Air Quality Assessment

The Courtyard Building

SWECO

Change list

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1 Introduction

1.1 General

Sweco UK Limited ('Sweco') was appointed by Great Portland Estates (the 'Client') to provide an air quality assessment for the planning application at 1 Alfred Place, London, WC1E 7EB (the 'Site').

The Site currently consists of three separate buildings, which will be redeveloped into one cohesive commercial offering (the 'Proposed Development'). This will provide a high-quality commercial reception with retail use at ground and basement, four floors of flexible office space, and rooftop space consisting of boardroom type offices, terraces, and amenity spaces. No car parking is proposed.

The Site is located within the planning jurisdiction of London Borough of Camden (LBC).

1.2 Proposed Development Location

The approximate central grid location reference for the Site is 529645 (Easting) and 181729 (Northing). The Site is bordered be Tottenham Court Road to the west, Store Street to the south, Alfred Place to the east, and commercial property to the north.

The location of the Site is presented in **Figure 1.**

1.3 Consultation

Prior to undertaking the air quality assessment, the Air Quality Department at LBC was contacted to agree the assessment scope and methodology. Details pertaining to the appropriate use of local air quality monitoring data, air pollutant background data, and relevant air quality guidance within the context of the Site and Proposed Development were sent to Camden Air Quality Department on 18/09/2024. However, at the time of reporting (September 2024), no response had been received.

2 Air Quality Legislation, Policy & Guidance

This section provides context regarding the relevant policy, legislation and guidance that is relevant to the Proposed Development.

2.1 National Legislation and Policy

Under Part (IV) of the Environment Act 1995[1], the UK government and devolved administrations are instructed to publish and regularly review an Air Quality Strategy for the UK. It also requires authorities to regularly review the quality of air within that authority's area with respect to the national Air Quality Objectives (NAQOs). The NAQO's are enacted into UK law by the Air Quality (England) Regulations 2000[2]. The Environment Act instructs local authorities to respond to any identified or predicted exceedances of NAQOs by declaring an Air Quality Management Area (AQMA) and preparing an Air Quality Action Plan outlining specific measure that the local authority will take with the aim of meeting the NAQOs.

The Air Quality Standards Regulations 2010[3] implement Directive 2008/50/EC (ambient air quality and clear air for Europe)[4] into UK Law. These regulations include legally binding limit values for key pollutants such as particular matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2). Limit values comprise a concentration value, an averaging period and a deadline for compliance.

Following the UK's departure from the EU, the Environment Act 2021[5] established the Office for Environmental Protection (OEP) and designates the OEP as responsible for monitoring progress towards meeting environmental targets. Long-term targets specific to air quality were set within the first Environmental Improvement Plant 2023 (EIP). Pursuant to section 10(6) of the Act, these legal targets relate to $PM_{2.5}$ and have been transposed into law via the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[6]:

- Annual Mean Concentration Target – a maximum concentration of 10 µg/m^3 to be met across England by 2040.
- Population Exposure Reduction Target – a 35% reduction in population exposure by 2040 (compared to a base year of 2018).

The Air Quality Strategy (AQS) 2023[7] replaces the AQS 2007 in England and outlines the current objectives, limit values, and targets set out in the Air Quality standards Regulations 2010 and the Environmental Improvement Plan 2023. A summary of the relevant air quality limit values, objectives, and targets is provided in **Table 2.1**

[1] The Environment Act 1995. UK Parliament
[2] The Air Quality (England) Regulations 2000. No. 298.
[3] The Air Quality Standards Regulations 2021. Statutory Instruments 2010. No. 1001.
[4] Directive 2008/50/EC of the European Parliament and of the Council. May 2008. Official Journal of the European Union.
[5] The Environment Act 2021. Office of Environmental Protection.
[6] The Environmental Improvement Plan 2023. Department for Environment, Food and Rural Affairs.
[7] Air Quality Strategy: Framework for local authority delivery. April 2023. Defra.

Table 2.1: Relevant air quality limit values, objectives, and targets as set out in the Air Quality Strategy for the protection of human health

Pollutant	Averaging period	Concentration ($\mu g/m^3$)	To be achieved by
Nitrogen Dioxide (NO_2)	Annual mean	40	31st December 2005
	1-hour mean	200 (not to be exceeded more than 18 times per year)	31st December 2005
Particulate Matter (PM_{10})	Annual mean	40	31st December 2004
	24-hour mean	50 (not to be exceeded more than 35 times a year)	31st December 2004
Particulate Matter ($PM_{2.5}$)	Annual Average	20	1st January 2020
	Annual Mean (Legal Target)	10	1st January 2040
	Annual Mean (Interim Target) *	12	1st January 2028
**** Interim target** for $PM_{2.5}$ is not legally binding.*			

The NAQOs apply to ambient air wherever there is relevant exposure to the public over the associated averaging period(s). London Local Air Quality Management Technical Guidance 2019 (LLAQM TG19)[8], published by Defra, states where the NAQO's should apply as detailed in **Table 2.2**

Table 2.2: Locations where air quality objectives apply

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties.

[8] London Local Air Quality Management (LLAQM). March 2019. Mayor of London.

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
		Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties*	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and: 24 and eight-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes.	

* – Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.

The annual mean objectives do not apply at commercial and retail properties, The short term objectives apply at the façades of these locations.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[9] published 2023 sets out the governments planning policies for England and provides a framework within which local policies and plans can achieve sustainable development. It states

[9] National Planning Policy Framework. December 2023. Ministry of Housing, Communities and Local Government

that NPPF polices should be considered in the preparation of Local Plans; therefor said policies are relevant to planning decisions.

The following paragraphs of the NPPF are relevant to Air Quality:

Paragraph 174(e):

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by 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 improve local environmental conditions such as air and water quality..."*

Paragraph 186:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or nation 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..."*

2.1.2 Dust Nuisance

Section 79 of the Environmental Protection Act (1990)[10] states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Statutory nuisance is defined as:

- 'Any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'.
- 'Any accumulation or deposition which is prejudicial to health or a nuisance'.

Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

In the context of the Proposed Development, the main potential for nuisance of this nature will arise during the construction phase - potential sources being the demolition, earthworks, construction and trackout.

There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist.

2.2 Regional and Local Planning Policy

2.2.1 Cleaning the Air – London Environment Strategy 2018

The London Environment Strategy[11] replaced the Mayor of London's Air Quality Strategy[12] and sets out a series of policies and proposals for implementation of the UK AQS and for the achievement of the air quality objectives within Greater London. With regards to new developments, the following policies are of relevance:

[10] Environmental Protection Act 1990, 1990, The Stationery Office.
[11] The London Environment Strategy. Available at: https://www.london.gov.uk/what-we-do/environment/london-environment-strategy
[12] Mayor of London's Air Quality Strategy. Available at: https://www.london.gov.uk/sites/default/files/Air_Quality_Strategy_v3.pdf

- Policy 4.2.1 '*Reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport*'.
- Policy 4.2.2 '*Reduce emissions from non-road transport sources, including by phasing out fossil fuels*'.
- Policy 4.3.2 '*The Mayor will encourage the take up of ultra-low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines*'.
- Policy 4.3.3 '*Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality*'.
- Policy 4.3.4 '*Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces*'.

2.2.2 London Plan 2021

Adopted in March 2021, the London Plan[13] provides a strategic framework for London's development over the next 20-25 years, emphasising the implementation of the Mayor's Air Quality Strategy to reduce pollutant emissions and public exposure to pollution.

Policy SI1 – *Improving Air Quality* directs that:

- Development plans should enhance air quality and maintain benefits from existing air quality initiatives.
- Proposals must not worsen existing air quality, create new exceedances, or pose health risks.
- Minimum requirements include:
  - Achieving Air Quality Neutral.
  - Using design solutions to minimize pollution exposure.
  - Submitting an Air Quality Assessment for major developments, particularly in Air Quality Focus Areas.
- Large-scale developments must improve local air quality and submit a statement detailing benefits and measures to reduce pollution exposure.
- Construction projects must adhere to the Non-Road Mobile Machinery Low Emission Zone and minimize emissions following best practices.
- On-site emission reductions are prioritized, with off-site measures acceptable only if equivalent benefits can be shown.

Policy SI3 – *Energy Infrastructure* mandates that major developments in Heat Network Priority Areas implement communal low-temperature heating systems, selecting heat sources according to a specified hierarchy to ensure compliance with air quality standards.

2.2.3 London Borough of Camden Local Plan

The Camden Local Plan, adopted in July 2017[14], outlines the Council's commitment to mitigating air quality impacts from development.

[13] The London Plan 2021. Available at: https://www.london.gov.uk/programmes-strategies/planning/london-plan/new-london-plan/london-plan-2021

[14] London Borough of Camden Local Plan, 2017, Available at: https://www.camden.gov.uk/camden-local-plan1

Policy CC4 - *Air Quality* states that:

- The Council will address both the exposure of occupants to air pollution and the development's effects on air quality.
- Air Quality Assessments (AQAs) are required for developments likely to expose residents to high pollution levels. Planning permission will only be granted if mitigating measures are implemented, where applicable.
- Sensitive developments, like housing and schools, in areas of poor air quality must also include design measures to reduce impacts.
- Projects involving demolition or construction must assess dust and emissions risks in an AQA and secure mitigation measures in a Construction Management Plan.

2.2.4 Camden Clean Air Strategy & Clean Air Action Plan

The London Borough of Camden's Clean Air Strategy 2019-2034[15] outlines a commitment to improving air quality and reducing pollution in the borough over the long term. It focuses on key areas such as reducing vehicle emissions, promoting sustainable transport, and enhancing green spaces.

The Clean Air Action Plan 2023-2026[16] outlines specific actions to support the strategy, including initiatives to implement low emission zones, improve public transport, and engage the community in air quality monitoring. Both documents aim to protect public health and create a cleaner, healthier environment for residents and visitors.

2.3 Relevant Air Quality Assessment Guidance

A summary of the publications referred to in the undertaking of this assessment is provided below.

2.3.1 Camden Planning Guidance on Air Quality

Camden Planning Guidance (CPG) on Air Quality[17] was published in January 2021 to support policies in the Camden Local Plan 2017.

The CPG states *'an Air Quality Assessment is required where any of the following apply:*

- *major applications where occupants will be exposed to poor air quality (along a busy road, diesel railway lines or in a generally congested area);*
- *development that has the potential to significantly change road traffic on a busy road;*
- *the development has more than 75 new residences;*
- *commercial developments with a floorspace of 2,500 sqm or more;*

[15] Camden Clean Air Strategy, 2022, London Borough of Camden
[16] Camden Clean Air Action Plan, 2022, London Borough of Camden
[17] Camden Planning Guidance on Air Quality, 2021. Available at: https://www.camden.gov.uk/documents/20142/4823269/Air+Quality+CPG+Jan+2021.pdf/4d9138c0-6ed0-c1be-ce68-a9ebf61e8477?t=1611580574285

- *developments that include biomass boilers or CHP (combined heat and power) and connections to existing decentralised energy networks (whereby the increased capacity is not already covered by an existing AQA);*
- *substantial earthworks or demolition; and*
- *development that introduces sensitive uses into an area of poor air quality.'*

2.3.2 Mayor of London's Supplementary Planning Guidance for the Control of Dust and Emissions during Construction and Demolition

The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (CDECD SPG)[18], published by the London Councils in 2014, establishes best practices for mitigating air quality impacts during construction and demolition. It addresses emissions from Non-Road Mobile Machinery (NRMM) through a Low Emission Zone introduced in 2015. The SPG outlines a methodology for assessing air quality impacts, requiring a draft air quality assessment with planning applications, later formalized as an Air Quality and Dust Management Plan. It also details site air quality monitoring protocols based on site size and risk. Additionally, the GLA has released a practice note referencing the IAQM's guidance on dust assessment[19] highlighting key aspects of the SPG.

2.3.3 London Plan Guidance - Air Quality Neutral

The London Plan 2021 outlines the air quality requirements that new developments must meet; part of these requirements states all developments must be at least air quality neutral.

Air quality neutral is a term for developments that do not contribute to air pollution beyond allowable benchmarks. These benchmarks are set out in the 'London Plan Guidance – Air Quality Neutral (February 2023)[20] document.

2.3.4 Land-Use Planning and Development Control: Planning for Air Quality

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[21] that offers comprehensive advice on when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and the possible mitigation measures that may be implemented to minimise these impacts.

[18] London Plan, Control of Dust and Emissions. Available at https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance-and-spgs/control-dust-and

[19] The Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction, January 2024.

[20] Greater London Authority, 2023. Available from: Air Quality Neutral (AQN) guidance | London City Hall.

[21] EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality. January 2017. Available at: https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

3 Method of Assessment

3.1 Baseline Air Quality Review

The 2023 Air Quality Annual Status Report[22] (ASR) was published by LBC was reviewed to establish baseline air quality conditions at and surrounding the Site. The ASR provides the annual mean NO_2 monitored levels at the respective monitoring sites for the previous five years (2019-2023).

Background air pollutant concentrations corresponding to the 1 km^2 grid square(s) covering the Site, associated link roads and identified sensitive receptor locations were obtained from Defra's published national pollutant mapping data[23] for use in the air quality assessment. Background concentrations for years 2023 and 2027 were obtained to represent current and future baseline air quality conditions within assessed study area.

The outcome of this review will inform the Site Suitability Assessment and confirm whether the location of the Proposed Development is suitable for its future occupants.

3.2 Construction Phase Assessment

3.2.1 Construction Dust Risk Assessment

Construction phase activities associated with the Proposed Development may result in the generation of fugitive dust emissions which, if transported beyond the Site boundary, can have an adverse impact on local air quality.

The assessment of likely impacts on local air quality due to the generation and dispersion of dust and PM_{10} during construction has been undertaken with reference to the qualitative risk-based appraisal methodology published by the IAQM, the available construction information for the Proposed Development and professional judgement.

The key potential construction air quality emission sources associated with the Proposed Development are:

- **Demolition** – Any activity involved with the removal of an existing structure.
- **Earthworks** – Including processes such as soil-stripping, ground-levelling, excavation and landscaping.
- **Construction** – Any activity involved with the provision of a new structure(s) (e.g. building, road etc.), its modification or refurbishment. This includes associated dust emissions from material stockpiling and material transfer within the Site (i.e. wind erosion);
- **Trackout** – The transport of dust and dirt from the Site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when Heavy Duty Vehicles

[22] Air Quality Annual Status Report, 2024, Available at: https://www.camden.gov.uk/documents/d/guest/camden-2023-air-quality-annual-status-report-final-v2

[23] Defra, 2023, Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

leave the Site with dusty materials, which may then spill onto the road, and / or when HDVs transfer dust and dirt onto the road after travelling on site.

The assessment considers the nature and scale of the activities undertaken for each source and the sensitivity of the local area to an increase in dust, PM_{10}, and $PM_{2.5}$ levels, which enables an appropriate level of risk to be assigned. Risks are described in terms of there being a low, medium or high risk of dust impacts.

Following the assignment of risk, site specific mitigation proportionate to the level of risk is identified for the Proposed Development, and the significance of residual effects is determined. Details of the iterative construction dust risk assessment, following the IAQM guidance[19], have been included in **Appendix A**.

3.2.2 Sensitive Receptors

The IAQM guidance focusses on the following sensitive locations:

- 'human receptors' within 250m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s); and/or,
- 'ecological receptors' within 50m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s).

It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

3.2.3 Exhaust Emissions from Construction Vehicles and Plant

Exhaust emissions from construction vehicles and plant associated with the construction phase would be most likely to impact local air quality at sensitive receptors adjacent to the Site access and roads utilised by construction vehicles.

In the absence of detailed construction phase traffic movements due to the size of the Site and nature of Proposed Development and the duration of the construction phase, the volume of construction traffic movements is likely to be less than the IAQM assessment criteria of an increase of 25 AADT Therefore no further assessment of these emissions is required.

The number and type of NRMM and plant to be used within the Site is unknown but will represent a temporary and spatially varying emissions source throughout the construction period. As all operation of NRMM will be required to meet the Non-Road Mobile Machinery (NRMM) Practical Guide v.6[24] no further assessment of these emissions is required.

[24] https://www.london.gov.uk/sites/default/files/2024-05/NRMM-Practical-Guide-Accessible-May2024.pdf

3.3 Operational Phase Assessment

3.3.1 Vehicle Emissions: Traffic Data and Screening

Potential local air quality impacts associated with the operation of the Proposed Development will predominantly relate to changes in vehicle flows, and thus pollutant emissions, on the local road network particularly where there are sensitive receptors located (e.g. residential properties).

The Proposed Development, which is expected to be operational from 2027 at the earliest, will exclude any car parking and will be a car free development. However, there is potential for the Proposed Development to generate additional movements on the local road network via taxi trips and building servicing vehicles.

A traffic screening exercise was completed with reference to the IAQM/EPUK planning guidance[21] and specifically using the respective traffic screening criteria to determine the need, or otherwise, for a quantitative air quality assessment. The traffic screening criteria applicable to new developments within an AQMA are provided below, with an air quality assessment deemed to be required where there is expected to be:

- A change of light duty vehicle (LDV) flows of more than 100 annual average daily traffic (AADT); and/or
- A change of heavy duty vehicle (HDV) flows of more than 25 AADT.

Traffic data were supplied by the project's transport consultant (Caneparo Associates) for the operational Proposed Development for direct comparison with the equivalent traffic generated by the existing development at the site. This facilitated the above screening exercise. Full details of the screening criteria are provided in **Appendix A.**

A qualitative assessment of the potential local air quality impacts was completed based on the likely change in vehicle movements associated with the operation of the Proposed Development, and the associated exhaust emissions of oxides of nitrogen (NO_x), NO_2, PM_{10}, and $PM_{2.5}$, within the context of baseline air quality and the above screening criteria.

3.3.2 Building Plant Emissions

The Proposed Development will benefit from a 100% electric heating, ventilation and air conditioning (HVAC) system. This will replace the existing gas-fired central heating.

The Proposed Development's back up power supply will use separate protected electrical circuits/local battery back-up and therefore the building will not have local emissions.

On the above basis, no further assessment of building plant emissions has been undertaken.

3.3.3 Assessment of Site Suitability

The Proposed Development will introduce new sensitive receptors (human health) to the Site. As such, the suitability of the Site for the proposed end use needs to be assessed with respect to current and future levels of air quality.

To facilitate this assessment and understand the expected potential exposure of future users of the Proposed Development to air pollution, the outcomes of the baseline air quality review were used in conjunction with a review of local existing sources of air pollutants, based on the Site location.

3.4 Air Quality Neutral Assessment

The London Plan 2021 outlines the air quality requirements that new developments must meet; part of these requirements states all developments must be at least air quality neutral.

Air quality neutral is a term for developments that do not contribute to air pollution beyond allowable benchmarks. These benchmarks are set out in the 'London Plan Guidance – Air Quality Neutral (February 2023) document.

There are two sets of benchmarks which need to be calculated as part of the assessment:

- Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings.
- Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development.

The Proposed Development must meet both benchmarks separately to be air quality neutral. Should one or both benchmarks not be met then appropriate mitigation or offsetting is required.

Therefore, the potential emissions from the Proposed Development have been assessed against these benchmarks in order to determine if air quality neutrality will be achieved.

3.5 Assessment Significance Criteria

3.5.1 Construction Phase Assessment

The IAQM assessment methodology[21] recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity once appropriate mitigation measures are established. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

For the qualitative assessment of local air quality impacts relating to exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site, the significance of effects has been determined within the context of existing flows on the local road network, existing land uses, with professional judgement applied to reach a conclusion.

3.5.2 Operation Phase Assessment

The EPUK/IAQM planning guidance[23] recommends the use of impact descriptors to describe the predicted quantitative air quality impacts relating to additional emissions from traffic generated by the Proposed Development.

Given that a qualitative approach was applied for the operational phase assessment, the EPUK/IAQM guidance on impact descriptors is not applicable and professional judgement has been applied to determine overall significance of the Proposed Development operation on local air quality. Furthermore, this guidance is referenced to assist in assessing the suitability of the Site for the proposed end uses.

4 Baseline Assessment

4.1 Local Air Quality Management

The Proposed Development is located within the London Borough of Camden (LBC). LBC has declared the whole borough as an Air Quality Management Area (AQMA). The AQMA is declared for exceedances of the health-based objectives for nitrogen dioxide (NO_2) and particulate matter (PM_{10}). The Air Quality Focus Area (AQFA) nearest the Site is 'AQFA 176' situated on Oxford Street, approximately 300m south of the development Site.

4.2 Air Quality Monitoring Data

LBC undertakes monitoring of NO_2, PM_{10} and $PM_{2.5}$ using both automatic monitoring and passive diffusion tubes (NO_2) at several locations across the Council area, details of which are presented in the following sections and in **Figure 2.** The most recent data have been obtained from LBC's Air Quality Annual Status Report for 2023.

Whilst the data capture at monitoring sites was largely unaffected by the Covid-19 pandemic, it is considered that the data measured during 2020 and 2021 are not representative of a normal year given the impact of lockdown measures. Therefore, data from 2023 are the most representative at the time of reporting.

4.2.1 Automatic Monitoring

There are two automatic monitoring sites within 1km of the Proposed Development. The nearest automatic monitoring site is BL0 at Russel Square Gardens in Bloomsbury, located 0.6km to the northeast of the Proposed Development. Details of the two automatic sites are presented in **Table 4.1**.

Table 4.1: London Borough of Camden Automatic Monitoring Results 2019-2023

Site ID	Site Type	Distance from Site (km)	Pollutant	Annual mean (µg/m^3) 2019	2020	2021	2022	2023
BL0 (Russel Square Gardens)	Urban Background	0.6	NO_2	32	28	27	26	24
			PM_{10}	18	16	16	17	13
			$PM_{2.5}$	11	9	9	9	8
CD9 (Euston Road)	Roadside	0.9	NO_2	**70**	**43**	**48**	**45**	**46**
			PM_{10}	22	18	19	21	18
			$PM_{2.5}$	14	11	11	12	9

Note: Exceedance of the annual mean NAQO of 40µg/m^3 for NO_2 are highlighted in **bold.**

The Proposed Development, in addition to the majority of surrounding properties, are assigned for commercial use. As such, the 1-hour mean objective for NO_2 is most applicable given the relative short-term exposure of users of the Site.

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Automatic monitoring site CD9 is situated at a roadside location on Euston Road, which experiences higher levels of traffic relative to Tottenham Court Road where the Site is located. As such, levels of air pollution recorded at BI0 are more representative of conditions at the Site relative to CD9.

1 hour mean NO_2 concentrations at BL0 and CD9 have not exceeded the 1 hour mean objective during the period 2019 to 2023.

Similarly, for PM_{10}, the 24-hour mean objective is applicable for commercial receptors. There were no exceedances of either the 24-hour mean objective or the annual mean objective for PM_{10} between 2019-2023 at both monitoring sites. The automatic monitoring results, compared with the 24-Hour Mean Objective is presented in **Table 4.2**.

Table 4.2: PM_{10} Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM_{10} 24-Hour Means > 50 µg/m³

Site ID	Site Type	Distance from Site (km)	Number of PM_{10} 24-Hour Means > 50 µg/m³				
			2019	2020	2021	2022	2023
BL0	Urban Background	0.6	9	4	0	5	0
CD9	Roadside	0.9	8	2	2	6	4
Note: There are 35 exceedances of 24-hour mean >50 µg/m³ permitted before the objective is exceeded.							

Annual mean concentrations of $PM_{2.5}$ in 2023 were below the current statutory standard (20 µg/m³) and below the annual mean target concentration (10 µg/m³) to be achieved by 2040.

4.2.2 Diffusion Tube Monitoring

In 2023 LBC undertook diffusion tube monitoring at 256 sites across Camden. There are 31 diffusion tube locations within 1km of the Proposed Development.

The diffusion tube data for those sites for 2019-2023 are presented in **Table 4.3**.

Table 4.3: LBS Annual Mean Diffusion Tube Monitoring Results 2019-2023

Site ID	Site Type	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m³)				
			2019	2020	2021	2022	2023
CAM81	Kerbside	0.1	**62.6**	**43.3**	**44.2**	**40.0**	**43.9**
CAM15	Roadside	0.2	-	-	24.1	24.3	26.5
CAM13	Roadside	0.2	-	-	23.0	22.6	24.5

Site ID	Site Type	Distance from Site (km)	Annual Mean NO_2 Concentration (µg/m^3)				
			2019	2020	2021	2022	2023
CAM14	Roadside	0.3	-	-	26.2	27.0	31.7
CAM86	Kerbside	0.3	**49.6**	29.5	32.9	30.8	29.5
CAM310	Roadside	0.5	-	-	-	-	34.4
CAM79	Urban Background	0.6	33.9	26.8	22.2	23.9	21.3
CAM311	Roadside	0.7	-	-	-	-	28.5
CAM241	Roadside	0.7	-	34.2	33.1	31.3	32.6
CAM243	Roadside	0.7	-	30.3	27.1	26.8	32.0
CAM242	Roadside	0.7	-	32.1	27.9	28.5	26.4
CAM80	Roadside	0.7	**49.5**	35.3	34.3	30.2	27.7
CAM245	Roadside	0.7	-	35.9	30.2	31.0	35.9
CAM252	Roadside	0.7	-	27.7	25.2	25.6	27.5
CAM248	Roadside	0.8	-	**44.4**	37.9	**42.6**	**50.9**
CAM251	Roadside	0.8	-	29.3	23.9	26.6	29.3
CAM312	Roadside	0.8	-	-	-	-	**40.5**
CAM189	Roadside	0.8	**40.0**	32.2	29.6	29.7	32.5
CAM249	Roadside	0.8	-	29.4	26.8	28.4	31.9
CAM247	Roadside	0.8	-	31.3	25.7	26.6	29.6
CAM246	Roadside	0.8	-	**46.3**	38.1	**43.9**	**49.6**
CAM244	Roadside	0.8	-	31.0	25.0	26.9	29.4
CAM313	Roadside	0.8	-	-	-	-	29.3
CAM250	Roadside	0.8	-	26.7	23.7	25.5	30.0
CAM182	Roadside	0.8	**43.8**	32.0	27.6	29.6	30.1
CAM319	Roadside	0.9	-	-	-	-	31.5
CAM316	Roadside	0.9	-	-	-	-	34.9
CAM196	Roadside	1.0	38.6	30.1	27.2	26.2	28.5
CAM71	Roadside	1.0	**65.3**	**46.6**	**46.5**	**43.2**	**47.5**
CAM301	Roadside	1.0	-	-	-	27.9	27.2
CAM46	Roadside	1.0	-	-	23.8	22.9	23.1

Note: Exceedance of the annual mean NAQO of 40µg/m^3 for NO_2 are highlighted in **bold**.

The closest diffusion tube monitoring location to the Proposed Development is CAM81 situated on Tottenham Court Road at a kerbside location (0.5m from nearest road). This diffusion tube exceeded the annual mean objective of 40 µg/m^3 consistently over the period (2019-2023). However, the façade of the

Proposed Development is located 5m from nearest road, facing Tottenham Court Road. Therefore, the diffusion tube locations due to its proximity to the road will have measured higher concentrations than at the Proposed Deevlopment.as annual mean NO_2 concentration reduce significantly with distance.

Monitoring locations CAM13, CAM14 and CAM15 are also within approximately 300m of the Proposed Development at roadside locations. These diffusion tubes all began monitoring in 2021 and have recorded concentrations well below the annual mean objective. These locations are also on relatively minor roads that would be more representative of the Alfred Place facing side of the Site.

As the Proposed Development is intended for commercial use, the 1-hour mean objective applies at this location. As outlined in LLAQM TG19, an annual mean NO_2 concentration above 60 µg/m^3 would indicate a likely exceedance of the 1-hour mean objective. As all concentrations near to the Site were below 60 µg/m^3 in 2022 and 2023 (post-covid), exceedances of the NO_2 1-hour mean at the Site are unlikely.

4.3 Background Maps

The Defra background maps[25] were used to assess the current background concentrations of NO_2, PM_{10} and $PM_{2.5}$ at and near to the Site. The resource provides estimated annual mean background concentrations of key pollutants at a resolution of 1x1km for the UK. Mapped background concentrations from the grid squares within the study area for the baseline year of 2023 and future years up to the Proposed Development opening year of 2027 are provided in **Table 4.4**.

Table 4.4: Defra Annual Mean Background Pollutant Concentrations (µg/m^3)

Grid Square	Year	NO_2	PM_{10}	$PM_{2.5}$
529500, 181500	2023	36.7	18.8	12.2
	2024	35.9	18.6	12.1
	2025	35.3	18.4	11.9
	2026	35.1	18.4	11.9
	2027	34.8	18.4	11.9
Air Quality Objective		**40**	**40**	**20**

The projected annual mean background concentrations are below their respective air quality objectives at the site of the Proposed Development. Background concentrations are predicted to decline annually, most notably in relation to NO_2. This is due to the advancement of technologies for emissions control, leading to lower emissions especially from road vehicles.

[25] Available at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

4.4 London Atmosphere Emissions Inventory

The area covered by the London Atmospheric Emissions Inventory (LAEI)[26]includes Greater London, as well as areas outside Greater London up to the M25 motorway.

The LAEI provides an estimate ground level concentrations of key pollutants NO_x, NO_2, PM_{10} and $PM_{2.5}$ across Greater London for years 2019, 2025 and 2030 using an atmospheric dispersion model. The 2025 mapped concentrations have been used as the most appropriate concentrations for the baseline year at the time of assessment.

Predicted mapped annual mean NO_2 concentrations at roadside locations across lengths of Tottenham Court Road and at the Proposed Development are below the objective (40µg/m^3). The highest predicted annual mean NO_2 concentrations in 2025 at the Proposed Development range between 27 µg/m^3 and 29 µg/m^3.

Predicted mapped annual mean concentrations for PM_{10} across the Proposed Development do not exceed 12 µg/m^3 in 2025. Predicted mapped annual mean concentrations for $PM_{2.5}$ across the Proposed Development do not exceed 10 µg/m^3 in 2025 This indicates that PM_{10} and $PM_{2.5}$ concentrations will remain below the AQOs and respective target value for $PM_{2.5}$.

4.5 Site Suitability Assessment

The review of current and future air quality within and near to the Proposed Developmentshows that background levels of air pollutants (NO_2, PM_{10}, $PM_{2.5}$) are expected to be well below the respective national air quality objectives in the current and future years. Given the proposed land uses (retail/office), exposure of users of the Proposed Development to air pollution will most likely be applicable over short-term averaging periods. The baseline review demonstrated that there have been no exceedances of the respective 1-hour (NO_2) and 24-hour (PM_{10}) air quality objectives at or near to the Site.

Therefore, the Site is suitable for the proposed end uses as part of the Proposed Development, such that future occupants and users will not be exposed to poor air quality

[26] London Atmospheric Emissions Inventory, 2019, available at: https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019

5 Construction Phase Assessment

5.1 Construction Dust

Major construction sites can give rise to increasing long-term and short-term PM_{10} concentrations at off-site locations and may also cause annoyance due to the soiling of surfaces by dust unless the appropriate mitigation measures are implemented. The impacts of dust therefore need to be addressed.

The assessment of dust during construction has been carried out using a qualitative risk-based appraisal with reference to the Proposed Development's location in relation to sensitive locations, the planned process and site characteristics, as described in the Institute of Air Quality Management (IAQM) guidance[27], and outlined in **Appendix B**.

5.1.1 Potential Sources

The construction process consists of a series of different operations, each with its own duration and potential for dust generation. Emissions from any single construction site can be expected to have a definable beginning and end, and to vary substantially over different phases of the construction process and over different tasks within each phase. There are potentially sensitive locations near to the Proposed Development.

The construction dust risk impact assessment comprises a qualitative risk-based appraisal of potential sources of dust and the impacts at the sensitive locations close to the Proposed Development. If required, a suite of recommended mitigation measures can be used to minimise the impact of dust during the construction phase of the development.

5.2 Construction Dust Risk Impact Assessment

5.2.1 Step 1: Screen the need for a detailed assessment.

There are receptors within 250m of site boundary and 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s). Therefore, further assessment is required and so needs to proceed to Step 2 – Step 4.

The risk of impacts on ecological receptors were screened out as there are no habitat sites within 50m of the Site or access roads up to 250m from the Site entrance.

[27] The Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction, January 2024.

5.2.2 Step 2: Assess the Risk of Dust Impacts

Step 2A Define the potential dust emission magnitude

Demolition: A review of all demolition activities has been considered for potential dust emissions. These activities include the partial demolition of external façade areas, some internal walls, and a roof demolition. Although the volume of existing building to be demolished is less than 12,000m^3 ('small classification') and there is no on-site crushing proposed, there will be demolition works at heights greater than 12m above ground. Therefore, the potential dust risk magnitude has been conservatively classified as **"High"**.

Earthworks: The area coverage of the Site is less than 18,000m^2. There will be no earthmoving equipment used and no bunds or stockpile enclosures created. Therefore, dust emission magnitude of earthworks activity has been classified as **"Small"**.

Construction: A review of all construction activities has been considered for potential dust emissions. The total building volume to be constructed is less than 12,000m^3 with the use of potentially dusty materials. No on-site piling is proposed. Therefore, the dust emission magnitude of construction activity has been classified as **"Small"**.

Trackout: The number of daily outward movements from heavy vehicles (>3,5t) is unknown at the time of reporting. Using professional judgement it is estimated that there would be fewer than 20 daily outward movements with no unpaved road length within the site. Therefore, the dust emission magnitude of trackout has been classified as **"Small"**.

Table 5.1 presents the dust emission magnitude for each activity based on the criteria set out in the IAQM Construction Dust Guidance.

Table 5.1:Dust Emission Magnitude

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	High	Small	Small	Small

Step 2B Define the sensitivity of the area

The Proposed Development is surrounded by predominantly commercial and some potentially residential receptors within 50m. As per IAQM guidance,[26] residential properties are classified as high sensitivity receptors whereas offices and retail properties are classified as medium sensitivity with regards to dust soiling and human health impacts

There are between 1 and 10 high sensitivity receptors (dwellings) within 20m of the Proposed Development. Following the descriptions set out in Box 6 of the IAQM guidance the sensitivity of the area to dust soiling effects as a result of demolition, earthworks and construction activities is classified as **"Medium"**. Due to existing background PM_{10} concentrations of less than 24 µg/m^3 and the above receptor count, the sensitivity of the area for human health impacts was classified as **"Low".**

As stated above, there are no ecological receptors within 50m of the Proposed Development, therefore ecological impacts were screened out of the assessment.

The sensitivity of the area to dust soiling and human health is presented in **Table 5.2**.

Table 5.2: Summary of Sensitivity of Surrounding Area

Potential Impact	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Medium
Human Health	Low	Low	Low	Low

Figure 3 presents a 20m-100m buffer around the Proposed Development showing the area impacted from construction.

Step 2C Define the risk of impacts

The dust emission magnitude for the various activities as defined in **Table 5.1** are combined with the sensitivity of the area provided in **Table 5.2**. This determines the level of the potential dust impact risk for each activity which is provided in **Table 5.3**. The risk category identified for each construction activity has been used to determine the level of mitigation required, as presented in **Appendix C**.

Table 5.3: Summary of Risk Effects

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	Low	Low	Low
Human Health	Medium	Negligible	Negligible	Negligible
Ecological	N/A – screened out from the assessment			

Overall, the Proposed Development has been determined as **'High Risk'** during demolition due to the height of the works, and '**Low Risk'** during construction, earthworks and trackout activities.

5.2.3 Step 3: Site Specific Mitigation

During the construction phase of the Proposed Development, it will be important to control dust levels to avoid significant impacts from dust during the construction phase, a number of mitigation measures and dust control actions will need to be put in place at the Proposed Development.

In our experience, the use of the comprehensive dust control measures recommended is normally sufficient to control any dust generated during the demolition and construction programme to an acceptable level.

During demolition, the risk of dust impacts will be '**High**' with regards to dust soiling and '**Medium**' for human health. **Table 5.4** sets out the IAQM's recommended mitigation measures for high-risk sites during demolition work.

The risk of dust impacts is reduced to '**low**' during construction, earthworks and trackout. A full list of the IAQM recommended mitigation measures for construction dust can be found in **Appendix C.**

It is recommended that demolition-specific mitigation measures corresponding to **'High Risk'** sites are implemented during demolition works, these are provided in **Table 5.4**. Given the **High Risk** nature of the site and the sensitivity of the surrounding area it may also be necessary to undertake dust monitoring particularly during the demolition phase.

For subsequent works, the risk then reduces to **'Low'** so mitigation measures corresponding to **'Low Risk'** sites should be implemented.

Table 5.4: Mitigation Measures Specific to Demolition for High-Risk Sites

Mitigation Measure	Recommendation for High Risk Sites
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	Highly Recommended
33. Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	Highly Recommended
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	Highly Recommended
35. Bag and remove any biological debris or damp down such material before demolition.	Highly Recommended

5.2.4 Step 4: Determine Significant Effects

The aim of the construction risk assessment is to determine the risk of dust impacts and then to identify appropriate mitigation measures to prevent significant effects on receptors. Therefore, providing the mitigation measures are in place and appropriately managed during the construction phase, it is concluded that the Proposed Development is not likely to generate unacceptable dust impacts to adjacent receptors during the demolition and construction stage. This is based on the information available at the time of the assessment.

5.3 Exhaust Emissions from Construction Vehicles and Plant

Ass outlined in section 3.2.3 and within the context of existing air quality within the local area (see Section 4), emissions from construction vehicles and plant will not materially impact local air quality, resulting in **no significant effect.**

5.4 Construction Dust Risk Impact Assessment Conclusions

Based on the information available at the time of assessment the potential impact from the Construction Phase of the Proposed Development has been undertaken. The objective of the assessment was to identify whether the Proposed Development would cause a significant impact on local air quality during the construction phases due to dust emissions and from emissions associated with the construction vehicles and plant.

The assessment of the potential dust levels associated with the construction of the Proposed Development shows that, although dust is likely to be generated from site activities, using the IAQM Construction Dust Guidance, the Proposed Development would be classed as a **'High risk site'** during the demolition phase and a **'Low risk site'** during construction phase and all other activities.

6 Operational Phase

The operational phase assessment has focussed on potential local air quality impacts associated with emissions generated by vehicle movements and building plant associated with the Proposed Development. Furthermore, the suitability of the Site for the proposed land uses has been assessed based on the outcomes of the baseline review and assessment of operational phase impacts.

6.1 Vehicle Emissions: Traffic Data & Screening

Traffic data were provided for the Proposed Development operation, with equivalent flows also provided for the existing development at the Site, to facilitate screening in line with the IAQM/EPUK criteria (see Section 3.3.1).

These data are presented in **Table 6.1** and focus on both taxi and servicing vehicle movements (all classed as LDVs).

Table 6.1: Changes to AADT movements as a Result of the Proposed Development

	Taxis AADT	Servicing AADT	Total AADT
Existing Development	131	76	207
Proposed Development	135	62 (58 LDVs and 4 HDVs)	197
Change	+4	-14	-10

The Proposed Development is predicted to generate 197 AADT, comprising 135 taxi movements and 62 servicing vehicle trips. This represents a net decrease of 10 AADT movements relative to the equivalent trips associated with the existing development.

Given that the Proposed Development will be car-free and is expected to result in a very small net reduction in taxi and servicing trips, the relevant traffic screening criterion (i.e. a change in 100 AADT) is not exceeded. Therefore, the need for further air quality assessment can be screened out with reference to the IAQM/EPUK guidance[21].

Within the context of the Site's location within an AQMA and existing air quality (see **Section 4**), the very small net reduction in traffic associated with the Proposed Development operation will have a negligible impact on local air quality, resulting in **no significant effect**.

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7 Air Quality Neutral Assessment

As outlined in paragraph 3.4, any new developments should be at least air quality neutral. In order to be air quality neutral, a new development must meet both the Building Emissions Benchmark (BEB) and Traffic Emissions Benchmark (TEB) set out in the (AQN) Guidance.

Developments can be assumed to meet the TEB if they have no additional motor vehicle parking and do not lead to an increase in vehicle movements. The guidance also states *"Taxi, delivery and servicing vehicles trips, as well as heavy vehicle trips produced by the operation of an industrial or commercial premises are not covered by Air Quality Neutral".* Given the Proposed Development is to be a car-free development, the assessment of traffic emissions has been scoped out.

The Proposed Development will replace the existing gas fired combustion plant with a 100% electric HVAC system. The back up power supply will not use a generator and instead make use of separate protected electrical circuits/local battery back-up. Therefore, the building will have no local emissions and the Proposed Development can be assumed to meet the BEB.

On the above basis, the Proposed Development will be classed as, at least, Air Quality Neutral, thereby adhering to the London Plan[13].

8 Conclusion

A qualitative air quality assessment has been undertaken for the planning application at 1 Alfred Place in London Borough of Camden. The aim of the assessment was to evaluate the suitability of the site for its intended use, assess whether there is the potential for the Proposed Development to impact on local air quality and determine whether the development will be Air Quality Neutral.

A baseline review of existing air quality conditions at and within the vicinity of the Site has been undertaken, utilising data available from LBC and Defra. Whilst the Site is located within the Camden AQMA and there have been exceedances of the NO_2 annual mean objective at the kerbside of Tottenham Court Road, levels of NO_2, PM_{10}, and $PM_{2.5}$ at the Site are expected to be well below the respective annual and short-term averaging period air quality objectives.

Based on the baseline review, the Site is **suitable for the proposed end uses included as part of the Proposed Development**, such that future occupants and users will not be exposed to poor air quality.

An assessment of the potential impacts on local air quality from construction phase activities has been completed for the Proposed Development with reference to IAQM guidance[19]. This identified that there is a risk of dust impacts associated with demolition and construction activities. Through good site practice and the implementation of appropriate mitigation measures, the impacts of dust and particulate matter releases on local air quality will be negligible, corresponding to **no significant effect**.

In terms of the operation phase, there is expected to a very small net decrease in daily vehicle movements associated with the Proposed Development relative to the existing site use. Therefore, the change in traffic on the local road network would be well below relevant IAQM/EPUK[21] guidance thresholds, such that further air quality assessment of vehicle emissions is not required. Given the outcomes of the baseline review, the net reduction in traffic associated with the Proposed Development is likely to have a **negligible impact** on local air quality, resulting in **no significant effect**.

The Proposed Development will benefit from a 100% electric heating, ventilation and air conditioning (HVAC) system. This will replace the existing gas-fired central heating, resulting in a net reduction in building emissions. The back up power supply will make use of separate protected electrical circuits/local battery back-up.

On this basis, the Proposed Development was also assessed to be, at least, Air Quality Neutral within the guidelines set by the London Plan[13] with respect to traffic and building emissions.

Therefore, with a net reduction in road traffic emissions and building plant emissions, the Proposed Development will have a **negligible impact** on local air quality, resulting in **no significant effect**.

This report has demonstrated that the Proposed Development complies with relevant national and local air quality policy, with no air quality constraints identified with respect to progressing the Proposed Development planning application.

Site Boundary

0 0.01 0.03 0.04 0.06

Kilometers

Rev.	Rev. Date	Drawing Suitability	Drawn	Checked	Appr'd
C01	06.09.2024	For Information	MB	MB	JS

Sweco UK Ltd
Eldon House, 2 Eldon Street
London
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SWECO

Client:
Great Portland Estates

Project:
The Courtyard Building

Drawing Title:
Figure 1: Site Location

Status Desc.	FINAL	Status	S2
Project No.	65211993	Scale	1:
Status Desc.	65211993-SWE-ZZ-XX-DR-J-FIGURE-1	Sheet Size	A3

Site Boundary
Automatic Monitoring Locations
DT Monitoring Locations

CAM301
CAM71
CD9
CAM55
CAM46
CAM196
CAM194
CAM73
CAM80
CAM204
CAM189
CAM79
CAM182
BL0
CAM81
CAM15
CAM13
CAM86
CAM14
CAM241
CAM252
CAM243
CAM251
CAM247
CAM242
CAM248
CAM246
CAM249
CAM250

Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

0 0.1 0.2 0.3 0.4 Kilometers

Rev.	Rev. Date	Drawing Suitability	Drawn	Checked	Appr'd
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SWECO

Client:
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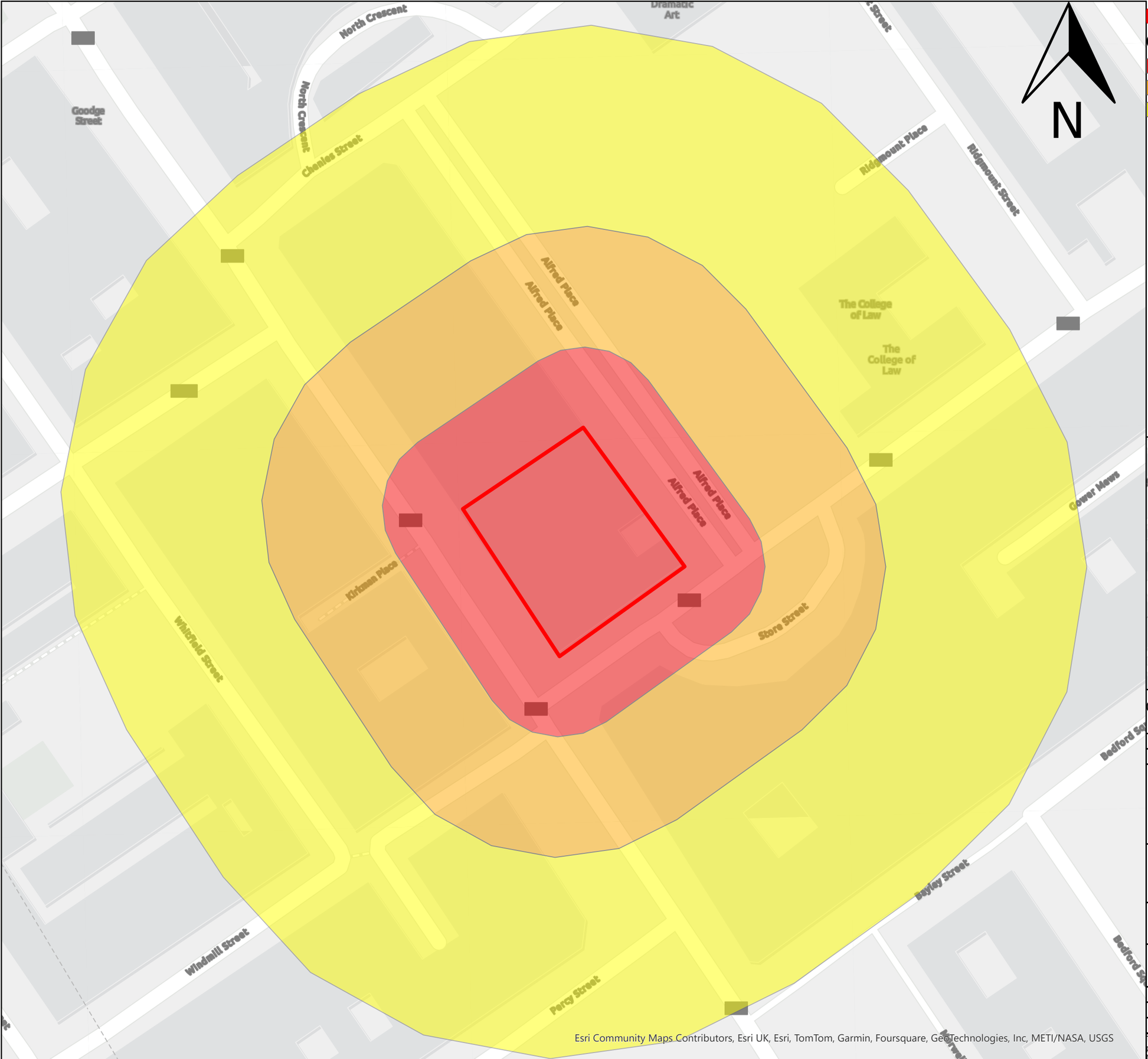
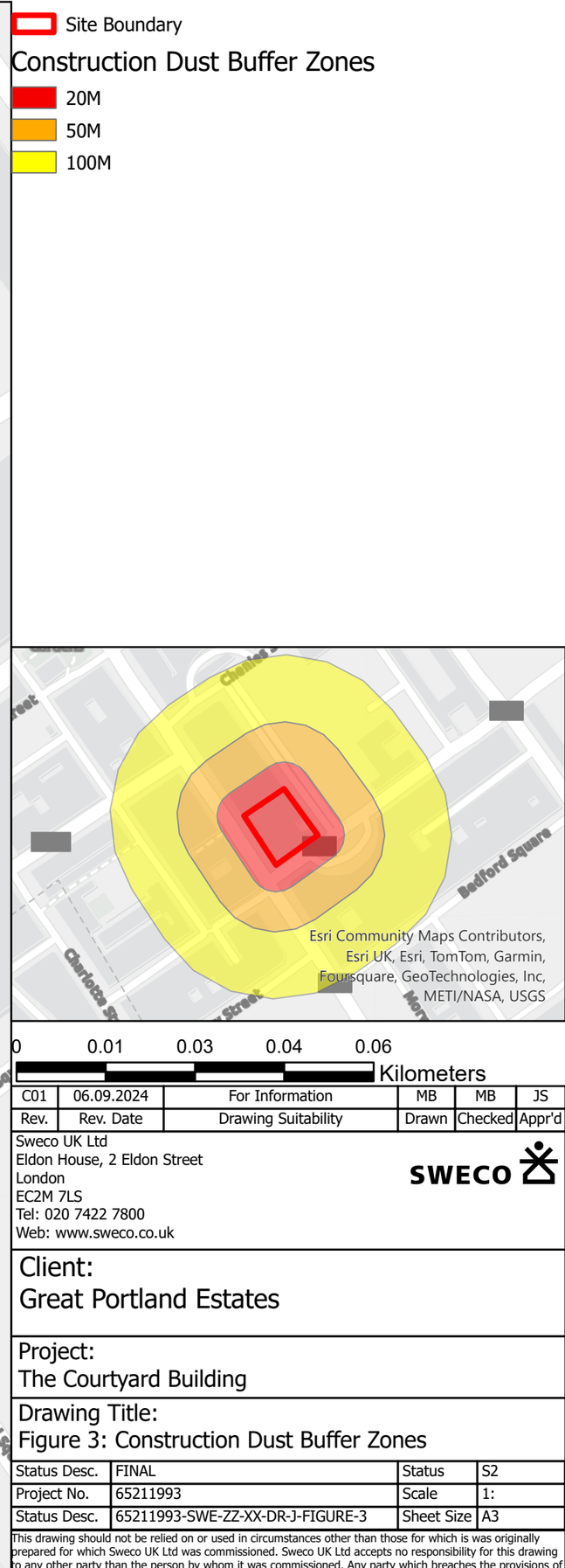
Project:
The Courtyard Building

Drawing Title:
Figure 2: Monitoring Locations

Status Desc.	FINAL	Status	S2
Project No.	65211993	Scale	1:
Status Desc.	65211993-SWE-ZZ-XX-DR-J-FIGURE-2	Sheet Size	A3





Rev.	Rev. Date	Drawing Suitability	Drawn	Checked	Appr'd
C01	06.09.2024	For Information	MB	MB	JS

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Client:
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Project:
The Courtyard Building

Drawing Title:
Figure 3: Construction Dust Buffer Zones

Status Desc.	FINAL	Status	S2
Project No.	65211993	Scale	1:
Status Desc.	65211993-SWE-ZZ-XX-DR-J-FIGURE-3	Sheet Size	A3

Appendix A- EPUK/IAQM Full Screening Criteria

Table A. 1: Stage 1 criteria to proceed to stage 2

Criteria to Proceed to Stage 2
A. **If any of the following apply:** • **10 or more residential units of a site area of more than 0.5ha;** • **More than 1,000m^2 of floor space for all other uses or a site area greater than 1ha.**
B. **Coupled with any of the following:** • **The development has more than 10 parking spaces;** • **The development will have a centralised energy facility or other centralised combustion process.**

Table A. 2: Indicative criteria at stage 2 to determine is an air quality assessment is required

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors.	A change of LDV flows of: • More than 100 AADT within or adjacent to an AQMA; • More than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A change of HDV flows of: • More than 25 AADT within or adjacent to an AQMA; • More than 100 AADT elsewhere.
Realign roads, ie changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic-lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: • More than 25 AADT within or adjacent to an AQMA; • More than 100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
Have one or more substantial combustion processes.	Where the combustion unit is: • Any centralised plant using biofuel.

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
	• Any combustion plant with single or combined thermal input >300kWh; • A standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year).
Have a combustion process of any size.	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way or their size and/or height.

Appendix B- IAQM Construction Dust Assessment Methodology

It is inevitable that with any development, demolition and construction activities would cause some disturbance to those nearby. Dust arising from most construction activities tends to be of a coarse nature, which through dispersion by the wind, can lead to soiling of property including windows, cars, external paintwork and laundry.

The ability of dust particles to remain suspended in the air depends on its shape, size and density. Coarse particles (>30µm) tend to be deposited within 100m of source. Finer particles, between 10-30µm, are generally deposited within 200 to 500m of source, while very fine particles (<10 µm), which remain suspended for longer, can travel up to 1km from source. The greatest proportion of construction dust is made up of coarse particles, thus the majority of dust emissions are deposited within 100m of source.

However, as well as giving rise to annoyance due to soiling of surfaces from dust emissions, there is evidence of major construction activities causing increases in long term PM_{10} concentrations and in the number of days exceeding the short term PM_{10} objective of 50µg/m^3. The potential for impacts to occur during the construction of a Proposed Development must therefore be considered, to ensure appropriate mitigation measures are applied to reduce potential impacts at adjacent receptors. However, it should be noted that disruption due to demolition and construction is a localised phenomenon and is temporary in nature.

During the construction of the Proposed Development, Lorries would require access to the site to deliver and remove materials; earthmoving plant and other mobile machinery will work on site and generators and cranes will also be in operation. These machines produce exhaust emissions; of particular concern are emissions of NO_2 and PM_{10}.

The assessment of construction impacts has followed the methodology set out within guidance produced by Institute of Air Quality Management (IAQM) on assessing impacts from construction activities and is set out below.

Prediction Method and Approach

To assess the potential impacts, the activities on construction sites are divided into four categories. These are:

- Demolition (removal of existing structures).
- Earthworks (soil-stripping, ground-levelling, excavation and landscaping).
- Construction (activities involved in the provision of a new structure).
- Trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

For each activity, the risk of dust annoyance, health and ecological impact is determined using three risk categories: low, medium and high risk. The risk category may be different for each of the four activities. The risk magnitude identified for each of the construction activities is then compared to the number of sensitive receptors in the near vicinity of the Proposed Development to determine the risks posed by the construction activities to these receptors.

Step 1: Screen the Need for an Assessment

The first step is to screen the requirement for a more detailed assessment. An assessment is required where there is:

:

- A 'human receptor' within:
  - 250m of the boundary of the site or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s); and/or
- An 'ecological receptor' within:
  - 50m of the boundary of the site; or
  - 50m of the route(s) used by the construction vehicles on the public highway, up to 250m from the site entrance(s)

Step 2A: Define the Potential Dust Emission Magnitude

This is based on the scale of the anticipated works and the proximity of nearby receptors. The risk is classified as small, medium or large for each of the four categories.

Demolition: The potential dust emission classes for demolition are:

- Large: Total building volume >75,000m^3, potentially dusty construction material (eg Concrete), on site crushing and screening, demolition activities >12m above ground level.
- Medium: total building volume 12,000m^3 - 75,000m^3, potentially dusty construction material, demolition activities 6-12m above ground level.
- Small: total building volume <12,000m^3, construction material with low potential for dust release (eg metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.

Earthworks: This involves excavating material, haulage, tipping and stockpiling. The potential dust emission classes for earthworks are:

- Large: Total site area >110,000m^2, potentially dusty soil type (eg clay, which would be prone to suspension when dry due to small particle size), >ten heavy earth moving vehicles active at any one time, formation of bunds >6m in height, total material moved >100,000 tonnes.
- Medium: Total site area 18,000m^2 - 110,000m^2, moderately dusty soil (eg silt), five - ten heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height.
- Small: Total site area <18,000m^2, soil type with large grain size (eg sand), <five heavy earth moving vehicles active at any one time, formation of bunds <3m in height.

Construction: The important issues when determining the potential dust emission magnitude include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The categories are:

- Large: Total building volume >75,000m^3, on site concrete batching, sandblasting.
- Medium: Total building volume 12,000m^3 - 75,000m^3, potentially dusty construction material (eg concrete), on site concrete batching.
- Small: Total building volume <12,000m^3, construction material with low potential for dust release (eg metal cladding or timber).

Trackout: The risk of impacts occurring during trackout is predominantly dependent on the number of vehicles accessing the Site daily. However, vehicle size and speed, the duration of activities and local geology are also factors which are used to determine the emission class of the Site as a result of the trackout. The categories are:

- Large: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (eg high clay content), unpaved road length > 100m.
- Medium: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (eg high clay content, unpaved road length 50-100m.
- Small: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health (PM_{10}) and ecological receptors. The sensitivity of the area considers the following factors:

- The specific sensitivities of receptors in the area.
- The proximity and number of receptors.
- In the case of PM_{10}, the local background concentration.
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Table B.1 is used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table B. 1: Examples of factors defining sensitivity of an area

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	Users can reasonably expect enjoyment of a high level of amenity. The appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be	10 – 100 dwellings within 20m of site. Local PM_{10} concentrations close to the objective (eg annual mean 36 -40µg/m^3),	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particular dust

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. eg dwellings, museums and other important collections, medium and long-term car parks and car showrooms.	eg residential properties, hospitals, schools and residential care homes.	sensitive species such as vascular species included in the Red List for Great Britain. eg A Special Area of Conservation (SAC).
Medium	Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home. The appearance, aesthetics or value of their property could be diminished by soiling. The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. eg parks and places of work.	Less than 10 receptors within 20m. Local PM_{10} concentrations below the objective (eg annual mean 30-36µg/m^3). eg office and shop workers but would generally not include workers occupationally exposed to PM_{10} as protection is covered by the Health and Safety at Work legislation	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition eg A Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected. Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. There is transient exposure, where the people or property would reasonably	Locations where human exposure is transient. No receptors within 20m. Local PM_{10} concentrations well below the objectives	Locations with a local designation where the features may be affected by dust deposition. eg Local Nature Reserve with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	be expected to be present only for limited periods of time as part of the normal pattern of use of the land. eg playing fields, farmland unless commercially sensitive horticultural, footpaths, short lived car parks and roads.	(less than 75%). eg public footpaths, playing fields, parks and shopping streets.	

Based on the sensitivities assigned to the different receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification can be defined for each. Tables B.2 to B.4 indicate the criteria used to determine the sensitivity of the area to dust soiling, human health and ecological impacts.

Table B. 2: Sensitivity of the area to dust soiling on people and property

Pollutant	Concentrations	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table B. 3: Sensitivity of the area to human health impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32µg/m³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32µg/m³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28µg/m³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24µg/m³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32µg/m³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32µg/m³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28µg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
	<24µg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low		≥1	Low	Low	Low	Low

Table B. 4: Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Define the Risk of Impacts

The final step is to combine the dust emission magnitude determined in step 2A with the sensitivity of the area determined in step 2B to determine the risk of impacts with no mitigation applied. Tables B.5 to B.7 indicate the method used to assign the level of risk for each construction activity.

The identified risk of impact is then used to identify appropriate mitigation measures for inclusion with a Dust Management Plan (DMP) which is usually incorporated within the Site's Construction Environmental Management Plan (CEMP).

Table B. 5: Risk of dust impacts from demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table B. 6: Risk of dust impacts from earthworks/construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table B. 7: Risk of dust impacts from trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Appendix C- IAQM Mitigation Measures

IAQM mitigation measures

The risk category identified for each construction activity in Section 5 has been used to determine the level of mitigation required, which is presented herein. In general, it is considered that the Site is in requirement of low-risk dust control measures. It is recommended that the 'desirable' (D) and 'highly recommended' (H) measures set out below are incorporated.

Table C. 1: Mitigation for all sites

Mitigation Measure	Risk level		
	Low	Medium	High
Communications			
1. Develop and implement a stakeholder **c**ommunications plan that includes community engagement before work commences on site.	N	H	H
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
3. Display the head or regional office contact information.	H	H	H
4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.	D	H	H
Site Management			
5. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H	H	H
6. Make the complaints log available to the local authority when asked.	H	H	H
7. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.	H	H	H
8. Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and	N	N	H

Mitigation Measure	Risk level		
	Low	Medium	High
particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.			
Monitoring			
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.	D	D	H
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	H	H	H
11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
12. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	H	H	H
Preparing and maintaining the site			
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	D	H	H
16. Avoid site runoff of water or mud.	H	H	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	D	H	H

Mitigation Measure	Risk level		
	Low	Medium	High
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	H	H	H
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
22. Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D	D	H
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	N	H
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	N	D	H
Operations			
26. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate.	H	H	H
28. Use enclosed chutes and conveyors and covered skips.	H	H	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H

Mitigation Measure	Risk level		
	Low	Medium	High
Waste Management			
31. Avoid bonfires and burning of waste materials.	H	H	H
Note: 'D' denotes Desirable, 'H' denotes Highly Recommended 'N' denotes Not required			

Table C. 2: Measures specific to demolition

Mitigation Measure	Risk		
	Low	Medium	High
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
33. Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	H	H	H
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
35. Bag and remove any biological debris or damp down such material before demolition.	H	H	H
Note: 'D' denotes Desirable, 'H' denotes Highly Recommended 'N' denotes Not required			

Table C. 3: Measures specific to earthworks

Mitigation Measure	Risk		
	Low	Medium	High
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	N	D	H
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	N	D	H
38. Only remove the cover in small areas during work and not all at once.	N	D	H
Note: 'D' denotes Desirable, 'H' denotes Highly Recommended 'N' denotes Not required			

Table C. 4: Measures specific to construction

Mitigation Measure	Risk		
	Low	Medium	High
39. Avoid scabbling (roughening of concrete surfaces) if possible.	D	D	H
40. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	D	H	H
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	N	D	H
42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D
Note: 'D' denotes Desirable, 'H' denotes Highly Recommended 'N' denotes Not required			

Table C. 5: Measures specific to track-out

Mitigation Measure	Risk		
	Low	Medium	High
43. Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	D	H	H
44. Avoid dry sweeping of large areas.	D	H	H
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
47. Record all inspections of haul routes and any subsequent action in a site logbook.	D	H	H
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
50. Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	N	H	H

51. Access gates to be located at least 10 m from receptors where possible.	N	H	H
Note: 'D' denotes Desirable, 'H' denotes Highly Recommended 'N' denotes Not required			

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