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AIR QUALITY ASSESSMENT

REPORT REF.

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Mark Chapman

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Statement of Competence

The following authors of this report are Members of the Institute of Air Quality Management (IAQM) and possess the requisite qualifications, expertise, and experience to conduct robust air quality assessments and analyses in accordance with regulatory standards and best practices.

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1 Introduction

Background

1.1 Ardent Consulting Engineers (ACE) have been commissioned by Lichfields, on behalf of 13-17 Red Lion Square LLP (the client), to prepare an Air Quality Assessment (AQA) in support of a planning application for the following Proposed Development at 14 Red Lion Square, Camden (the Site):

> *"Refurbishment and change of use from class E office use to class C3 residential, as one self-contained family dwelling, incl. bricking up of windows in rear column/ formation of rear lift shaft."*

1.2 The Proposed Development will be a car-free development, as noted in the planning statement prepared by Lichfields.

1.3 In November 2019, the London Borough of Camden Council (LBCC) granted planning permission (ref. 2016/3635/P) for the same Site for the change of use of 14-17 Red Lion Square from office to residential use. This new application is for 14 Red Lion Square only.

1.4 An Air Quality Statement (ref. Y740-008), prepared by ACE, was submitted as part of the previous application. The report assessed the potential impacts of existing and future traffic levels on the proposed residential development. The report concluded that appropriate mitigation measures would be required to ensure suitable air quality for future occupants.

Site Location and Context

1.5 The Site is located within the administrative boundary of LBCC and is located on land at approximate National Grid Reference (NGR) 525083 (x), 196061 (y) and is shown below:

Figure 1-1: Site Location

1.6 The Site is located on the southern side of Red Lion Square Gardens, which is a public open garden along Red Lion Square. The Site comprises one Georgian terraced house (No.14), which is Grade II listed. The building is 3 storeys in height plus attic and basement levels.

1.7 The existing property at No.14 is currently subdivided into offices and storage/ancillary areas, along with the neighbouring properties Nos.15-17. Collectively they are known as the Barbon Buildings.

1.8 The Proposed Development has the potential to cause impacts during both construction and operation. An AQA was therefore undertaken to determine baseline conditions and consider potential impacts and effects associated with the Proposed Development, in air quality terms, as detailed in the following report.

2 Approach

2.1 The approach to preparing an AQA in the UK typically involves the following steps:

Screening and Scoping

2.2 Screening identifies if an AQA is needed by evaluating potential emissions and their likely impacts. This involves considering the type and scale of the project and its proximity to sensitive receptors (e.g., residential areas, schools, hospitals).

2.3 Scoping then defines the scope of the assessment, including the pollutants to be considered, the geographical area to be covered, and the receptors to be included.

2.4 The relevant screening assessment is provided below, followed by the scope of assessment determined to be required to appropriately assess the potential air quality impacts and effects of the Proposed Development.

Screening

2.5 To screen the need for detailed assessment, Table 1 of the adopted Camden Planning Guidance (CPG) on Air quality (see Section 3 for further details), which provides "Air Quality Assessment triggers", has been reviewed:

Criteria met →				→ Assessments required		
Scale	***Area of poor air quality[1]***	***Scheme brings sensitive receptors***	***Scheme brings air quality impacts [2]***	***Air Quality Assessment type***	***Air Quality Neutral***	***Construction and Demolition Impacts***
Major	Yes	Yes	Yes	Detailed	Required	Required
			No			
		No	Yes	Detailed		
			No	Basic		
	No	Yes	Yes	Detailed		
			No	Basic		
		No	Yes	Detailed		
			No	Basic		
Minor	Yes	Yes	Yes	Detailed	*Not required*	*[3]May be required*
			No	Basic		
		No	Yes	Basic		
			No	*Not required*		
	No	Yes	Yes	Detailed		
			No	*Not required*		
		No	Yes	Basic		
			No	*Not required*		

Source: Camden Planning Guidance

Figure 2-1: LBCC Air Quality Assessment triggers

2.6 Against the above criteria the following conclusions are reached:

- The Proposed Development is a Minor Scale development;
- The Site is considered to be in an area of poor air quality ;
    - see Section 4 for further details
- The Proposed Development will introduce new sensitive receptors through the change of use from Office to Residential;

- The Proposed Development is not expected to result in operation phase air quality impacts, as no combustion plant are proposed, and no additional parking of vehicle movements are proposed/expected.

2.7 On this basis, a 'Basic' assessment is required, which considers potential impacts during the construction phase, and the exposure of new receptors to existing levels of poor air quality, as follows:

Construction Phase

Fugitive Dust Emissions: Impact

2.8 The construction phase of the Proposed Development has the potential for fugitive dust emissions to occur owing to construction phase activities, primarily due to minor demolition activities.

2.9 As such, further assessment of potential dust impacts has been undertaken (see Appendix A for the construction phase methodology and Section 5 for the assessment).

Construction Traffic Emissions: Impact

2.10 The Institute of Air Quality Management (IAQM) advise that from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse impacts on local air quality would be caused and in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have been screened out.

Road Traffic Emissions: Exposure / Site Sensitivity

2.11 The Proposed Development will introduce new areas of sensitive exposure, which are sensitive to long-term and short-term nitrogen dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$) concentrations. As such, consideration has been given to potential exposure to emissions from road traffic on the local road network.

2.12 Conclusions on the exposure assessment are made using data from the baseline review in Section 4 of this report, which includes consideration of local traffic data, proximity to identified pollution sources, air quality monitoring information, and modelled annual mean background concentrations from both Defra's UK-AIR data and the London Atmospheric Emissions Inventory (LAEI) 2019.

Air Quality Neutral

2.13 Under London Plan Policy SI1: Air Quality, all developments in London are required to be Air Quality Neutral (AQN).

2.14 While the screening criteria against LBCC criteria resulted in no requirement for an AQN assessment, the Proposed Development has also been assessed in accordance with the more recent *2023 London Plan Guidance: Air Quality Neutral* produced by the Greater London Authority (GLA), to determine whether the Proposed Development is AQN.

Scope

Scoped In

2.15 The following elements have been included with the scope of the AQA due to the screening assessment identifying a risk of potential effects requiring further assessment:

1. Construction Phase
    a. Construction Activities (Impacts)
        i. Dust, PM_{10}
2. Operation Phase
    a. Road traffic emissions (Exposure)
        i. NO_2, PM_{10}, $PM_{2.5}$
    b. Air Quality Neutral Assessment

Scoped Out

2.16 The following elements have been excluded from the detailed scope of the AQA based on the outcome of the screening assessment:

1. Construction Phase
    a. Construction Traffic Emissions (Impacts)
2. Operation Phase
    a. Operational Traffic Emissions (Impacts)
        i. Human Health
            A. NO_2, PM_{10}, $PM_{2.5}$
    b. Combustion Plant Emissions (Impacts)
        i. NO_2, PM_{10}, $PM_{2.5}$

3 Policy, Legislation and Guidance

3.1 To inform the assessment the following Policy, Legislation, and Guidance have been considered:

Policy

National Planning Policy

National Planning Policy Framework

3.2 The National Planning Policy Framework (NPPF) 2024 sets out the Government's planning policies for England and how these are expected to be applied. The purpose of the planning system is to contribute to the achievement of sustainable development. To ensure this, the NPPF recognises 3 overarching objectives, including the following of relevance to air quality:

> *"Chapter 2 Achieving sustainable development*
>
> *Para. 8*
>
> *c) an environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."*

3.3 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

> *"Chapter 15 Conserving and enhancing the natural environment*
>
> *Para. 187*
>
> *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 to improve local environmental conditions such as air and water quality;"

3.4 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Ground conditions and pollution

Para. 198

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.

…"

Para. 199

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. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions

should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

3.5 The implications of the NPPF have been considered throughout this assessment.

Regional Planning Policy

The London Plan

3.6 In London, a London Plan has been developed (Mayor of London, 2021). This includes a number of references to air quality; however, these are all incorporated into policy SI1: Improving Air Quality, which states:

"

A. Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B. To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:

1. Development proposals should not:

a) lead to further deterioration of existing poor air quality;

b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits; and

c) create unacceptable risk of high levels of exposure to poor air quality.

2. In order to meet the requirements in Part 1, as a minimum:

a) development proposals must be at least Air Quality Neutral;

b) *development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures;*

c) *major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1; and*

d) *development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.*

C. *Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:*

a) *how proposals have considered ways to maximise benefits to local air quality; and*

b) *what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*

D. *In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.*

E. *Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on site. Where it can be demonstrated that emissions cannot be further reduced by on site*

measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development."

Local Planning Policy

3.7 LBCC has adopted several planning documents that together form the development plan for Camden. This is the starting point for planning decisions in the Borough. The Camden Local Plan is the key strategic document in LBCC's development plan. It sets out the vision for shaping the future of the Borough and contains policies for guiding planning decisions. The Local Plan was adopted by Council in July 2017.

3.8 Local Plan policy CC4 seeks to ensure that development does not harm local air quality and limits exposure to poor air quality.

3.9 Local Plan Policy CC4 states:

"The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the Borough

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

AQAs are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and

include appropriate mitigation measures to be secured in a Construction Management Plan."

Local Air Quality Management

3.10 Under Section 82 of the Environment Act (1995) (Part IV), as amended by the Environment Act (2021), Local Authorities (Councils) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This Review and Assessment of air quality involves comparing present and likely future pollutant concentrations against relevant standards and objectives (see Table 3-1).

3.11 If it is predicted that levels at locations of relevant exposure, as summarised in Table 3-2, are likely to be exceeded, the Council is required to declare an Air Quality Management Area (AQMA). For each AQMA the Council is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of compliance with the AQALs.

Camden AQAP

3.12 Under the system of LAQM, LBCC are required to regularly review and assess air quality within the Borough and determine if the AQALs are likely to be achieved.

3.13 The Camden Clean Air Strategy 2019-2034 sets out the strategic objectives for realising the *'vision for a Borough in which no person experiences poor health as a result of the air they breathe'.* The Camden Clean Air Action Plan 2023-2026 describes the actions that will be taken over the period 2023-2026. This document goes beyond the legal requirements by committing to more ambitious air quality standards and including pollution sources not usually addressed by local authorities.

3.14 Camden has committed to achieving the revised World Health Organization (WHO) air quality guidelines in response to the scientific evidence about the impact of air pollution on health. The deadline LBCC have set for achieving the WHO limits is 2034. Additionally, LBCC have set bespoke interim targets. The LBCC targets are shown in in Table 3-1.

Legislation

3.15 There are 2 sets of air quality legislation which include ambient air quality thresholds for the protection of public health that apply in England, these include legally binding limit values originally set by the European Union (EU) Directive on ambient air quality and cleaner air for Europe (2008/50/EC) (which were transposed into UK law through the Air Quality Standards Regulations 2010), and regulations implementing national air quality objectives as set out in the Air Quality Strategy (AQS) 2023 for England which local authorities are required to work towards achieving.

3.16 The AQS sets out the Government's policies and framework for improving air quality in the UK with the aim of meeting the requirements of the 2008/50/EC Directive. The AQS also outlines the Limit Values, Target Values, Standards, Objectives, Critical Levels, Critical Loads and Exposure Reduction Targets for the protection of human health and the environment.

3.17 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 also brought forward a new target level for $PM_{2.5}$.

3.18 The relevant Limit Values, Target Values, Standards, Objectives and Exposure Reduction Targets are collectively termed AQALs throughout this report and are shown below in Table 3-1.

Table 3-1: Air Quality Assessment Levels (AQALs)

Pollutant	AQAL	
	Concentration (µg/m³)	**Averaging Period**
NO_2	40 *38*	Annual mean *Adopted by LBCC (40µg/m³ less 5%)*
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
	30	*Annual Mean LBCC Target - to be met by 2026*
	20	*Annual Mean LBCC Target - to be met by 2030*
	10	*Annual Mean WHO guideline (LBCC Target) - to be met by 2034*

Pollutant	AQAL	
	Concentration (µg/m³)	Averaging Period
PM_{10}	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
	40	Annual mean
	20	*Annual Mean LBCC Interim Target - to be met by 2026*
	15	*Annual Mean WHO guideline (LBCC Target) - to be met by 2030*
$PM_{2.5}$	20	Annual mean
	12	Annual Mean Interim Target (AMIT) - To be met across England by 2028
	10	Annual Mean Concentration Target (AMCT) - To be met across England by 2040
	10	*Annual Mean LBCC Interim Target - to be met by 2030*
	5	*Annual Mean WHO guideline (LBCC Target) - to be met by 2034*

Notes: LBCC AQAP Targets shown in *Italics.*

Guidance

National Guidance

National Planning Practice Guidance

3.19 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (NPPG), which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The NPPG summarises the importance of air quality in planning and the key legislation relating to it.

Defra Technical Guidance

3.20 Table 3-2 summarises the advice provided in Defra's Local Air Quality Management Technical Guidance 2022 (LAQM.TG (22)) on where the AQALs for pollutants considered within this report apply.

Table 3-2: Examples of Where the AQALs Apply

Averaging Period	AQAL Should Apply At	AQAL Should 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. 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	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 8-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 be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

3.21 As noted in LAQM.TG (22), it can be considered that exceedances of the NO_2 1-hour mean AQAL may occur at roadside sites if the annual mean is above 60µg/m^3.

3.22 With a similar approach to NO_2, LAQM.TG(22) recommends that where annual mean PM_{10} concentrations fall below 32µg/m^3 the 24-hour AQAL is unlikely to be exceeded.

Regional Guidance

London Local Air Quality Management (LLAQM) Technical Guidance 2019

3.23 Consideration has been given to London Local Air Quality Management Technical Guidance 2019 (LLAQM. TG (19)), which was prepared by the GLA to support London boroughs in carrying out their duties under the Environment Act and connected regulations. It applies to London's 32 boroughs (and the City of London).

Air Quality Neutral

3.24 Improving London's air quality is one of the major challenges facing the capital and as a result, Policy SI1 of the London Plan includes requirements for new development to be Air Quality Neutral. To assist developers, boroughs and others involved in designing and planning new development, London Plan Guidance on Air Quality Neutral has been prepared.

3.25 The Air Quality Neutral guidance sets air quality benchmarks for all development, to ensure that their transport and building emissions do not worsen air quality in London. The guidance also outlines a simplified approach for minor developments.

Local Guidance

Camden Planning Guidance (CPG) on Air quality

3.26 LBCC has prepared the CPG on Air quality to support the policies in the Camden Local Plan 2017. This guidance is therefore consistent with the Local Plan and forms a Supplementary Planning Document (SPD) which is an additional "material consideration" in planning decisions.

Non-statutory guidance

3.27 The following guidance documents have been reviewed / referred to in preparing this AQA:

- The Environmental Protection UK (EPUK) & IAQM 'Land use Planning & Development Control: Planning for Air Quality, V1.2' guidance;
- The IAQM's 'Assessment of dust from demolition and construction 2024 V2.2' guidance,
- Defra's Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance, and
- The GLA's Sustainable Design and Construction supplementary planning guidance (SPG) 2014.

4 Baseline Conditions

4.1 Existing and likely future air quality conditions in the vicinity of the Site have been reviewed to provide a baseline for the assessment, as shown below:

Local Air Quality Management

Air Quality Management Areas

4.2 LBCC has undertaken Review and Assessment of air quality within their area of jurisdiction and as a result, the whole of Camden is an AQMA as it does not meet national air quality objectives for NO_2 and *"because it is widely accepted that there is no safe level for particulates (PM_{10} and smaller)"*.

4.3 As such, the Site is located within the Borough-wide Camden AQMA.

Air Quality Focus Areas

4.4 The Council, in conjunction with the GLA, have also declared several AQFAs, identified as hotspot locations where there are a high number of sensitive receptors in areas of poor air quality.

4.5 The closest of these AQFAs to the Site is the Holborn High Street and Southampton Row Junction AQFA, which is approximately 20m south of the Site, as shown in Figure 4-1.

Local Emission Sources

Point Sources

4.6 A desk-based review of data from the National Atmospheric Emissions Inventory (NAEI) has been undertaken to identify large point sources, combustion plant releases and industrial installations in the vicinity of the Site. No such pollution sources have been identified in the Site locale and are therefore not considered further.

Road Traffic Sources

4.7 Red Lion Square is a one-way horseshoe road that can only be accessed at the northern entry on Drake Street. There is no access at the southern entry. There is a small amount of street parking which lines Red Lion Square. Red Lion Square is not considered to be a significant source of road traffic emissions.

4.8 The primary source of air pollution in proximity to the Site is therefore considered to be emissions from road traffic using the surrounding local road network, namely Theobolds Road and Drake Street / Procter Street.

4.9 Baseline Annual Average Daily Traffic (AADT) flows from both the LAEI 2019 and Department for Transport Road Traffic Statistics have been reviewed for each of these roads:

- Theobolds Road:
    - AADT flows in the range of 10,000 – 30,000 vehicles per day. Therefore, this road can be classified as a 'busy' Road;
- Drake Street / Procter Street:
    - AADT flows in the range of 10,000 – 30,000 vehicles per day. Therefore, this road can also be classified as a 'busy' Road;

4.10 Defra's guidance states that at distances of more than 50m from a busy road, it is anticipated that NO_2 concentrations will have been diluted to the local urban background concentrations.

4.11 The Site is more than 50m from each of these main pollution sources, and therefore it is reasonable to assume that baseline air quality conditions at the Site would be most comparable to background concentrations.

UK-AIR Modelled Background Concentrations

4.12 Predictions of background pollutant concentrations on a 1km-by-1km grid basis have been produced by Defra for the entire of the UK to assist Councils in their Review and Assessment of air quality.

4.13 The Site is in grid square NGR: 530500, 181500. Annual mean background data for this location was obtained from the Defra website for 2023 (the baseline year), 2025 (the year of assessment), 2028 (to be consistent with the AMIT for $PM_{2.5}$), and 2026, 2030 and 2034 (future year scenarios consistent with LBCC's AQAL targets) and is summarised in Table 4-1:

Table 4-1: UKAIR Background Concentrations

Pollutant	Predicted Background Concentration (µg/m^3)					
	2023	2025	2026	2028	2030	2034
NO_2	31.5	29.5	28.7	27.4	26.8	25.3
PM_{10}	17.9	17.8	17.7	17.6	17.5	17.3
$PM_{2.5}$	9.7	9.5	9.5	9.3	9.2	9.0

4.14 The data in Table 4-1 show that:

- Annual mean background concentrations of NO_2 are modelled to be:
  - More than 5% below the annual mean AQAL in all years;
  - Below the LBCC 2026 bespoke interim target in 2026;
  - Above LBCC 2030 bespoke interim target in 2030, and
  - Above the WHO guideline, as adopted by LBCC, in 2034.

- Annual background concentrations of PM_{10} are modelled to be:
  - Below the annual mean AQAL in all years;
  - Below the LBCC 2026 bespoke interim target in 2026, and
  - Above the WHO guideline, as adopted by LBCC, in 2030.

- Annual background concentrations of $PM_{2.5}$ are modelled to be:
  - Below the annual mean AQAL in all years;

- Below the AMIT in 2028;
- Below the LBCC 2030 bespoke interim target, which also corresponds to below the AMCT (which is not applicable until 2040), in 2030, and
- Above the WHO guideline, as adopted by LBCC, in 2034.

4.15 Concentrations of all pollutants are predicted to decline incrementally each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles and strategies to reduce emissions across all sectors.

London Atmospheric Emissions Inventory

4.16 The LAEI 2019 is the latest version of the London Atmospheric Emissions Inventory. It includes modelled 2019, 2025 and 2030 ground-level concentrations of annual mean NO_2, PM_{10} and $PM_{2.5}$ in $\mu g/m^3$ at a 20m grid resolution.

4.17 Annual mean LAEI baseline data for the Site for 2019, 2025 and 2030 are summarised in Table 4-2:

Table 4-2: LAEI Baseline Concentrations

Pollutant	Predicted Background Concentration ($\mu g/m^3$)		
	2019	2025	2030
NO_2	38.4	28.3	22.8
PM_{10}	21.9	19.5	18.2
$PM_{2.5}$	13.5	11.9	10.9

4.18 The LAEI data show that:

- Annual mean baseline concentrations of NO_2 are modelled to be:
  - Below the annual mean AQAL in 2019 (but within 5%), 2025 and 2030;
  - Below the LBCC 2026 bespoke interim target in 2025, and
  - Above the LBCC 2030 bespoke interim target in 2030.
- Annual baseline concentrations of PM_{10} are modelled to be:
  - Below the annual mean AQAL in 2025 and 2030;

- Below the LBCC 2026 bespoke interim target in 2025, and
- Above the WHO guideline, as adopted by LBCC, in 2030.

- Annual baseline concentrations of $PM_{2.5}$ are modelled to be:
  - Below the annual mean AQAL in all years, and
  - Below the AMIT in 2025 and 2030.

4.19 As LAEI data are only provided for specific years, no direct comparison can be made to LBCC bespoke interim targets or future $PM_{2.5}$ targets applicable in other years (e.g., 2028, 2034 or 2040).

Local Air Quality Monitoring

Automatic (Continuous) Monitoring

4.20 LBCC undertook automatic (continuous) monitoring at 2 sites during 2023. However, the closest of these (ABN1) is c.4km south east of the Site and therefore data are not considered representative of likely baseline conditions and the Site and likely study area.

Passive (Diffuse) Monitoring

4.21 Annual mean NO_2 concentrations from the closest LBCC monitoring locations to the Site are reported below in Table 4-3. Monitoring locations are shown in Figure 4-1:

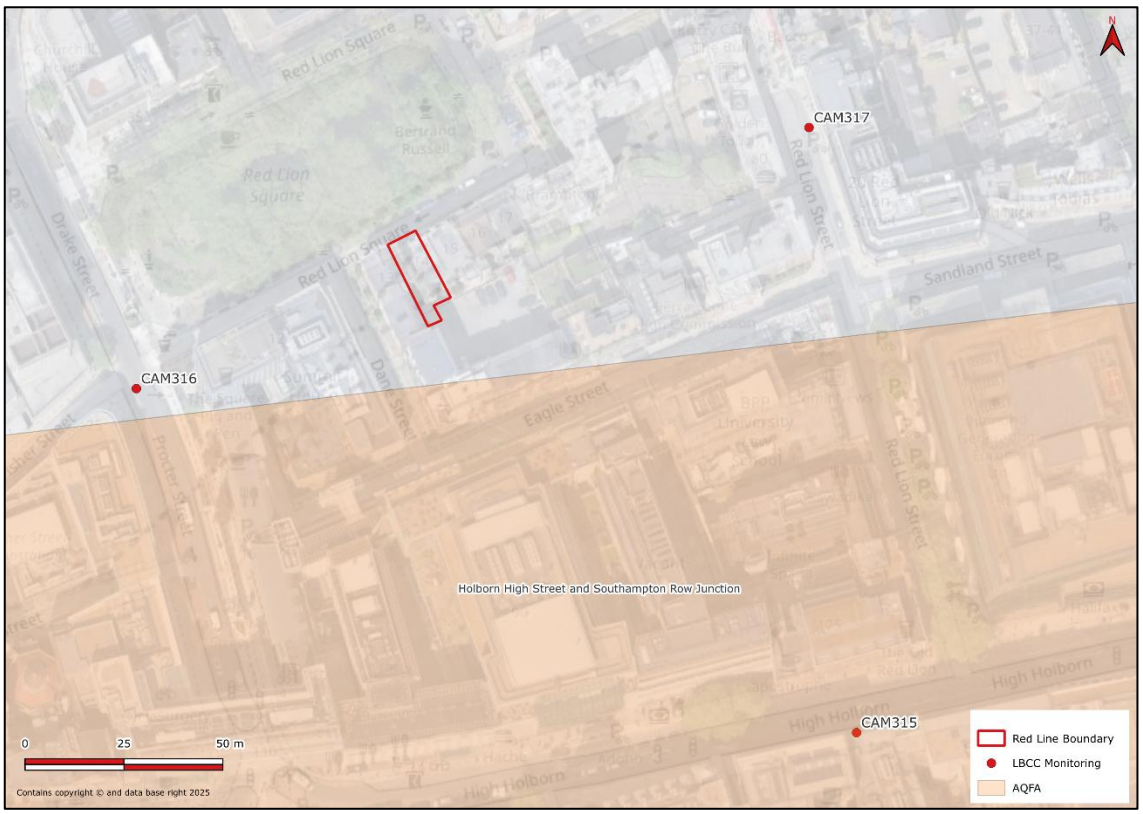


Figure 4-1: LBCC monitoring locations

4.22 Data was obtained from the LBCC Air Quality Annual Status Report for 2023 (published in August 2024), which is the latest report available. Data for the closest monitoring locations are only available as annual mean concentrations in 2023, as the diffusion tubes were not installed prior to this.

Table 4-3: Local Monitoring – NO_2

Site	Distance to Site (Km)	Monitor Type	Monitored NO_2 Concentration ($\mu g/m^3$)
			2023
CAM316	0.07	Diffusion Tube	34.9
CAM317	0.10	Diffusion Tube	26.3
CAM315	0.15	Diffusion Tube	**44.1**

Notes: Applicable AQAL exceedance shown in **Bold** (Monitoring data for 2023 so LBCC interim targets not applicable).

4.23 As shown in Table 4-3, monitored NO_2 concentrations did not exceed the applicable AQAL of 40 µg/m^3 in 2023 at the two closest monitoring locations to the Site.

4.24 Concentrations exceeded the annual mean AQAL at CAM315 in 2023, most likely due to its roadside location adjacent to the A40 High Holborn, within a street canyon. This is not considered representative of baseline conditions at the Site.

4.25 While it is noted that CAM316 is closest to the Site, again it is located at roadside along Drake Street / Procter Street, which is unlikely to directly influence air quality at the Site beyond contributions to background concentrations.

4.26 Data from CAM317, which is located on Red Lion Street, is considered broadly indicative of likely baseline conditions at the Site. It is considered representative of urban background conditions, which would reasonably be expected at the Site, as noted. Annual mean NO_2 concentrations at CAM317 did not exceed the AQAL in 2023. No comparison can be made against other AQALs, as they are not applicable in 2023.

4.27 It should be noted that CAM317 is in the same NGR grid square as the Site. Therefore, it is considered appropriate to compare monitoring data with UK-AIR background data, which are both available for 2023. The monitored data for CAM317 are 5.2 µg/m^3 below the UK-AIR modelled background concentration for the same year, as shown in Table 4-1.

Short-term AQALs

4.28 There is no evidence in the baseline review that NO_2 concentrations are likely to exceed the 1-hour mean AQAL, as annual mean concentrations are below 60µg/m^3.

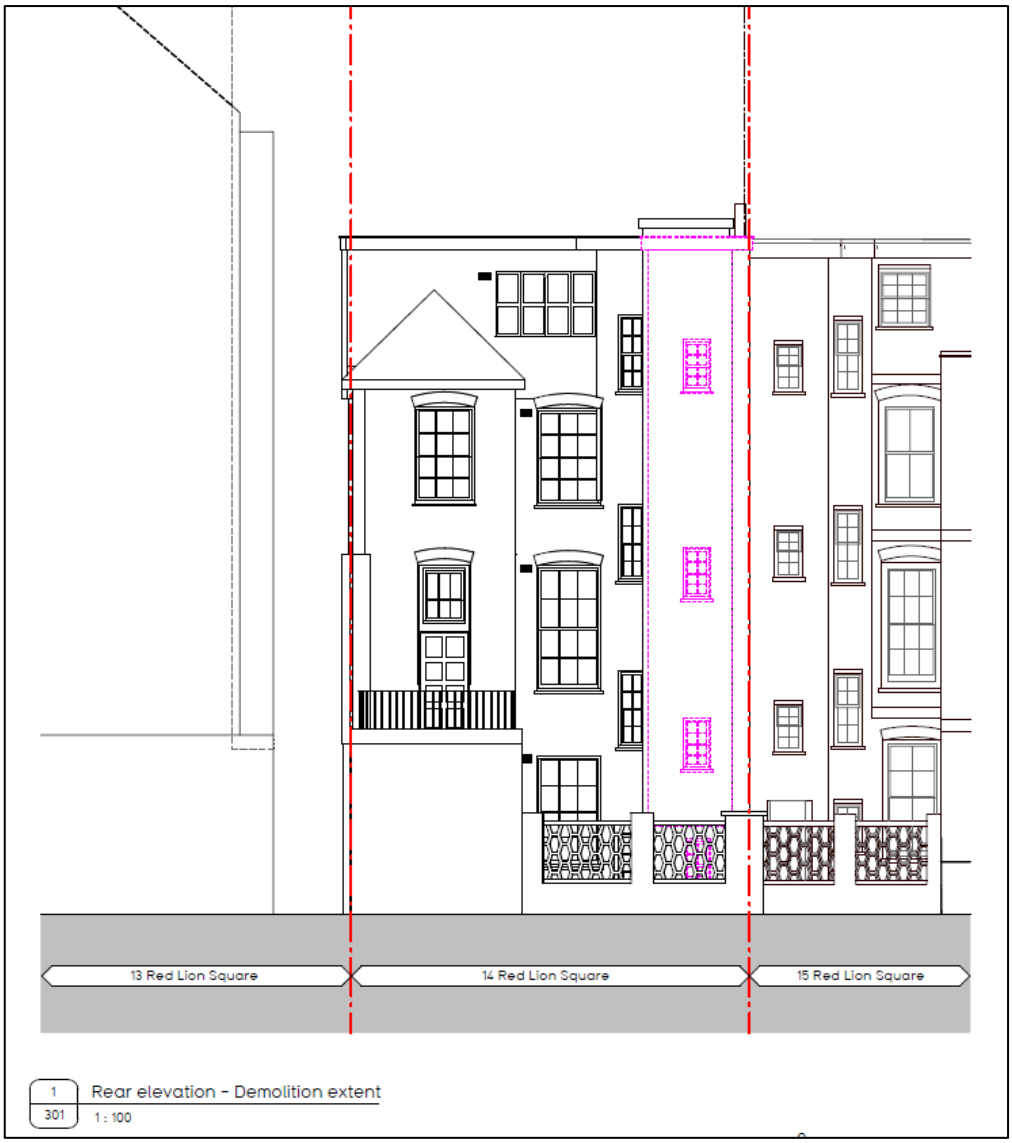
4.29 Based on predicted annual mean background PM_{10} concentrations the 24-hour AQAL is unlikely to be exceeded at the Site.

5 Predicted Impacts

Construction Phase

Scope of Works

5.1 The only external change is the replacement of the modern-built rear extension to accommodate a new lift. The scale of the extension is on a 'like for like' basis, the extent of which is shown in pink below:



Source: Drawing 301 Rear Elevation - Demolition extent

Figure 5-1: Demolition Extent

5.2 The Proposed Development does not exceed the property's existing footprint /massing. The lift shaft is proposed within the existing envelope of the existing rear brick extension.

5.3 Because a lift pit and a lift overrun needs to be installed, the existing brick extension will be carefully demolished, and bricks will be retained and re-used whenever possible. The brickwork and pointing of the new lift extension will be visually identical to the existing extension.

5.4 As all other construction phase works comprise internal refurbishment works to the existing building, there is no requirement to consider external earthworks or construction. Regarding trackout, again no further assessment has been undertaken, as no Heavy Duty Vehicles (HDV) are likely to be required to facilitate demolition, and there will be no unpaved road network associated with the works. However, proportionate mitigation measures for these works are presented in Appendix B.

Potential Dust Emission Magnitude during Demolition

5.5 Table 5-1 presents a summary of the potential dust emission magnitude for demolition works:

Table 5-1: Potential Dust Emission Magnitude

Workstage	Description of Works	Potential Dust Emission Magnitude
Demolition	Demolition works are expected to meet the following IAQM definitions: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months	Small

Sensitivity of the Area

5.6 The approximate number of human receptors sensitive to potential dust impacts during demolition has been estimated from a desk top study of the area up to 250m from Site. This is summarised in Table 5-2.

Table 5-2: Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate No. of Human Receptors (High Sensitivity)
<20	1-10
<50	10 – 100
<100	10 – 100
<250	>100

Dust Deposition

5.7 There are estimated to be 1-10 sensitive receptors located within 20m of the Site boundary. Therefore, the overall sensitivity of the surrounding area to nuisance dust soiling effects during demolition is defined as 'Medium', in accordance with IAQM guidance.

Human Health (PM_{10})

5.8 Background concentrations for PM_{10} are likely to be similar to background PM_{10} concentrations set out within UKAIR and LAEI background maps, as shown in Table 4-1 and Table 4-2 respectively.

5.9 Considering the assumed background PM_{10} concentrations and the number of sensitive receptors located within proximity of the Site, the sensitivity of the surrounding area to human health impacts is, therefore, considered to be 'Low'.

Summary of Area Sensitivity

5.10 The sensitivity of the receiving environment to specific potential dust impacts is shown in Table 5-3.

Table 5-3: Sensitivity of the Surrounding Area to Potential Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area
	Demolition
Dust Soiling	Medium
Human Health	Low

Summary of Potential Unmitigated Dust Risks

5.11 A summary of the risk from each dust generating activity is provided in Table 5-4. Overall, the Proposed Development is Low Risk for potential nuisance dust soiling effects, and Negligible Risk for PM_{10} health effects in the absence of mitigation.

Table 5-4: Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk
	Demolition
Dust Soiling	Low
Human Health	Negligible

Operation Phase

Road Traffic Emissions: Exposure / Site Sensitivity

5.12 Baseline AADT traffic flows for busy roads in the Site locale are in the range of 10,000 – 30,000 vehicles per day. At distances of more than 50m from a busy road, it is anticipated that NO_2 concentrations will have been diluted to the local urban background concentrations.

5.13 The Site is more than 50m from all identified primary pollution sources, and therefore it is reasonable to assume that baseline air quality conditions at the Site would be most comparable to background concentrations.

5.14 Local monitoring data from CAM317, which is located on Red Lion Street, is considered broadly indicative of likely baseline conditions at the Site. Annual mean

NO_2 concentrations at CAM317 did not exceed the applicable AQAL of 40 µg/m^3 in 2023. The monitored data for CAM317 are 5.2 µg/m^3 below the UK-AIR modelled background concentration for the same year and grid square.

5.15 However, both UK-AIR and LAEI modelled baseline concentrations for the Site show that:

- Annual mean baseline concentrations of NO_2 are modelled to be:
  - Above LBCC'S 2030 interim target in 2030, and
  - Above the WHO guideline, as adopted by LBCC, in 2034.
- Annual mean baseline concentrations of PM_{10} are modelled to be:
  - Above the WHO guideline, as adopted by LBCC, in 2030.
- Annual mean baseline concentrations of $PM_{2.5}$ are modelled to be:
  - Above the WHO guideline, as adopted by LBCC, in 2034.

5.16 As LBCC have adopted interim targets and WHO guideline values into their AQAP, mitigation is expected to be required to ensure that future occupiers of the Site are protected from the impacts of poor air quality in this context. Mitigation measures are discussed further in Section 6.

Air Quality Neutral

5.17 Air Quality Neutral calculations have been carried out following the methodology set out in the 'London Plan Guidance; Air Quality Neutral' 2023.

Building Emissions

5.18 The Air Quality Neutral guidance states that a development can be assumed to meet the Building Emissions Benchmarks (BEB) in any of the following instances:

- the new heating system is a heat pump or other zero-emission heat source;
- the new heating system includes one or more individual gas boilers with NO_x emissions rated at less than 40 mg/kWh;

- the development is connecting to an existing heat network.

5.19 The proposed heating system consists of radiators in casings under new windows wherever possible. Alternatively, existing locations will be re-used.

5.20 There will be a dedicated new plant area at basement level in the existing external storage room and in new storages spaces for the following:

- cold water plant room, with tank, pump and water softener.
- utility cupboard with boiler (further details are provided in Section 6), lighting control board & consumer unit.

5.21 On this basis, there should be no significant building emissions, and the Proposed Development can be assumed to achieve Air Quality Neutral requirements

Transport Emissions

5.22 The AQN guidance states that where a development is 'car-free', they can be assumed to meet the Transport Emissions Benchmarks (TEB).

5.23 Therefore, the Proposed Development can be considered to be achieve Air Quality Neutral requirements in terms of transport emissions.

6 Mitigation

Construction Phase

6.1 The IAQM's highly recommended mitigation measures for Low Risk sites are provided in Appendix B of this report. Implementing these measures is expected to effectively reduce the risk of impacts to Negligible during the construction phase.

Operation Phase

6.2 Detailed assessment of operational impacts has been screened out per LBCC guidance criteria, and on this basis potential impacts can be considered to be not significant.

6.3 The Site would reasonably be determined as suitable for residential development in terms of exposure to future levels of air pollution if comparison to AQALs adopted in relevant national legislation were to be made.

6.4 However, due to LBCC's adoption of bespoke interim targets and WHO guideline values in their AQAP, future levels of air quality may not meet these standards and therefore, as a precautionary approach, the Proposed Development will incorporate additional ventilation by using a mechanical ventilation system that includes a filtration system throughout the building, which is consistent with the findings of the previous Air Quality Statement.

6.5 Filtration is expected to provide protection against both NO_2 and $PM_{2.5}$. The location of ventilation inlets and opening windows should be located away from sources of air pollution at ground-level.

6.6 LBCC requires boilers to comply with an ultra-low NO_x emissions rating of less than 40 mg/kWh and an energy efficiency rating >90%.

6.7 The Proposed Development is concluded to be better than Air Quality Neutral in terms of both building (provided the boiler meets the criteria in Section 6.6 above) and transport emissions.

7 Discussion and Conclusions

Construction Phase

7.1 The qualitative construction dust risk assessment shows that the works would be Low Risk for adverse impacts during construction, in the absence of mitigation. By following the mitigation measures recommended in this report, the risk of significant construction phase impacts would reasonably be reduced to Negligible.

Operation Phase

7.2 As a precautionary approach, to protect against the impact of future poor air quality, the Proposed Development will incorporate additional ventilation by using a mechanical ventilation system that includes a filtration system. Filtration is expected provide protection against both NO_2 and $PM_{2.5}$.

Air Quality Neutral

7.3 The Proposed Development is considered to be better than Air Quality Neutral in terms of both building and transport emissions.

Overall

7.4 The residual effect of the Proposed Development on local air quality has been considered in the context of compliance with relevant planning policy as follows:

Table 7-1: Policy Compliance

Criteria	Evaluation	Comment
Do the proposals include new development that contributes to unacceptable levels of air pollution at other new development?	No	Positive outcome
Do the proposals include new development that is being put at unacceptable risk from unacceptable levels of air pollution?	No	Positive outcome
Do the proposals include new development that is adversely affected by unacceptable levels of air pollution?	**Yes**	**Mitigation Required**
Do the proposals contribute to unacceptable levels of air pollution at existing development	No	Positive outcome

Criteria	Evaluation	Comment
Do the proposals sustain and contribute towards compliance with relevant limit values or national objectives for pollutants?	Yes	Positive outcome
Have opportunities to improve air quality or mitigate impacts been identified?	Yes	Positive outcome
Are the proposals consistent with the local AQAP?	Yes	Positive outcome
Have air pollution risks been properly considered and adequate mitigation included to ensure there are no adverse impacts as a result of the development?	Yes	Positive outcome

7.5 On the basis that additional ventilation is installed, it is considered that the Proposed Development is acceptable on air quality grounds and therefore accords with Local Plan Policy CC4 and London Plan Policy SI1, and all other relevant air quality policy.

8 Appendices

Appendix A: Construction Phase Methodology

The GLA published a short practice note regarding the control of dust and emissions from construction and demolition. This note signposts to the IAQM guidance 'Assessment of Dust from Demolition and Construction' which should be followed when assessing and mitigating for the impact of dust and emissions from construction and demolition of developments in London. The IAQM methodology is outlined below:

Step 1

Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Should human receptors be identified within 250m of the boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment proceeds to Step 2.

Step 2a - Potential Dust Emission Magnitude

Step 2a determines the potential for dust to arise during the construction phase. Activities on construction sites with the potential to generate dust can be categorised into 4 types of activities:

- Demolition
    - any activities associated with the removal of existing structures on the Site;
- Earthworks
    - includes the processes of soil-stripping, ground-levelling, excavation and landscaping;
- Construction
    - any activities relating to the provision of new structures on the Site; and

- Trackout
    - the transport of dust and dirt from the Site onto the public road network where it may be deposited and re-suspended by vehicle traffic.

The potential dust emission magnitude for each of the activities is determined by the scale and magnitude of the works, and are classified as small, medium or large. As the only external works during construction of the Proposed Development are during demolition, only the demolition criteria are outlined below in Table 8-1.

Table 8-1: Construction Dust - Magnitude of Emission

Activity	Potential Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <12,000m^3, construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities <6m above ground, demolition during wetter months	Total building volume 12,000 m^3 – 75,000m^3, potentially dusty construction material, demolition activities 6-12m above ground level	Total building volume >75,000m^3, potentially dusty construction material (e.g., concrete), on Site crushing and screening, demolition activities >12m above ground level

Step 2b - Sensitivity of the Area to Construction Dust

Step 2B defines the sensitivity of the area around the development to potential dust impacts. The influencing factors to determine individual receptor sensitivities are shown in Table 8-2.

Table 8-2: Examples of Factors Defining Sensitivity of an Area

Receptor Sensitivity	Human Receptors
High	Users expect of high levels of amenity. High aesthetic or value property. People expected to be present continuously for extended periods of time. Locations where members of the public are exposed over a time period relevant to the AQAL for PM_{10}. e.g., residential properties, hospitals, schools, and residential care homes.

Receptor Sensitivity	Human Receptors
Medium	Users would expect to enjoy a reasonable level of amenity. Aesthetics or value of their property could be diminished by soiling. 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 e.g., parks and places of work.
Low	Enjoyment of amenity would not reasonably be expected. Property would not be expected to be diminished in appearance. Transient exposure, where people would only be expected to be present for limited periods. e.g., public footpaths, playing fields, shopping streets, farmland, short term car parks and roads.

The sensitivity of the area is defined separately for dust soiling impacts and human health impacts according to the criteria shown in the following tables, derived from IAQM guidance.

Table 8-3: Sensitivity of the Area to Dust Soiling

Receptor Sensitivity	No. of Receptors	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 8-4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration $\mu g/m^3$	No. of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32	>100	High	High	Medium	Medium
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24	>100	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration $\mu g/m^3$	No. of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	<1	Low	Low	Low	Low

Step 2c - Risk of Impacts

Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without mitigation (i.e., excluding embedded mitigation), according to the demolition matrix below.

Table 8-5: Dust Risk Category from Demolition Activities

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Low	Low	Negligible

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with Negligible risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final Step is to determine the significance of any residual impacts.

For almost all construction activity, the aim should be to control effects using effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be not significant.

Appendix B: Construction Dust Mitigation

IAQM guidance provides potential mitigation measures to reduce impacts because of fugitive dust emissions during the construction phase. These have been adapted for the Site as summarised in Table 8-6.

These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan or similar if required by the Local Authority.

Table 8-6: Fugitive Dust Emission Mitigation Measures

Issue / Control Measure	Site Risk
	Low
D = Desirable / H = Highly Recommended	
General	
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
Display the head or regional office contact information.	H
Develop and implement a 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 committed measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	D
Site Management	
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
Make the complaints log available to the Local Authority when asked.	H
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
Monitoring	
Undertake daily onsite 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

Issue / Control Measure	Site Risk Low
D = Desirable / H = Highly Recommended	
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and inspect log available to the Local Authority when asked.	H
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
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least 3 months before work commences on site.	H
Preparing And Maintaining the Site	
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H
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
Avoid site runoff of water or mud.	H
Keep site fencing, barriers and scaffolding clean using wet methods.	D
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
Cover, seed, or fence stockpiles to prevent wind whipping.	D
Operating Vehicle/Machinery and Sustainable Travel	
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London Non-Road Mobile Machinery standards, where applicable	H
Ensure all vehicles switch off engines when stationary - no idling vehicles.	H
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	H
Operations	
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

Issue / Control Measure	Site Risk Low
D = Desirable / H = Highly Recommended	
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H
Use enclosed chutes and conveyors and covered skips.	H
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
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
Waste Management	
Avoid bonfires and burning of waste materials.	H