	1169.96	714.71	1733.31	957.84	1272.84
Secondary Main Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Secondary Heating Fuel Requirement (DER)	0	0	0	0	0	0	0	0
Water Fuel Requirement (DER)	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25	1780.25
Electricity Pumps Fans Requirement (DER)	247.93	247.93	247.93	247.93	247.93	247.93	247.93	247.93
Electricity Lighting Requirement (DER)	367.04	367.04	367.04	367.04	367.04	367.04	367.04	367.04
PV Energy Produced (DER)								
TOTAL PER DEVELOPMENT								

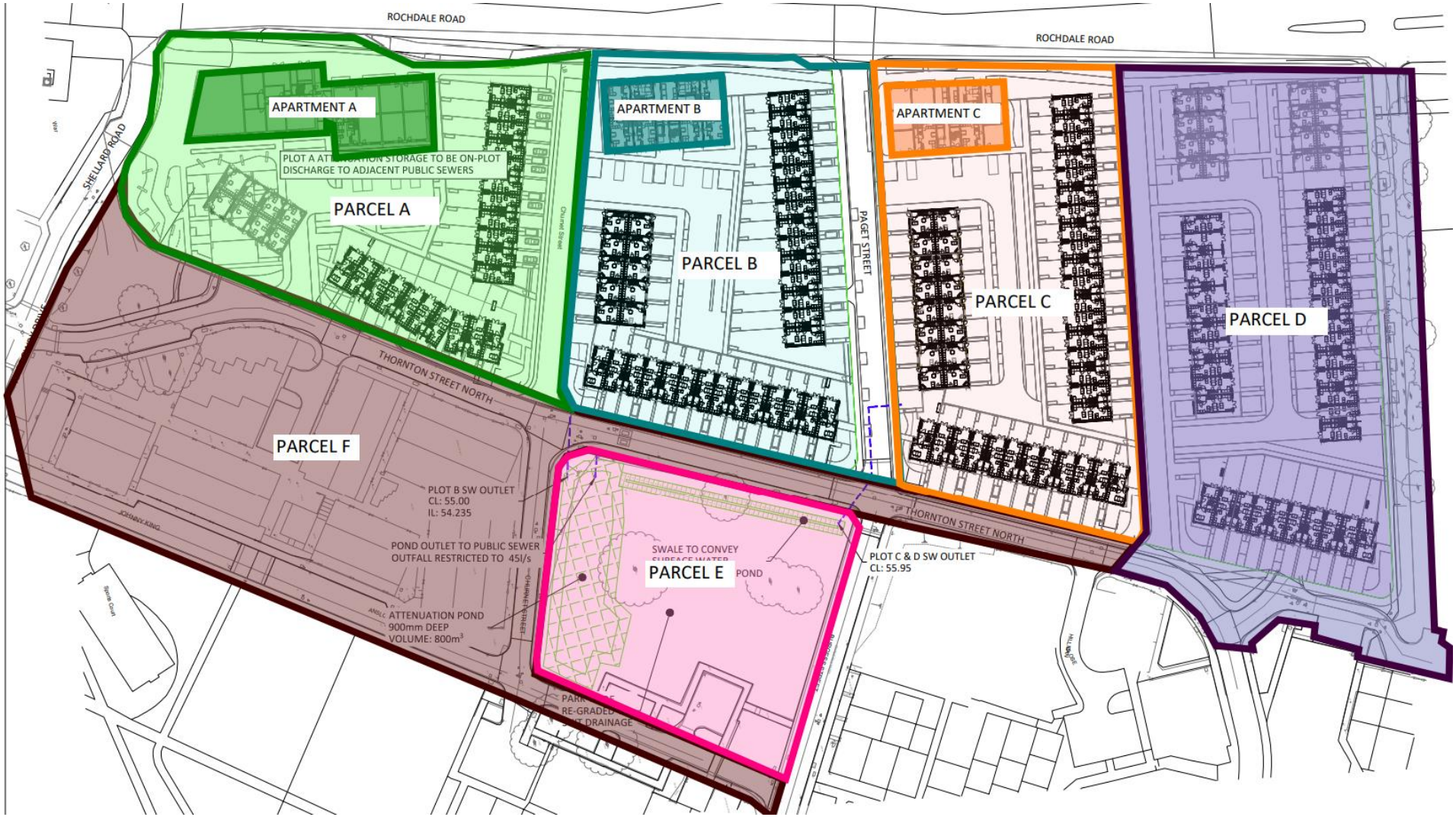
HT01 Mid Tce 2B4P (S) x13	HT02 End Tce 3B5P (N) x8	HT02 End Tce 3B5P (S) x2	HT02 End Tce 3B5P (W) x2	HT02 Mid Tce 3B5P (E-W) x28	HT02 Mid Tce 3B5P (N) x48	HT02 Mid Tce 3B5P (S) x9	HT03 Mid Tce 4B6P (E) Rev x8
13	8	2	2	28	48	9	8
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
2951.32	4857.12	4875.45	5002.39	4145.67	3989.99	4007.86	4702.41
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
2440.71	2527.89	2527.66	2528.32	2539.22	2538.98	2538.69	2615.73
75	75	75	75	75	75	75	75
367.04	406.68	406.68	406.68	406.68	406.68	406.68	442.92

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
580.42	1685.97	1703.71	1886.6	1252.94	1061.67	1075.33	1560.6
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1780.25	1879.12	1879.12	1879.12	1879.12	1879.12	1879.12	2019.62
247.93	304.1	304.1	304.1	304.1	304.1	304.1	353.6
367.04	407.23	407.23	407.23	407.23	407.23	407.23	442.92

Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)
580.42	1685.97	1703.71	1886.6	1252.94	1061.67	1075.33	1560.6
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1780.25	1879.12	1879.12	1879.12	1879.12	1879.12	1879.12	2019.62
247.93	304.1	304.1	304.1	304.1	304.1	304.1	353.6
367.04	407.23	407.23	407.23	407.23	407.23	407.23	442.92

HT04 End Tce 4B6P x4	HT05 End Tce 4B6P x4	TOTAL (kWh/yr)		TOTAL (kgCO2/yr)
4	4	163		
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
5741.16	5029.71	664234.0	0.216	222385.5
0	0	0.0	0.519	0.0
0	0	0.0	0.216	0.0
2604.24	2606.62	409390.4	0.216	137063.9
75	75	12225.0	0.519	6344.8
444.83	439.57	64880.9	0.519	33673.2
		1150730.3		399467.4
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
2457.7	1853.06	200451.6	0.519	104034.4
0	0	0.0	0.519	0.0
0	0	0.0	0.519	0.0
2021.08	2016.93	303596.1	0.519	157566.4
350.18	337.97	46979.7	0.519	24382.5
444.83	439.57	64934.3	0.519	33700.9
		615961.8		319684.2
Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Total Energy Demand (kWh/yr)	Carbon Emission Factor	Associated Total CO2 (kgCO2/yr)
2457.7	1853.06	200451.6	0.519	104034.4
0	0	0.0	0.519	0.0
0	0	0.0	0.519	0.0
2021.08	2016.93	303596.1	0.519	157566.4
350.18	337.97	46979.7	0.519	24382.5
444.83	439.57	64934.3	0.519	33700.9
		0.0	0.519	0.0
		615961.8		319684.2

Appendix B – Parcelisation Plan



Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.8
Printed on 14 October 2020 at 11:08:13

Project Information:

Assessed By: Daniel Watt (STRO026464) **Building Type:** End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 86.83m²

Site Reference : Collyhurst **Plot Reference:** HT01 End Tce 2B4P (SE) x1

Address : Collyhurst, Stoke St Milborough, SY8 2EJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Electricity
Fuel factor: 1.55 (electricity)

Target Carbon Dioxide Emission Rate (TER)	26.06 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	20.67 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.14 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.10 (max. 0.25)	0.10 (max. 0.70)	**OK**
Roof	0.10 (max. 0.20)	0.10 (max. 0.35)	**OK**
Openings	1.30 (max. 2.00)	1.30 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	1.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:	Room heaters - electric Panel, convector or radiant heaters
Secondary heating system:	None

5 Cylinder insulation

Hot water Storage:	Measured cylinder loss: 1.27 kWh/day	
	Permitted by DBSCG: 1.89 kWh/day	**OK**
Primary pipework insulated:	No primary pipework	

Regulations Compliance Report

6 Controls

Space heating controls	Programmer and appliance thermostats	**OK**
Hot water controls:	Cylinderstat	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.71	
Maximum	1.5	**OK**
MVHR efficiency:	86%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (North West England):	Not significant	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South East	17.6m²
Windows facing: South West	5.4m²
Windows facing: North East	3.8m²
Ventilation rate:	8.00
Blinds/curtains:	Dark-coloured curtain or roller blind Closed 100% of daylight hours

10 Key features

Air permeablility	1.0 m³/m²h
Roofs U-value	0.1 W/m²K
Party Walls U-value	0 W/m²K
Floors U-value	0.1 W/m²K

Predicted Energy Assessment

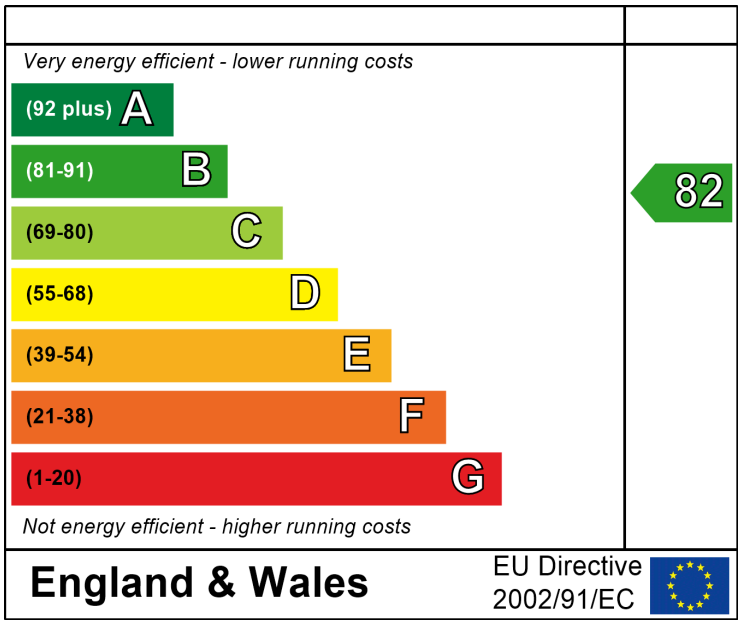
Collyhurst
Stoke St Milborough
SY8 2EJ

Dwelling type: End-terrace House
Date of assessment: 13 October 2020
Produced by: Daniel Watt
Total floor area: 86.83 m²

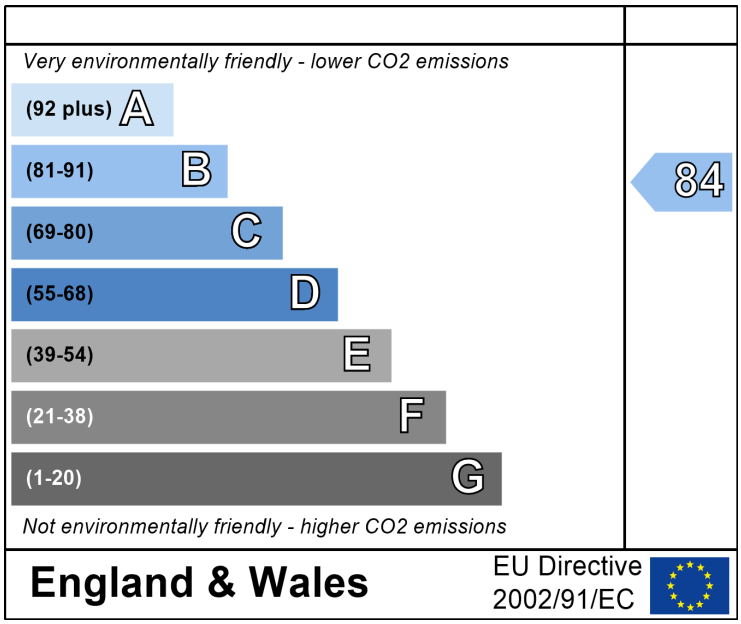
This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO2) emissions.

Energy Efficiency Rating



Environmental Impact (CO_2) Rating



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

SAP Input

Property Details: HT01 End Tce 2B4P (SE) x1

Address:	Collyhurst, Stoke St Milborough, SY8 2EJ
Located in:	England
Region:	North West England
UPRN:	
Date of assessment:	13 October 2020
Date of certificate:	14 October 2020
Assessment type:	New dwelling design stage
Transaction type:	New dwelling
Tenure type:	Unknown
Related party disclosure:	Employed by the professional dealing with the property transaction
Thermal Mass Parameter:	Indicative Value Medium
Water use <= 125 litres/person/day:	True
PCDF Version:	466

Property description:

Dwelling type:	House
Detachment:	End-terrace
Year Completed:	2020

Floor Location:	Floor area:	Storey height:
Floor 0	27.3 m²	2.5 m
Floor 1	27.3 m²	2.7 m
Floor 2	24.38 m²	2.7 m
Floor 3	7.85 m²	2.7 m

Living area:	19.5 m² (fraction 0.225)
Front of dwelling faces:	South East

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
Front	Manufacturer	Windows	low-E, En = 0.05, soft coat	Yes	Metal, thermal break
Right	Manufacturer	Windows	low-E, En = 0.05, soft coat	Yes	Metal, thermal break
Left	Manufacturer	Windows	low-E, En = 0.05, soft coat	Yes	Metal, thermal break

Name:	**Gap:**	**Frame Factor:**	**g-value:**	**U-value:**	**Area:**	**No. of Openings:**
Front	16mm or more	0.73	0.72	1.3	17.6	1
Right	16mm or more	0.73	0.72	1.3	5.4	1
Left	16mm or more	0.73	0.72	1.3	3.8	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
Front		External Walls	South East	0	0
Right		External Walls	South West	0	0
Left		External Walls	North East	0	0

Overshading:	Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
External Elements							
External Walls	107.255	26.8	80.45	0.14	0	False	N/A
Flat Roof	27.3	0	27.3	0.1	0		N/A
Ground floor	27.3			0.1			N/A
Internal Elements							
Party Elements							
Party	96						N/A

Thermal bridges:

SAP Input

Thermal bridges: User-defined (individual PSI-values) Y-Value = 0.0577

	Length	Psi-value		
	13	0.03	E2	Other lintels (including other steel lintels)
[Approved]	8	0.04	E3	Sill
[Approved]	48	0.05	E4	Jamb
[Approved]	10.34	0.16	E5	Ground floor (normal)
[Approved]	30.15	0.07	E6	Intermediate floor within a dwelling
[Approved]	16	0.09	E16	Corner (normal)
[Approved]	2.7	-0.09	E17	Corner (inverted internal area greater than external area)
[Approved]	21.2	0.06	E18	Party wall between dwellings
	17.39	0	E15	Flat roof with parapet
	10.34	0	P1	Ground floor

Ventilation:

Pressure test: Yes (As designed)

Ventilation: Balanced with heat recovery
Number of wet rooms: Kitchen + 3
Ductwork: Insulation, rigid
Approved Installation Scheme: True

Number of chimneys: 0
Number of open flues: 0
Number of fans: 0
Number of passive stacks: 0
Number of sides sheltered: 1
Pressure test: 1

Main heating system:

Main heating system: Room heaters
Electric (direct acting) room heaters
Fuel: Electricity
Info Source: SAP Tables
SAP Table: 691
Panel, convector or radiant heaters

Central heating pump : Unknown
Design flow temperature: Unknown
Unknown
Boiler interlock: Yes
MCS Installation Certificate

Main heating Control:

Main heating Control: Programmer and appliance thermostats
Control code: 2603

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: Electric immersion (on-peak or off-peak)
Water code: 903
Fuel :Electricity
Hot water cylinder
Cylinder volume: 150 litres
Cylinder insulation: Measured loss, 1.27kWh/day
Primary pipework insulation: False
Cylinderstat: True
Cylinder in heated space: True
Immersion: Single
Solar panel: False

Others:

Electricity tariff: Standard Tariff

In Smoke Control Area: Unknown

SAP Input

Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Low rise urban / suburban
EPC language:	English
Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

SAP WorkSheet: New dwelling design stage

User Details:

Assessor Name:	Daniel Watt	**Stroma Number:**	STRO026464
Software Name:	Stroma FSAP 2012	**Software Version:**	Version: 1.0.5.8

Property Address: HT01 End Tce 2B4P (SE) x1

Address : Collyhurst, Stoke St Milborough, SY8 2EJ

1. Overall dwelling dimensions:

	Area(m²)		Av. Height(m)		Volume(m³)	
Ground floor	27.3 (1a)	x	2.5 (2a)	=	68.25	(3a)
First floor	27.3 (1b)	x	2.7 (2b)	=	73.71	(3b)
Second floor	24.38 (1c)	x	2.7 (2c)	=	65.83	(3c)
Third floor	7.85 (1d)	x	2.7 (2d)	=	21.2	(3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	86.83 (4)					
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n)	=	228.98	(5)

2. Ventilation rate:

	main heating		secondary heating		other		total		m³ per hour	
Number of chimneys	0	+	0	+	0	=	0	x 40 =	0	(6a)
Number of open flues	0	+	0	+	0	=	0	x 20 =	0	(6b)
Number of intermittent fans							0	x 10 =	0	(7a)
Number of passive vents							0	x 10 =	0	(7b)
Number of flueless gas fires							0	x 40 =	0	(7c)

			Air changes per hour	
Infiltration due to chimneys, flues and fans =	(6a)+(6b)+(7a)+(7b)+(7c) =	0	÷ (5) =	0 (8)
If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)				
Number of storeys in the dwelling (ns)				0 (9)
Additional infiltration			[(9)-1]x0.1 =	0 (10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction				0 (11)
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35				
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0				0 (12)
If no draught lobby, enter 0.05, else enter 0				0 (13)
Percentage of windows and doors draught stripped				0 (14)
Window infiltration	0.25 - [0.2 x (14) ÷ 100] =			0 (15)
Infiltration rate	(8) + (10) + (11) + (12) + (13) + (15) =			0 (16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area				1 (17)
If based on air permeability value, then	(18) = [(17) ÷ 20]+(8), otherwise (18) = (16)			0.05 (18)
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used				
Number of sides sheltered				1 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =			0.92 (20)
Infiltration rate incorporating shelter factor	(21) = (18) x (20) =			0.05 (21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

SAP WorkSheet: New dwelling design stage

Monthly average wind speed from Table 7

(22)m=	5.1	5	4.9	4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7

Wind Factor (22a)m = (22)m ÷ 4

(22a)m=	1.27	1.25	1.23	1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18

Adjusted infiltration rate (allowing for shelter and wind speed) = (21a) x (22a)m

	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05

Calculate effective air change rate for the applicable case

If mechanical ventilation: 0.5 (23a)

If exhaust air heat pump using Appendix N, (23b) = (23a) × Fmv (equation (N5)) , otherwise (23b) = (23a) 0.5 (23b)

If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) = 73.1 (23c)

a) If balanced mechanical ventilation with heat recovery (MVHR) (24a)m = (22b)m + (23b) × [1 – (23c) ÷ 100]

(24a)m=	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	(24a)

b) If balanced mechanical ventilation without heat recovery (MV) (24b)m = (22b)m + (23b)

(24b)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24b)

c) If whole house extract ventilation or positive input ventilation from outside
if (22b)m < 0.5 × (23b), then (24c) = (23b); otherwise (24c) = (22b) m + 0.5 × (23b)

(24c)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24c)

d) If natural ventilation or whole house positive input ventilation from loft
if (22b)m = 1, then (24d)m = (22b)m otherwise (24d)m = 0.5 + [(22b)m² x 0.5]

(24d)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24d)

Effective air change rate - enter (24a) or (24b) or (24c) or (24d) in box (25)

(25)m=	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	(25)

3. Heat losses and heat loss parameter:

ELEMENT	Gross area (m²)	Openings m²	Net Area A ,m²	U-value W/m2K	A X U (W/K)	k-value kJ/m²·K	A X k kJ/K	
Windows Type 1			17.6	x1/[1/(1.3)+ 0.04] =	21.75			(27)
Windows Type 2			5.4	x1/[1/(1.3)+ 0.04] =	6.67			(27)
Windows Type 3			3.8	x1/[1/(1.3)+ 0.04] =	4.7			(27)
Floor			27.3	x 0.1 =	2.73			(28)
Walls	107.25	26.8	80.45	x 0.14 =	11.26			(29)
Roof	27.3	0	27.3	x 0.1 =	2.73			(30)
Total area of elements, m²			161.85					(31)
Party wall			96	x 0 =	0			(32)

** for windows and roof windows, use effective window U-value calculated using formula 1/[(1/U-value)+0.04] as given in paragraph 3.2*

*** include the areas on both sides of internal walls and partitions*

Fabric heat loss, W/K = S (A x U) (26)…(30) + (32) = 49.84 (33)

Heat capacity Cm = S(A x k) ((28)…(30) + (32) + (32a)…(32e) = 13577.29 (34)

Thermal mass parameter (TMP = Cm ÷ TFA) in kJ/m²K Indicative Value: Medium 250 (35)

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f can be used instead of a detailed calculation.

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Thermal bridges : S (L x Y) calculated using Appendix K — 9.34 (36)

if details of thermal bridging are not known (36) = 0.05 x (31)

Total fabric heat loss (33) + (36) = 59.19 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 × (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m=	14.62	14.53	14.44	14.01	13.92	13.48	13.48	13.4	13.66	13.92	14.09	14.27	(38)

Heat transfer coefficient, W/K (39)m = (37) + (38)m

(39)m=	73.8	73.72	73.63	73.19	73.11	72.67	72.67	72.58	72.84	73.11	73.28	73.46	

Average = Sum(39)$_{1...12}$ /12= 73.17 (39)

Heat loss parameter (HLP), W/m²K (40)m = (39)m ÷ (4)

(40)m=	0.85	0.85	0.85	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.85	

Average = Sum(40)$_{1...12}$ /12= 0.84 (40)

Number of days in month (Table 1a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirement: kWh/year:

Assumed occupancy, N — 2.58 (42)

if TFA > 13.9, N = 1 + 1.76 x [1 - exp(-0.000349 x (TFA -13.9)2)] + 0.0013 x (TFA -13.9)

if TFA £ 13.9, N = 1

Annual average hot water usage in litres per day Vd,average = (25 x N) + 36 — 95.47 (43)

Reduce the annual average hot water usage by 5% if the dwelling is designed to achieve a water use target of not more that 125 litres per person per day (all water use, hot and cold)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(44)m=	105.02	101.2	97.38	93.56	89.74	85.92	85.92	89.74	93.56	97.38	101.2	105.02	

Hot water usage in litres per day for each month Vd,m = factor from Table 1c x (43)

Total = Sum(44)$_{1...12}$ = 1145.64 (44)

Energy content of hot water used - calculated monthly = 4.190 x Vd,m x nm x DTm / 3600 kWh/month (see Tables 1b, 1c, 1d)

(45)m=	155.74	136.21	140.56	122.54	117.58	101.46	94.02	107.89	109.18	127.24	138.89	150.82	

Total = Sum(45)$_{1...12}$ = 1502.12 (45)

If instantaneous water heating at point of use (no hot water storage), enter 0 in boxes (46) to (61)

(46)m=	23.36	20.43	21.08	18.38	17.64	15.22	14.1	16.18	16.38	19.09	20.83	22.62	(46)

Water storage loss:

Storage volume (litres) including any solar or WWHRS storage within same vessel — 150 (47)

If community heating and no tank in dwelling, enter 110 litres in (47)

Otherwise if no stored hot water (this includes instantaneous combi boilers) enter '0' in (47)

Water storage loss:

a) If manufacturer's declared loss factor is known (kWh/day): 1.27 (48)

Temperature factor from Table 2b 0.6 (49)

Energy lost from water storage, kWh/year (48) x (49) = 0.76 (50)

b) If manufacturer's declared cylinder loss factor is not known:

Hot water storage loss factor from Table 2 (kWh/litre/day) 0 (51)

If community heating see section 4.3

Volume factor from Table 2a 0 (52)

Temperature factor from Table 2b 0 (53)

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Energy lost from water storage, kWh/year	(47) x (51) x (52) x (53) =	0	(54)
Enter (50) or (54) in (55)		0.76	(55)

Water storage loss calculated for each month ((56)m = (55) × (41)m

(56)m=	23.62	21.34	23.62	22.86	23.62	22.86	23.62	23.62	22.86	23.62	22.86	23.62	(56)

If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷ (50), else (57)m = (56)m where (H11) is from Appendix H

(57)m=	23.62	21.34	23.62	22.86	23.62	22.86	23.62	23.62	22.86	23.62	22.86	23.62	(57)

Primary circuit loss (annual) from Table 3: 0 (58)

Primary circuit loss calculated for each month (59)m = (58) ÷ 365 × (41)m
(modified by factor from Table H5 if there is solar water heating and a cylinder thermostat)

(59)m=	0	0	0	0	0	0	0	0	0	0	0	0	(59)

Combi loss calculated for each month (61)m = (60) ÷ 365 × (41)m

(61)m=	0	0	0	0	0	0	0	0	0	0	0	0	(61)

Total heat required for water heating calculated for each month (62)m = 0.85 × (45)m + (46)m + (57)m + (59)m + (61)m

(62)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	(62)

Solar DHW input calculated using Appendix G or Appendix H (negative quantity) (enter '0' if no solar contribution to water heating)
(add additional lines if FGHRS and/or WWHRS applies, see Appendix G)

(63)m=	0	0	0	0	0	0	0	0	0	0	0	0	(63)

Output from water heater

(64)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	

Output from water heater (annual)$_{1...12}$: 1780.25 (64)

Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)m + (61)m] + 0.8 x [(46)m + (57)m + (59)m]

(65)m=	70.68	62.36	65.63	59.03	57.99	52.02	50.16	54.77	54.59	61.2	64.47	69.05	(65)

include (57)m in calculation of (65)m only if cylinder is in the dwelling or hot water is from community heating

5. Internal gains (see Table 5 and 5a):

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m=	154.79	154.79	154.79	154.79	154.79	154.79	154.79	154.79	154.79	154.79	154.79	154.79	(66)

Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5

(67)m=	51.96	46.15	37.53	28.41	21.24	17.93	19.37	25.18	33.8	42.92	50.09	53.4	(67)

Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5

(68)m=	347.95	351.56	342.46	323.09	298.64	275.66	260.3	256.69	265.79	285.16	309.61	332.59	(68)

Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5

(69)m=	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06	53.06	(69)

Pumps and fans gains (Table 5a)

(70)m=	0	0	0	0	0	0	0	0	0	0	0	0	(70)

Losses e.g. evaporation (negative values) (Table 5)

(71)m=	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	(71)

Water heating gains (Table 5)

(72)m=	95	92.8	88.22	81.99	77.95	72.26	67.42	73.62	75.82	82.26	89.54	92.8	(72)

Total internal gains = (66)m + (67)m + (68)m + (69)m + (70)m + (71)m + (72)m

(73)m=	599.56	595.15	572.86	538.14	502.48	470.5	451.75	460.15	480.07	515	553.9	583.45	(73)

6. Solar gains:

Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

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Orientation:	Access Factor Table 6d		Area m²		Flux Table 6a		g_ Table 6b		FF Table 6c		Gains (W)	
Northeast 0.9x	0.77	x	3.8	x	11.28	x	0.72	x	0.73	=	15.62	(75)
Northeast 0.9x	0.77	x	3.8	x	22.97	x	0.72	x	0.73	=	31.79	(75)
Northeast 0.9x	0.77	x	3.8	x	41.38	x	0.72	x	0.73	=	57.27	(75)
Northeast 0.9x	0.77	x	3.8	x	67.96	x	0.72	x	0.73	=	94.06	(75)
Northeast 0.9x	0.77	x	3.8	x	91.35	x	0.72	x	0.73	=	126.43	(75)
Northeast 0.9x	0.77	x	3.8	x	97.38	x	0.72	x	0.73	=	134.79	(75)
Northeast 0.9x	0.77	x	3.8	x	91.1	x	0.72	x	0.73	=	126.09	(75)
Northeast 0.9x	0.77	x	3.8	x	72.63	x	0.72	x	0.73	=	100.52	(75)
Northeast 0.9x	0.77	x	3.8	x	50.42	x	0.72	x	0.73	=	69.79	(75)
Northeast 0.9x	0.77	x	3.8	x	28.07	x	0.72	x	0.73	=	38.85	(75)
Northeast 0.9x	0.77	x	3.8	x	14.2	x	0.72	x	0.73	=	19.65	(75)
Northeast 0.9x	0.77	x	3.8	x	9.21	x	0.72	x	0.73	=	12.75	(75)
Southeast 0.9x	0.77	x	17.6	x	36.79	x	0.72	x	0.73	=	235.87	(77)
Southeast 0.9x	0.77	x	17.6	x	62.67	x	0.72	x	0.73	=	401.78	(77)
Southeast 0.9x	0.77	x	17.6	x	85.75	x	0.72	x	0.73	=	549.73	(77)
Southeast 0.9x	0.77	x	17.6	x	106.25	x	0.72	x	0.73	=	681.14	(77)
Southeast 0.9x	0.77	x	17.6	x	119.01	x	0.72	x	0.73	=	762.93	(77)
Southeast 0.9x	0.77	x	17.6	x	118.15	x	0.72	x	0.73	=	757.42	(77)
Southeast 0.9x	0.77	x	17.6	x	113.91	x	0.72	x	0.73	=	730.23	(77)
Southeast 0.9x	0.77	x	17.6	x	104.39	x	0.72	x	0.73	=	669.21	(77)
Southeast 0.9x	0.77	x	17.6	x	92.85	x	0.72	x	0.73	=	595.24	(77)
Southeast 0.9x	0.77	x	17.6	x	69.27	x	0.72	x	0.73	=	444.05	(77)
Southeast 0.9x	0.77	x	17.6	x	44.07	x	0.72	x	0.73	=	282.52	(77)
Southeast 0.9x	0.77	x	17.6	x	31.49	x	0.72	x	0.73	=	201.86	(77)
Southwest 0.9x	0.77	x	5.4	x	36.79		0.72	x	0.73	=	72.37	(79)
Southwest 0.9x	0.77	x	5.4	x	62.67		0.72	x	0.73	=	123.27	(79)
Southwest 0.9x	0.77	x	5.4	x	85.75		0.72	x	0.73	=	168.67	(79)
Southwest 0.9x	0.77	x	5.4	x	106.25		0.72	x	0.73	=	208.99	(79)
Southwest 0.9x	0.77	x	5.4	x	119.01		0.72	x	0.73	=	234.08	(79)
Southwest 0.9x	0.77	x	5.4	x	118.15		0.72	x	0.73	=	232.39	(79)
Southwest 0.9x	0.77	x	5.4	x	113.91		0.72	x	0.73	=	224.05	(79)
Southwest 0.9x	0.77	x	5.4	x	104.39		0.72	x	0.73	=	205.33	(79)
Southwest 0.9x	0.77	x	5.4	x	92.85		0.72	x	0.73	=	182.63	(79)
Southwest 0.9x	0.77	x	5.4	x	69.27		0.72	x	0.73	=	136.24	(79)
Southwest 0.9x	0.77	x	5.4	x	44.07		0.72	x	0.73	=	86.68	(79)
Southwest 0.9x	0.77	x	5.4	x	31.49		0.72	x	0.73	=	61.93	(79)

Solar gains in watts, calculated for each month (83)m = Sum(74)m …(82)m

(83)m=	323.86	556.84	775.67	984.19	1123.45	1124.6	1080.37	975.06	847.66	619.14	388.85	276.54	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts

(84)m=	923.42	1151.99	1348.53	1522.33	1625.93	1595.1	1532.13	1435.21	1327.73	1134.14	942.75	860	(84)

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (°C) | 21 | (85)

Utilisation factor for gains for living area, h1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(86)m=	0.96	0.88	0.75	0.57	0.42	0.29	0.21	0.23	0.38	0.65	0.9	0.97	(86)

Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)

(87)m=	20.6	20.8	20.93	20.99	21	21	21	21	21	20.98	20.8	20.54	(87)

Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)

(88)m=	20.21	20.21	20.21	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.21	(88)

Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)

(89)m=	0.95	0.86	0.72	0.54	0.38	0.26	0.17	0.19	0.34	0.61	0.87	0.96	(89)

Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)

(90)m=	19.71	19.97	20.14	20.2	20.22	20.22	20.22	20.22	20.22	20.2	19.99	19.63	(90)

fLA = Living area ÷ (4) = | 0.22 | (91)

Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2

(92)m=	19.91	20.16	20.32	20.38	20.39	20.4	20.4	20.4	20.39	20.37	20.17	19.83	(92)

Apply adjustment to the mean internal temperature from Table 4e, where appropriate

(93)m=	19.91	20.16	20.32	20.38	20.39	20.4	20.4	20.4	20.39	20.37	20.17	19.83	(93)

8. Space heating requirement

Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Utilisation factor for gains, hm:

(94)m=	0.94	0.86	0.72	0.55	0.39	0.26	0.18	0.2	0.35	0.62	0.87	0.96	(94)

Useful gains, hmGm , W = (94)m x (84)m

(95)m=	868.85	985.29	971.2	832.21	634.54	421.15	275.87	290.1	458.22	700.85	823.16	822.42	(95)

Monthly average external temperature from Table 8

(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2	(96)

Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m– (96)m]

(97)m=	1151.82	1124.87	1017.28	840.25	635.41	421.2	275.87	290.11	458.51	714.38	957.74	1148.25	(97)

Space heating requirement for each month, kWh/month = 0.024 x [(97)m – (95)m] x (41)m

(98)m=	210.54	93.8	34.28	5.79	0.64	0	0	0	0	10.07	96.9	242.42	

Total per year (kWh/year) = Sum(98)$_{1...5,9...12}$ = | 694.43 | (98)

Space heating requirement in kWh/m²/year | 8 | (99)

9a. Energy requirements – Individual heating systems including micro-CHP)

Space heating:

Fraction of space heat from secondary/supplementary system | 0 | (201)

Fraction of space heat from main system(s) (202) = 1 – (201) = | 1 | (202)

Fraction of total heating from main system 1 (204) = (202) × [1 – (203)] = | 1 | (204)

Efficiency of main space heating system 1 | 100 | (206)

Efficiency of secondary/supplementary heating system, % | 0 | (208)

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/year
Space heating requirement (calculated above)													
	210.54	93.8	34.28	5.79	0.64	0	0	0	0	10.07	96.9	242.42	
(211)m = {[(98)m x (204)] } x 100 ÷ (206)													(211)
	210.54	93.8	34.28	5.79	0.64	0	0	0	0	10.07	96.9	242.42	
Total (kWh/year) =Sum(211)$_{1...5,10...12}$=													694.43 (211)
Space heating fuel (secondary), kWh/month													
= {[(98)m x (201)] } x 100 ÷ (208)													
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0	
Total (kWh/year) =Sum(215)$_{1...5,10...12}$=													0 (215)

Water heating

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Output from water heater (calculated above)	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	
Efficiency of water heater													100 (216)
(217)m=	100	100	100	100	100	100	100	100	100	100	100	100	(217)
Fuel for water heating, kWh/month													
(219)m = (64)m x 100 ÷ (217)m													
(219)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	
Total = Sum(219a)$_{1...12}$ =													1780.25 (219)

Annual totals	**kWh/year**	**kWh/year**
Space heating fuel used, main system 1		694.43
Water heating fuel used		1780.25
Electricity for pumps, fans and electric keep-hot		
mechanical ventilation - balanced, extract or positive input from outside	247.93	(230a)
Total electricity for the above, kWh/year	sum of (230a)…(230g) =	247.93 (231)
Electricity for lighting		367.04 (232)

10a. Fuel costs - individual heating systems:

	Fuel kWh/year	**Fuel Price** (Table 12)	**Fuel Cost** £/year
Space heating - main system 1	(211) x	13.19 x 0.01 =	91.6 (240)
Space heating - main system 2	(213) x	0 x 0.01 =	0 (241)
Space heating - secondary	(215) x	13.19 x 0.01 =	0 (242)
Water heating (electric off-peak tariff)			
High-rate fraction (Table 13, or Appendix F for electric CPSU)		1	(243)
Low-rate fraction	1.0 – (243) =	0	(244)
High-rate cost	(219) x (243) x	13.19 x 0.01 =	234.81 (245)
Low-rate cost	(219) x (244) x	13.19 x 0.01 =	0 (246)
Pumps, fans and electric keep-hot	(231)	13.19 x 0.01 =	32.7 (249)
(if off-peak tariff, list each of (230a) to (230g) separately as applicable and apply fuel price according to Table 12a			
Energy for lighting	(232)	13.19 x 0.01 =	48.41 (250)

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Additional standing charges (Table 12)		0	(251)
Appendix Q items: repeat lines (253) and (254) as needed			
Total energy cost	(245)...(247) + (250)...(254) =	407.52	(255)

11a. SAP rating - individual heating systems

Energy cost deflator (Table 12)		0.42	(256)
Energy cost factor (ECF)	[(255) x (256)] ÷ [(4) + 45.0] =	1.3	(257)
SAP rating (Section 12)		81.89	(258)

12a. CO2 emissions – Individual heating systems including micro-CHP

	Energy kWh/year		**Emission factor** kg CO2/kWh		**Emissions** kg CO2/year	
Space heating (main system 1)	(211)	x	0.519	=	360.41	(261)
Space heating (secondary)	(215)	x	0.519	=	0	(263)
Water heating	(219)	x	0.519	=	923.95	(264)
Space and water heating	(261) + (262) + (263) + (264) =				1284.36	(265)
Electricity for pumps, fans and electric keep-hot	(231)	x	0.519	=	128.68	(267)
Electricity for lighting	(232)	x	0.519	=	190.49	(268)
Total CO2, kg/year	sum of (265)…(271) =				1603.53	(272)
CO2 emissions per m²	(272) ÷ (4) =				18.47	(273)
EI rating (section 14)					84	(274)

13a. Primary Energy

	Energy kWh/year		**Primary** factor		**P. Energy** kWh/year	
Space heating (main system 1)	(211)	x	3.07	=	2131.91	(261)
Space heating (secondary)	(215)	x	3.07	=	0	(263)
Energy for water heating	(219)	x	3.07	=	5465.36	(264)
Space and water heating	(261) + (262) + (263) + (264) =				7597.27	(265)
Electricity for pumps, fans and electric keep-hot	(231)	x	3.07	=	761.14	(267)
Electricity for lighting	(232)	x	0	=	1126.8	(268)
'Total Primary Energy	sum of (265)…(271) =				9485.21	(272)
Primary energy kWh/m²/year	(272) ÷ (4) =				109.24	(273)

DER WorkSheet: New dwelling design stage

User Details:

Assessor Name:	Daniel Watt	**Stroma Number:**	STRO026464
Software Name:	Stroma FSAP 2012	**Software Version:**	Version: 1.0.5.8

Property Address: HT01 End Tce 2B4P (SE) x1

Address : Collyhurst, Stoke St Milborough, SY8 2EJ

1. Overall dwelling dimensions:

	Area(m²)		Av. Height(m)		Volume(m³)	
Ground floor	27.3	(1a) x	2.5	(2a) =	68.25	(3a)
First floor	27.3	(1b) x	2.7	(2b) =	73.71	(3b)
Second floor	24.38	(1c) x	2.7	(2c) =	65.83	(3c)
Third floor	7.85	(1d) x	2.7	(2d) =	21.2	(3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	86.83	(4)				
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n) =		228.98	(5)

2. Ventilation rate:

	main heating		secondary heating		other		total		m³ per hour	
Number of chimneys	0	+	0	+	0	=	0	x 40 =	0	(6a)
Number of open flues	0	+	0	+	0	=	0	x 20 =	0	(6b)
Number of intermittent fans							0	x 10 =	0	(7a)
Number of passive vents							0	x 10 =	0	(7b)
Number of flueless gas fires							0	x 40 =	0	(7c)

			Air changes per hour	
Infiltration due to chimneys, flues and fans =	(6a)+(6b)+(7a)+(7b)+(7c) =	0	÷ (5) =	0	(8)

If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)

Number of storeys in the dwelling (ns)		0	(9)
Additional infiltration	[(9)-1]x0.1 =	0	(10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction		0	(11)
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35			
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0		0	(12)
If no draught lobby, enter 0.05, else enter 0		0	(13)
Percentage of windows and doors draught stripped		0	(14)
Window infiltration	0.25 - [0.2 x (14) ÷ 100] =	0	(15)
Infiltration rate	(8) + (10) + (11) + (12) + (13) + (15) =	0	(16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area		1	(17)
If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)		0.05	(18)
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used			
Number of sides sheltered		1	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.92	(20)
Infiltration rate incorporating shelter factor	(21) = (18) x (20) =	0.05	(21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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Monthly average wind speed from Table 7

(22)m=	5.1	5	4.9	4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7

Wind Factor (22a)m = (22)m ÷ 4

(22a)m=	1.27	1.25	1.23	1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18

Adjusted infiltration rate (allowing for shelter and wind speed) = (21a) x (22a)m

	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05

Calculate effective air change rate for the applicable case

If mechanical ventilation: 0.5 (23a)

If exhaust air heat pump using Appendix N, (23b) = (23a) × Fmv (equation (N5)) , otherwise (23b) = (23a) 0.5 (23b)

If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) = 73.1 (23c)

a) If balanced mechanical ventilation with heat recovery (MVHR) (24a)m = (22b)m + (23b) × [1 – (23c) ÷ 100]

(24a)m=	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	(24a)

b) If balanced mechanical ventilation without heat recovery (MV) (24b)m = (22b)m + (23b)

(24b)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24b)

c) If whole house extract ventilation or positive input ventilation from outside
if (22b)m < 0.5 × (23b), then (24c) = (23b); otherwise (24c) = (22b) m + 0.5 × (23b)

(24c)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24c)

d) If natural ventilation or whole house positive input ventilation from loft
if (22b)m = 1, then (24d)m = (22b)m otherwise (24d)m = 0.5 + [(22b)m² x 0.5]

(24d)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24d)

Effective air change rate - enter (24a) or (24b) or (24c) or (24d) in box (25)

(25)m=	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	(25)

3. Heat losses and heat loss parameter:

ELEMENT	Gross area (m²)	Openings m²	Net Area A ,m²	U-value W/m2K	A X U (W/K)	k-value kJ/m²·K	A X k kJ/K	
Windows Type 1			17.6	x1/[1/(1.3)+ 0.04] =	21.75			(27)
Windows Type 2			5.4	x1/[1/(1.3)+ 0.04] =	6.67			(27)
Windows Type 3			3.8	x1/[1/(1.3)+ 0.04] =	4.7			(27)
Floor			27.3	x 0.1 =	2.73			(28)
Walls	107.25	26.8	80.45	x 0.14 =	11.26			(29)
Roof	27.3	0	27.3	x 0.1 =	2.73			(30)
Total area of elements, m²			161.85					(31)
Party wall			96	x 0 =	0			(32)

** for windows and roof windows, use effective window U-value calculated using formula 1/[(1/U-value)+0.04] as given in paragraph 3.2*

*** include the areas on both sides of internal walls and partitions*

Fabric heat loss, W/K = S (A x U) (26)…(30) + (32) = 49.84 (33)

Heat capacity Cm = S(A x k) ((28)…(30) + (32) + (32a)…(32e) = 13577.29 (34)

Thermal mass parameter (TMP = Cm ÷ TFA) in kJ/m²K Indicative Value: Medium 250 (35)

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f can be used instead of a detailed calculation.

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Thermal bridges : S (L x Y) calculated using Appendix K | 9.34 | (36)

if details of thermal bridging are not known (36) = 0.05 x (31)

Total fabric heat loss (33) + (36) = | 59.19 | (37)

Ventilation heat loss calculated monthly (38)m = 0.33 × (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m=	14.62	14.53	14.44	14.01	13.92	13.48	13.48	13.4	13.66	13.92	14.09	14.27	(38)

Heat transfer coefficient, W/K (39)m = (37) + (38)m

(39)m=	73.8	73.72	73.63	73.19	73.11	72.67	72.67	72.58	72.84	73.11	73.28	73.46	

Average = Sum(39)$_{1...12}$ /12= | 73.17 | (39)

Heat loss parameter (HLP), W/m²K (40)m = (39)m ÷ (4)

(40)m=	0.85	0.85	0.85	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.85	

Average = Sum(40)$_{1...12}$ /12= | 0.84 | (40)

Number of days in month (Table 1a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirement: kWh/year:

Assumed occupancy, N | 2.58 | (42)

if TFA > 13.9, N = 1 + 1.76 x [1 - exp(-0.000349 x (TFA -13.9)2)] + 0.0013 x (TFA -13.9)

if TFA £ 13.9, N = 1

Annual average hot water usage in litres per day Vd,average = (25 x N) + 36 | 95.47 | (43)

Reduce the annual average hot water usage by 5% if the dwelling is designed to achieve a water use target of not more that 125 litres per person per day (all water use, hot and cold)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Hot water usage in litres per day for each month Vd,m = factor from Table 1c x (43)

(44)m=	105.02	101.2	97.38	93.56	89.74	85.92	85.92	89.74	93.56	97.38	101.2	105.02	

Total = Sum(44)$_{1...12}$ = | 1145.64 | (44)

Energy content of hot water used - calculated monthly = 4.190 x Vd,m x nm x DTm / 3600 kWh/month (see Tables 1b, 1c, 1d)

(45)m=	155.74	136.21	140.56	122.54	117.58	101.46	94.02	107.89	109.18	127.24	138.89	150.82	

Total = Sum(45)$_{1...12}$ = | 1502.12 | (45)

If instantaneous water heating at point of use (no hot water storage), enter 0 in boxes (46) to (61)

(46)m=	23.36	20.43	21.08	18.38	17.64	15.22	14.1	16.18	16.38	19.09	20.83	22.62	(46)

Water storage loss:

Storage volume (litres) including any solar or WWHRS storage within same vessel | 150 | (47)

If community heating and no tank in dwelling, enter 110 litres in (47)

Otherwise if no stored hot water (this includes instantaneous combi boilers) enter '0' in (47)

Water storage loss:

a) If manufacturer's declared loss factor is known (kWh/day): | 1.27 | (48)

Temperature factor from Table 2b | 0.6 | (49)

Energy lost from water storage, kWh/year (48) x (49) = | 0.76 | (50)

b) If manufacturer's declared cylinder loss factor is not known:

Hot water storage loss factor from Table 2 (kWh/litre/day) | 0 | (51)

If community heating see section 4.3

Volume factor from Table 2a | 0 | (52)

Temperature factor from Table 2b | 0 | (53)

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Energy lost from water storage, kWh/year	(47) x (51) x (52) x (53) =	0	(54)
Enter (50) or (54) in (55)		0.76	(55)

Water storage loss calculated for each month ((56)m = (55) × (41)m

(56)m=	23.62	21.34	23.62	22.86	23.62	22.86	23.62	23.62	22.86	23.62	22.86	23.62	(56)

If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷ (50), else (57)m = (56)m where (H11) is from Appendix H

(57)m=	23.62	21.34	23.62	22.86	23.62	22.86	23.62	23.62	22.86	23.62	22.86	23.62	(57)

Primary circuit loss (annual) from Table 3	0	(58)

Primary circuit loss calculated for each month (59)m = (58) ÷ 365 × (41)m
(modified by factor from Table H5 if there is solar water heating and a cylinder thermostat)

(59)m=	0	0	0	0	0	0	0	0	0	0	0	0	(59)

Combi loss calculated for each month (61)m = (60) ÷ 365 × (41)m

(61)m=	0	0	0	0	0	0	0	0	0	0	0	0	(61)

Total heat required for water heating calculated for each month (62)m = 0.85 × (45)m + (46)m + (57)m + (59)m + (61)m

(62)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	(62)

Solar DHW input calculated using Appendix G or Appendix H (negative quantity) (enter '0' if no solar contribution to water heating)
(add additional lines if FGHRS and/or WWHRS applies, see Appendix G)

(63)m=	0	0	0	0	0	0	0	0	0	0	0	0	(63)

Output from water heater

(64)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	

Output from water heater (annual)$_{1...12}$	1780.25	(64)

Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)m + (61)m] + 0.8 x [(46)m + (57)m + (59)m]

(65)m=	70.68	62.36	65.63	59.03	57.99	52.02	50.16	54.77	54.59	61.2	64.47	69.05	(65)

include (57)m in calculation of (65)m only if cylinder is in the dwelling or hot water is from community heating

5. Internal gains (see Table 5 and 5a):

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m=	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	(66)

Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5

(67)m=	20.78	18.46	15.01	11.37	8.5	7.17	7.75	10.07	13.52	17.17	20.04	21.36	(67)

Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5

(68)m=	233.12	235.54	229.45	216.47	200.09	184.69	174.4	171.98	178.08	191.06	207.44	222.84	(68)

Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5

(69)m=	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	(69)

Pumps and fans gains (Table 5a)

(70)m=	0	0	0	0	0	0	0	0	0	0	0	0	(70)

Losses e.g. evaporation (negative values) (Table 5)

(71)m=	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	(71)

Water heating gains (Table 5)

(72)m=	95	92.8	88.22	81.99	77.95	72.26	67.42	73.62	75.82	82.26	89.54	92.8	(72)

Total internal gains = (66)m + (67)m + (68)m + (69)m + (70)m + (71)m + (72)m

(73)m=	410.6	408.49	394.37	371.52	348.23	325.82	311.27	317.37	329.12	352.19	378.71	398.7	(73)

6. Solar gains:

Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

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Orientation:	Access Factor Table 6d		Area m²		Flux Table 6a		g_ Table 6b		FF Table 6c		Gains (W)	
Northeast 0.9x	0.77	x	3.8	x	11.28	x	0.72	x	0.73	=	15.62	(75)
Northeast 0.9x	0.77	x	3.8	x	22.97	x	0.72	x	0.73	=	31.79	(75)
Northeast 0.9x	0.77	x	3.8	x	41.38	x	0.72	x	0.73	=	57.27	(75)
Northeast 0.9x	0.77	x	3.8	x	67.96	x	0.72	x	0.73	=	94.06	(75)
Northeast 0.9x	0.77	x	3.8	x	91.35	x	0.72	x	0.73	=	126.43	(75)
Northeast 0.9x	0.77	x	3.8	x	97.38	x	0.72	x	0.73	=	134.79	(75)
Northeast 0.9x	0.77	x	3.8	x	91.1	x	0.72	x	0.73	=	126.09	(75)
Northeast 0.9x	0.77	x	3.8	x	72.63	x	0.72	x	0.73	=	100.52	(75)
Northeast 0.9x	0.77	x	3.8	x	50.42	x	0.72	x	0.73	=	69.79	(75)
Northeast 0.9x	0.77	x	3.8	x	28.07	x	0.72	x	0.73	=	38.85	(75)
Northeast 0.9x	0.77	x	3.8	x	14.2	x	0.72	x	0.73	=	19.65	(75)
Northeast 0.9x	0.77	x	3.8	x	9.21	x	0.72	x	0.73	=	12.75	(75)
Southeast 0.9x	0.77	x	17.6	x	36.79	x	0.72	x	0.73	=	235.87	(77)
Southeast 0.9x	0.77	x	17.6	x	62.67	x	0.72	x	0.73	=	401.78	(77)
Southeast 0.9x	0.77	x	17.6	x	85.75	x	0.72	x	0.73	=	549.73	(77)
Southeast 0.9x	0.77	x	17.6	x	106.25	x	0.72	x	0.73	=	681.14	(77)
Southeast 0.9x	0.77	x	17.6	x	119.01	x	0.72	x	0.73	=	762.93	(77)
Southeast 0.9x	0.77	x	17.6	x	118.15	x	0.72	x	0.73	=	757.42	(77)
Southeast 0.9x	0.77	x	17.6	x	113.91	x	0.72	x	0.73	=	730.23	(77)
Southeast 0.9x	0.77	x	17.6	x	104.39	x	0.72	x	0.73	=	669.21	(77)
Southeast 0.9x	0.77	x	17.6	x	92.85	x	0.72	x	0.73	=	595.24	(77)
Southeast 0.9x	0.77	x	17.6	x	69.27	x	0.72	x	0.73	=	444.05	(77)
Southeast 0.9x	0.77	x	17.6	x	44.07	x	0.72	x	0.73	=	282.52	(77)
Southeast 0.9x	0.77	x	17.6	x	31.49	x	0.72	x	0.73	=	201.86	(77)
Southwest 0.9x	0.77	x	5.4	x	36.79		0.72	x	0.73	=	72.37	(79)
Southwest 0.9x	0.77	x	5.4	x	62.67		0.72	x	0.73	=	123.27	(79)
Southwest 0.9x	0.77	x	5.4	x	85.75		0.72	x	0.73	=	168.67	(79)
Southwest 0.9x	0.77	x	5.4	x	106.25		0.72	x	0.73	=	208.99	(79)
Southwest 0.9x	0.77	x	5.4	x	119.01		0.72	x	0.73	=	234.08	(79)
Southwest 0.9x	0.77	x	5.4	x	118.15		0.72	x	0.73	=	232.39	(79)
Southwest 0.9x	0.77	x	5.4	x	113.91		0.72	x	0.73	=	224.05	(79)
Southwest 0.9x	0.77	x	5.4	x	104.39		0.72	x	0.73	=	205.33	(79)
Southwest 0.9x	0.77	x	5.4	x	92.85		0.72	x	0.73	=	182.63	(79)
Southwest 0.9x	0.77	x	5.4	x	69.27		0.72	x	0.73	=	136.24	(79)
Southwest 0.9x	0.77	x	5.4	x	44.07		0.72	x	0.73	=	86.68	(79)
Southwest 0.9x	0.77	x	5.4	x	31.49		0.72	x	0.73	=	61.93	(79)

Solar gains in watts, calculated for each month (83)m = Sum(74)m …(82)m

(83)m=	323.86	556.84	775.67	984.19	1123.45	1124.6	1080.37	975.06	847.66	619.14	388.85	276.54	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts

(84)m=	734.46	965.33	1170.04	1355.71	1471.68	1450.41	1391.64	1292.43	1176.78	971.33	767.57	675.24	(84)

DER WorkSheet: New dwelling design stage

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (°C) | 21 | (85)

Utilisation factor for gains for living area, h1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(86)m=	0.99	0.94	0.82	0.64	0.46	0.32	0.23	0.26	0.43	0.74	0.96	0.99	(86)

Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)

(87)m=	20.42	20.68	20.88	20.98	21	21	21	21	21	20.95	20.67	20.35	(87)

Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)

(88)m=	20.21	20.21	20.21	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.22	20.21	(88)

Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)

(89)m=	0.98	0.92	0.79	0.6	0.42	0.28	0.19	0.21	0.38	0.7	0.94	0.99	(89)

Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)

(90)m=	19.45	19.81	20.08	20.19	20.21	20.22	20.22	20.22	20.22	20.17	19.82	19.36	(90)

fLA = Living area ÷ (4) = | 0.22 | (91)

Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2

(92)m=	19.67	20.01	20.26	20.37	20.39	20.4	20.4	20.4	20.39	20.35	20.01	19.58	(92)

Apply adjustment to the mean internal temperature from Table 4e, where appropriate

(93)m=	19.67	20.01	20.26	20.37	20.39	20.4	20.4	20.4	20.39	20.35	20.01	19.58	(93)

8. Space heating requirement

Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Utilisation factor for gains, hm:

(94)m=	0.98	0.92	0.8	0.61	0.43	0.29	0.2	0.22	0.39	0.7	0.94	0.99	(94)

Useful gains, hmGm , W = (94)m x (84)m

(95)m=	718.1	887.34	931.64	824.85	633.79	421.11	275.87	290.09	457.88	684.55	720.37	665.33	(95)

Monthly average external temperature from Table 8

(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2	(96)

Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m– (96)m]

(97)m=	1134.19	1113.67	1013	839.49	635.33	421.2	275.87	290.1	458.48	712.69	945.98	1129.96	(97)

Space heating requirement for each month, kWh/month = 0.024 x [(97)m – (95)m] x (41)m

(98)m=	309.57	152.09	60.53	10.54	1.15	0	0	0	0	20.93	162.44	345.68	

Total per year (kWh/year) = Sum(98)$_{1...5,9...12}$ = | 1062.93 | (98)

Space heating requirement in kWh/m²/year | 12.24 | (99)

9a. Energy requirements – Individual heating systems including micro-CHP)

Space heating:

Fraction of space heat from secondary/supplementary system | 0 | (201)

Fraction of space heat from main system(s) (202) = 1 – (201) = | 1 | (202)

Fraction of total heating from main system 1 (204) = (202) × [1 – (203)] = | 1 | (204)

Efficiency of main space heating system 1 | 100 | (206)

Efficiency of secondary/supplementary heating system, % | 0 | (208)

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/year
Space heating requirement (calculated above)													
	309.57	152.09	60.53	10.54	1.15	0	0	0	0	20.93	162.44	345.68	
(211)m = {[(98)m x (204)] } x 100 ÷ (206)													(211)
	309.57	152.09	60.53	10.54	1.15	0	0	0	0	20.93	162.44	345.68	
Total (kWh/year) =Sum(211)$_{1...5,10...12}$=													1062.93 (211)
Space heating fuel (secondary), kWh/month = {[(98)m x (201)] } x 100 ÷ (208)													
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0	
Total (kWh/year) =Sum(215)$_{1...5,10...12}$=													0 (215)

Water heating

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Output from water heater (calculated above)	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	
Efficiency of water heater													100 (216)
(217)m=	100	100	100	100	100	100	100	100	100	100	100	100	(217)
Fuel for water heating, kWh/month (219)m = (64)m x 100 ÷ (217)m													
(219)m=	179.36	157.54	164.18	145.4	141.2	124.32	117.64	131.51	132.04	150.86	161.75	174.45	
Total = Sum(219a)$_{1...12}$ =													1780.25 (219)

Annual totals	**kWh/year**	**kWh/year**
Space heating fuel used, main system 1		1062.93
Water heating fuel used		1780.25
Electricity for pumps, fans and electric keep-hot		
mechanical ventilation - balanced, extract or positive input from outside	247.93	(230a)
Total electricity for the above, kWh/year	sum of (230a)…(230g) =	247.93 (231)
Electricity for lighting		367.04 (232)

12a. CO2 emissions – Individual heating systems including micro-CHP

	Energy kWh/year		**Emission factor** kg CO2/kWh		**Emissions** kg CO2/year	
Space heating (main system 1)	(211) x		0.519	=	551.66	(261)
Space heating (secondary)	(215) x		0.519	=	0	(263)
Water heating	(219) x		0.519	=	923.95	(264)
Space and water heating	(261) + (262) + (263) + (264) =				1475.61	(265)
Electricity for pumps, fans and electric keep-hot	(231) x		0.519	=	128.68	(267)
Electricity for lighting	(232) x		0.519	=	190.49	(268)
Total CO2, kg/year	sum of (265)…(271) =				1794.78	(272)
Dwelling CO2 Emission Rate	(272) ÷ (4) =				20.67	(273)
EI rating (section 14)					82	(274)

TER WorkSheet: New dwelling design stage

User Details:

Assessor Name:	Daniel Watt	**Stroma Number:**	STRO026464
Software Name:	Stroma FSAP 2012	**Software Version:**	Version: 1.0.5.8

Property Address: HT01 End Tce 2B4P (SE) x1

Address : Collyhurst, Stoke St Milborough, SY8 2EJ

1. Overall dwelling dimensions:

	Area(m²)		Av. Height(m)		Volume(m³)	
Ground floor	27.3 (1a)	x	2.5 (2a)	=	68.25	(3a)
First floor	27.3 (1b)	x	2.7 (2b)	=	73.71	(3b)
Second floor	24.38 (1c)	x	2.7 (2c)	=	65.83	(3c)
Third floor	7.85 (1d)	x	2.7 (2d)	=	21.2	(3d)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	86.83	(4)				
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n)	=	228.98	(5)

2. Ventilation rate:

	main heating		secondary heating		other		total		m³ per hour	
Number of chimneys	0	+	0	+	0	=	0	x 40 =	0	(6a)
Number of open flues	0	+	0	+	0	=	0	x 20 =	0	(6b)
Number of intermittent fans							3	x 10 =	30	(7a)
Number of passive vents							0	x 10 =	0	(7b)
Number of flueless gas fires							0	x 40 =	0	(7c)

			Air changes per hour	
Infiltration due to chimneys, flues and fans =	(6a)+(6b)+(7a)+(7b)+(7c) =	30	÷ (5) =	0.13 (8)

If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)

Number of storeys in the dwelling (ns)			0 (9)
Additional infiltration		[(9)-1]x0.1 =	0 (10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction			0 (11)
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35			
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0			0 (12)
If no draught lobby, enter 0.05, else enter 0			0 (13)
Percentage of windows and doors draught stripped			0 (14)
Window infiltration	0.25 - [0.2 x (14) ÷ 100] =		0 (15)
Infiltration rate	(8) + (10) + (11) + (12) + (13) + (15) =		0 (16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area			5 (17)
If based on air permeability value, then	(18) = [(17) ÷ 20]+(8), otherwise (18) = (16)		0.38 (18)
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used			
Number of sides sheltered			1 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =		0.92 (20)
Infiltration rate incorporating shelter factor	(21) = (18) x (20) =		0.35 (21)

Infiltration rate modified for monthly wind speed

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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Monthly average wind speed from Table 7

(22)m=	5.1	5	4.9	4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7

Wind Factor (22a)m = (22)m ÷ 4

(22a)m=	1.27	1.25	1.23	1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18

Adjusted infiltration rate (allowing for shelter and wind speed) = (21a) x (22a)m

0.45	0.44	0.43	0.39	0.38	0.33	0.33	0.33	0.35	0.38	0.4	0.41

Calculate effective air change rate for the applicable case

If mechanical ventilation: 0 (23a)

If exhaust air heat pump using Appendix N, (23b) = (23a) × Fmv (equation (N5)) , otherwise (23b) = (23a) 0 (23b)

If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) = 0 (23c)

a) If balanced mechanical ventilation with heat recovery (MVHR) (24a)m = (22b)m + (23b) × [1 – (23c) ÷ 100]

(24a)m=	0	0	0	0	0	0	0	0	0	0	0	0

(24a)

b) If balanced mechanical ventilation without heat recovery (MV) (24b)m = (22b)m + (23b)

(24b)m=	0	0	0	0	0	0	0	0	0	0	0	0

(24b)

c) If whole house extract ventilation or positive input ventilation from outside
if (22b)m < 0.5 × (23b), then (24c) = (23b); otherwise (24c) = (22b) m + 0.5 × (23b)

(24c)m=	0	0	0	0	0	0	0	0	0	0	0	0

(24c)

d) If natural ventilation or whole house positive input ventilation from loft
if (22b)m = 1, then (24d)m = (22b)m otherwise (24d)m = 0.5 + [(22b)m² x 0.5]

(24d)m=	0.6	0.6	0.59	0.58	0.57	0.56	0.56	0.55	0.56	0.57	0.58	0.59

(24d)

Effective air change rate - enter (24a) or (24b) or (24c) or (24d) in box (25)

(25)m=	0.6	0.6	0.59	0.58	0.57	0.56	0.56	0.55	0.56	0.57	0.58	0.59

(25)

3. Heat losses and heat loss parameter:

ELEMENT	Gross area (m²)	Openings m²	Net Area A ,m²	U-value W/m2K	A X U (W/K)	k-value kJ/m²·K	A X k kJ/K	
Windows Type 1			14.26	x1/[1/(1.4)+ 0.04] =	18.91			(27)
Windows Type 2			4.37	x1/[1/(1.4)+ 0.04] =	5.79			(27)
Windows Type 3			3.08	x1/[1/(1.4)+ 0.04] =	4.08			(27)
Floor			27.3	x 0.13 =	3.549			(28)
Walls	107.25	21.71	85.54	x 0.18 =	15.4			(29)
Roof	27.3	0	27.3	x 0.13 =	3.55			(30)
Total area of elements, m²			161.85					(31)
Party wall			96	x 0 =	0			(32)

** for windows and roof windows, use effective window U-value calculated using formula 1/[(1/U-value)+0.04] as given in paragraph 3.2*

*** include the areas on both sides of internal walls and partitions*

Fabric heat loss, W/K = S (A x U) (26)…(30) + (32) = 51.28 (33)

Heat capacity Cm = S(A x k) ((28)…(30) + (32) + (32a)…(32e) = 13623.1 (34)

Thermal mass parameter (TMP = Cm ÷ TFA) in kJ/m²K Indicative Value: Medium 250 (35)

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f can be used instead of a detailed calculation.

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Thermal bridges : S (L x Y) calculated using Appendix K — 18.14 (36)

if details of thermal bridging are not known (36) = 0.05 x (31)

Total fabric heat loss (33) + (36) = 69.42 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 × (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m=	45.41	45.11	44.82	43.46	43.21	42.02	42.02	41.8	42.47	43.21	43.72	44.26	(38)

Heat transfer coefficient, W/K (39)m = (37) + (38)m

(39)m=	114.83	114.53	114.24	112.88	112.62	111.43	111.43	111.21	111.89	112.62	113.14	113.68	

Average = Sum(39)$_{1...12}$ /12= 112.88 (39)

Heat loss parameter (HLP), W/m²K (40)m = (39)m ÷ (4)

(40)m=	1.32	1.32	1.32	1.3	1.3	1.28	1.28	1.28	1.29	1.3	1.3	1.31	

Average = Sum(40)$_{1...12}$ /12= 1.3 (40)

Number of days in month (Table 1a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirement: kWh/year:

Assumed occupancy, N — 2.58 (42)

if TFA > 13.9, N = 1 + 1.76 x [1 - exp(-0.000349 x (TFA -13.9)2)] + 0.0013 x (TFA -13.9)

if TFA £ 13.9, N = 1

Annual average hot water usage in litres per day Vd,average = (25 x N) + 36 — 95.47 (43)

Reduce the annual average hot water usage by 5% if the dwelling is designed to achieve a water use target of not more that 125 litres per person per day (all water use, hot and cold)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Hot water usage in litres per day for each month Vd,m = factor from Table 1c x (43)

(44)m=	105.02	101.2	97.38	93.56	89.74	85.92	85.92	89.74	93.56	97.38	101.2	105.02	

Total = Sum(44)$_{1...12}$ = 1145.64 (44)

Energy content of hot water used - calculated monthly = 4.190 x Vd,m x nm x DTm / 3600 kWh/month (see Tables 1b, 1c, 1d)

(45)m=	155.74	136.21	140.56	122.54	117.58	101.46	94.02	107.89	109.18	127.24	138.89	150.82	

Total = Sum(45)$_{1...12}$ = 1502.12 (45)

If instantaneous water heating at point of use (no hot water storage), enter 0 in boxes (46) to (61)

(46)m=	23.36	20.43	21.08	18.38	17.64	15.22	14.1	16.18	16.38	19.09	20.83	22.62	(46)

Water storage loss:

Storage volume (litres) including any solar or WWHRS storage within same vessel — 150 (47)

If community heating and no tank in dwelling, enter 110 litres in (47)

Otherwise if no stored hot water (this includes instantaneous combi boilers) enter '0' in (47)

Water storage loss:

a) If manufacturer's declared loss factor is known (kWh/day): 1.39 (48)

Temperature factor from Table 2b 0.54 (49)

Energy lost from water storage, kWh/year (48) x (49) = 0.75 (50)

b) If manufacturer's declared cylinder loss factor is not known:

Hot water storage loss factor from Table 2 (kWh/litre/day) 0 (51)

If community heating see section 4.3

Volume factor from Table 2a 0 (52)

Temperature factor from Table 2b 0 (53)

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Energy lost from water storage, kWh/year	(47) x (51) x (52) x (53) =	0	(54)
Enter (50) or (54) in (55)		0.75	(55)

Water storage loss calculated for each month ((56)m = (55) × (41)m

(56)m=	23.33	21.07	23.33	22.58	23.33	22.58	23.33	23.33	22.58	23.33	22.58	23.33	(56)

If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷ (50), else (57)m = (56)m where (H11) is from Appendix H

(57)m=	23.33	21.07	23.33	22.58	23.33	22.58	23.33	23.33	22.58	23.33	22.58	23.33	(57)

Primary circuit loss (annual) from Table 3: 0 (58)

Primary circuit loss calculated for each month (59)m = (58) ÷ 365 × (41)m
(modified by factor from Table H5 if there is solar water heating and a cylinder thermostat)

(59)m=	23.26	21.01	23.26	22.51	23.26	22.51	23.26	23.26	22.51	23.26	22.51	23.26	(59)

Combi loss calculated for each month (61)m = (60) ÷ 365 × (41)m

(61)m=	0	0	0	0	0	0	0	0	0	0	0	0	(61)

Total heat required for water heating calculated for each month (62)m = 0.85 × (45)m + (46)m + (57)m + (59)m + (61)m

(62)m=	202.33	178.29	187.15	167.63	164.17	146.55	140.61	154.48	154.27	173.83	183.98	197.42	(62)

Solar DHW input calculated using Appendix G or Appendix H (negative quantity) (enter '0' if no solar contribution to water heating)
(add additional lines if FGHRS and/or WWHRS applies, see Appendix G)

(63)m=	0	0	0	0	0	0	0	0	0	0	0	0	(63)

Output from water heater

(64)m=	202.33	178.29	187.15	167.63	164.17	146.55	140.61	154.48	154.27	173.83	183.98	197.42	

Output from water heater (annual)$_{1...12}$: 2050.74 (64)

Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)m + (61)m] + 0.8 x [(46)m + (57)m + (59)m]

(65)m=	89.06	78.96	84.01	76.82	76.37	69.81	68.54	73.15	72.38	79.58	82.25	87.42	(65)

include (57)m in calculation of (65)m only if cylinder is in the dwelling or hot water is from community heating

5. Internal gains (see Table 5 and 5a):

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m=	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	128.99	(66)

Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5

(67)m=	20.78	18.46	15.01	11.37	8.5	7.17	7.75	10.07	13.52	17.17	20.04	21.36	(67)

Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5

(68)m=	233.12	235.54	229.45	216.47	200.09	184.69	174.4	171.98	178.08	191.06	207.44	222.84	(68)

Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5

(69)m=	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	(69)

Pumps and fans gains (Table 5a)

(70)m=	3	3	3	3	3	3	3	3	3	3	3	3	(70)

Losses e.g. evaporation (negative values) (Table 5)

(71)m=	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	-103.19	(71)

Water heating gains (Table 5)

(72)m=	119.7	117.5	112.92	106.69	102.65	96.96	92.12	98.32	100.52	106.96	114.24	117.51	(72)

Total internal gains = (66)m + (67)m + (68)m + (69)m + (70)m + (71)m + (72)m

(73)m=	438.31	436.2	422.07	399.22	375.93	353.52	338.97	345.07	356.82	379.89	406.42	426.4	(73)

6. Solar gains:

Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

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Orientation:	Access Factor Table 6d		Area m²		Flux Table 6a		g_ Table 6b		FF Table 6c		Gains (W)	
Northeast 0.9x	0.77	x	3.08	x	11.28	x	0.63	x	0.7	=	10.62	(75)
Northeast 0.9x	0.77	x	3.08	x	22.97	x	0.63	x	0.7	=	21.62	(75)
Northeast 0.9x	0.77	x	3.08	x	41.38	x	0.63	x	0.7	=	38.95	(75)
Northeast 0.9x	0.77	x	3.08	x	67.96	x	0.63	x	0.7	=	63.97	(75)
Northeast 0.9x	0.77	x	3.08	x	91.35	x	0.63	x	0.7	=	85.98	(75)
Northeast 0.9x	0.77	x	3.08	x	97.38	x	0.63	x	0.7	=	91.67	(75)
Northeast 0.9x	0.77	x	3.08	x	91.1	x	0.63	x	0.7	=	85.75	(75)
Northeast 0.9x	0.77	x	3.08	x	72.63	x	0.63	x	0.7	=	68.36	(75)
Northeast 0.9x	0.77	x	3.08	x	50.42	x	0.63	x	0.7	=	47.46	(75)
Northeast 0.9x	0.77	x	3.08	x	28.07	x	0.63	x	0.7	=	26.42	(75)
Northeast 0.9x	0.77	x	3.08	x	14.2	x	0.63	x	0.7	=	13.36	(75)
Northeast 0.9x	0.77	x	3.08	x	9.21	x	0.63	x	0.7	=	8.67	(75)
Southeast 0.9x	0.77	x	14.26	x	36.79	x	0.63	x	0.7	=	160.35	(77)
Southeast 0.9x	0.77	x	14.26	x	62.67	x	0.63	x	0.7	=	273.13	(77)
Southeast 0.9x	0.77	x	14.26	x	85.75	x	0.63	x	0.7	=	373.71	(77)
Southeast 0.9x	0.77	x	14.26	x	106.25	x	0.63	x	0.7	=	463.05	(77)
Southeast 0.9x	0.77	x	14.26	x	119.01	x	0.63	x	0.7	=	518.65	(77)
Southeast 0.9x	0.77	x	14.26	x	118.15	x	0.63	x	0.7	=	514.9	(77)
Southeast 0.9x	0.77	x	14.26	x	113.91	x	0.63	x	0.7	=	496.42	(77)
Southeast 0.9x	0.77	x	14.26	x	104.39	x	0.63	x	0.7	=	454.94	(77)
Southeast 0.9x	0.77	x	14.26	x	92.85	x	0.63	x	0.7	=	404.65	(77)
Southeast 0.9x	0.77	x	14.26	x	69.27	x	0.63	x	0.7	=	301.87	(77)
Southeast 0.9x	0.77	x	14.26	x	44.07	x	0.63	x	0.7	=	192.06	(77)
Southeast 0.9x	0.77	x	14.26	x	31.49	x	0.63	x	0.7	=	137.23	(77)
Southwest 0.9x	0.77	x	4.37	x	36.79		0.63	x	0.7	=	49.14	(79)
Southwest 0.9x	0.77	x	4.37	x	62.67		0.63	x	0.7	=	83.7	(79)
Southwest 0.9x	0.77	x	4.37	x	85.75		0.63	x	0.7	=	114.53	(79)
Southwest 0.9x	0.77	x	4.37	x	106.25		0.63	x	0.7	=	141.9	(79)
Southwest 0.9x	0.77	x	4.37	x	119.01		0.63	x	0.7	=	158.94	(79)
Southwest 0.9x	0.77	x	4.37	x	118.15		0.63	x	0.7	=	157.79	(79)
Southwest 0.9x	0.77	x	4.37	x	113.91		0.63	x	0.7	=	152.13	(79)
Southwest 0.9x	0.77	x	4.37	x	104.39		0.63	x	0.7	=	139.42	(79)
Southwest 0.9x	0.77	x	4.37	x	92.85		0.63	x	0.7	=	124.01	(79)
Southwest 0.9x	0.77	x	4.37	x	69.27		0.63	x	0.7	=	92.51	(79)
Southwest 0.9x	0.77	x	4.37	x	44.07		0.63	x	0.7	=	58.86	(79)
Southwest 0.9x	0.77	x	4.37	x	31.49		0.63	x	0.7	=	42.05	(79)

Solar gains in watts, calculated for each month (83)m = Sum(74)m …(82)m

(83)m=	220.11	378.45	527.19	668.92	763.58	764.36	734.3	662.72	576.12	420.8	264.28	187.95	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts

(84)m=	658.41	814.65	949.26	1068.14	1139.51	1117.88	1073.27	1007.79	932.94	800.69	670.7	614.35	(84)

TER WorkSheet: New dwelling design stage

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (°C) | 21 | (85)

Utilisation factor for gains for living area, h1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(86)m=	0.99	0.99	0.96	0.9	0.78	0.61	0.45	0.5	0.74	0.94	0.99	1	(86)

Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)

(87)m=	19.68	19.91	20.22	20.58	20.84	20.96	20.99	20.99	20.91	20.56	20.04	19.64	(87)

Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)

(88)m=	19.82	19.83	19.83	19.84	19.84	19.85	19.85	19.86	19.85	19.84	19.84	19.83	(88)

Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)

(89)m=	0.99	0.98	0.95	0.87	0.72	0.51	0.34	0.38	0.65	0.91	0.98	0.99	(89)

Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)

(90)m=	18.09	18.43	18.88	19.38	19.7	19.83	19.85	19.85	19.79	19.36	18.63	18.04	(90)

fLA = Living area ÷ (4) = | 0.22 | (91)

Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2

(92)m=	18.45	18.76	19.18	19.65	19.95	20.09	20.11	20.11	20.04	19.63	18.95	18.4	(92)

Apply adjustment to the mean internal temperature from Table 4e, where appropriate

(93)m=	18.45	18.76	19.18	19.65	19.95	20.09	20.11	20.11	20.04	19.63	18.95	18.4	(93)

8. Space heating requirement

Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

Utilisation factor for gains, hm:

(94)m=	0.99	0.98	0.94	0.87	0.73	0.53	0.36	0.41	0.66	0.9	0.98	0.99	(94)

Useful gains, hmGm , W = (94)m x (84)m

(95)m=	651.64	794.56	895.58	927.3	829.96	593.5	388.49	408.29	617.11	723.08	656.07	609.57	(95)

Monthly average external temperature from Table 8

(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2	(96)

Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m– (96)m]

(97)m=	1624.33	1587.38	1448.43	1213.04	929.52	611.27	390.87	412.25	664.44	1016.87	1340.71	1613.9	(97)

Space heating requirement for each month, kWh/month = 0.024 x [(97)m – (95)m] x (41)m

(98)m=	723.68	532.77	411.32	205.73	74.07	0	0	0	0	218.59	492.93	747.22	

Total per year (kWh/year) = Sum(98)$_{1...5,9...12}$ = | 3406.32 | (98)

Space heating requirement in kWh/m²/year | 39.23 | (99)

9a. Energy requirements – Individual heating systems including micro-CHP)

Space heating:

Fraction of space heat from secondary/supplementary system | 0 | (201)

Fraction of space heat from main system(s) (202) = 1 – (201) = | 1 | (202)

Fraction of total heating from main system 1 (204) = (202) × [1 – (203)] = | 1 | (204)

Efficiency of main space heating system 1 | 93.5 | (206)

Efficiency of secondary/supplementary heating system, % | 0 | (208)

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/year
Space heating requirement (calculated above)													
	723.68	532.77	411.32	205.73	74.07	0	0	0	0	218.59	492.93	747.22	
(211)m = {[(98)m x (204)] } x 100 ÷ (206)													(211)
	773.99	569.81	439.92	220.04	79.22	0	0	0	0	233.78	527.2	799.17	
Total (kWh/year) =Sum(211)$_{1...5,10...12}$=													3643.12 (211)
Space heating fuel (secondary), kWh/month = {[(98)m x (201)] } x 100 ÷ (208)													
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0	
Total (kWh/year) =Sum(215)$_{1...5,10...12}$=													0 (215)

Water heating

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Output from water heater (calculated above)	202.33	178.29	187.15	167.63	164.17	146.55	140.61	154.48	154.27	173.83	183.98	197.42	
Efficiency of water heater													79.8 (216)
(217)m=	87.92	87.56	86.86	85.36	82.85	79.8	79.8	79.8	79.8	85.43	87.32	88.03	(217)
Fuel for water heating, kWh/month (219)m = (64)m x 100 ÷ (217)m													
(219)m=	230.12	203.63	215.47	196.38	198.17	183.65	176.21	193.59	193.32	203.49	210.7	224.25	
Total = Sum(219a)$_{1...12}$ =													2428.99 (219)

Annual totals	**kWh/year**	**kWh/year**	
Space heating fuel used, main system 1		3643.12	
Water heating fuel used		2428.99	
Electricity for pumps, fans and electric keep-hot			
central heating pump:	30		(230c)
boiler with a fan-assisted flue	45		(230e)
Total electricity for the above, kWh/year sum of (230a)…(230g) =		75	(231)
Electricity for lighting		367.04	(232)

12a. CO2 emissions – Individual heating systems including micro-CHP

	Energy kWh/year		**Emission factor** kg CO2/kWh		**Emissions** kg CO2/year	
Space heating (main system 1)	(211) x		0.216	=	786.91	(261)
Space heating (secondary)	(215) x		0.519	=	0	(263)
Water heating	(219) x		0.216	=	524.66	(264)
Space and water heating	(261) + (262) + (263) + (264) =				1311.58	(265)
Electricity for pumps, fans and electric keep-hot	(231) x		0.519	=	38.93	(267)
Electricity for lighting	(232) x		0.519	=	190.49	(268)
Total CO2, kg/year	sum of (265)…(271) =				1540.99	(272)

TER = 26.06 (273)