



Air Quality Assessment: North Crescent, Camden

July 2021



Experts in air quality
management & assessment



Document Control

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Executive Summary

The air quality impacts associated with the proposed commercial redevelopment of Minerva House and Telephone Exchange in North Crescent in Camden have been assessed.

The proposed development will not generate a significant number of additional vehicle movements, and heat and hot water will be provided by air source heat pumps. The proposed development will not, therefore, generate any significant emissions during its operation.

During the construction works, a range of best practice mitigation measures will be implemented to reduce dust emissions and the overall effect will be 'not significant'; appropriate measures have been set out in this report, to be included in the Dust Management Plan for the works.

The proposed development has also been shown to meet the London Plan's requirement that new developments are at least 'air quality neutral'.

Overall, the construction and operational air quality effects of the proposed development are judged to be 'not significant'.

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1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed redevelopment of Minerva House and Telephone Exchange in North Crescent in Camden (hereafter referred to as the 'Site').
- 1.2 The proposed development is described as:
- “Refurbishment and reconfiguration of the existing buildings; including a one storey extension, plus plant, minor demolition works associated with internal and external alterations to provide additional office accommodation and associated works”.*
- 1.3 The proposed development lies within a borough-wide Air Quality Management Area (AQMA) declared by the London Borough of Camden (LBC) for exceedances of the annual mean nitrogen dioxide (NO₂) and 24-hour mean PM₁₀ objectives. It is also near two of the GLA's air quality Focus Areas; these are locations with high levels of human exposure where the EU annual mean limit value for nitrogen dioxide is exceeded. The proposed development will house offices which do not represent relevant exposure for the air quality objectives. However, it will generate additional traffic on local roads, which may impact on air quality at existing residential properties along the affected road network. The main air pollutants of concern related to road traffic emissions are nitrogen dioxide and fine particulate matter (PM₁₀ and PM_{2.5}).
- 1.4 The location and setting of the proposed development are shown in Figure 1, along with the nearby Focus Areas.

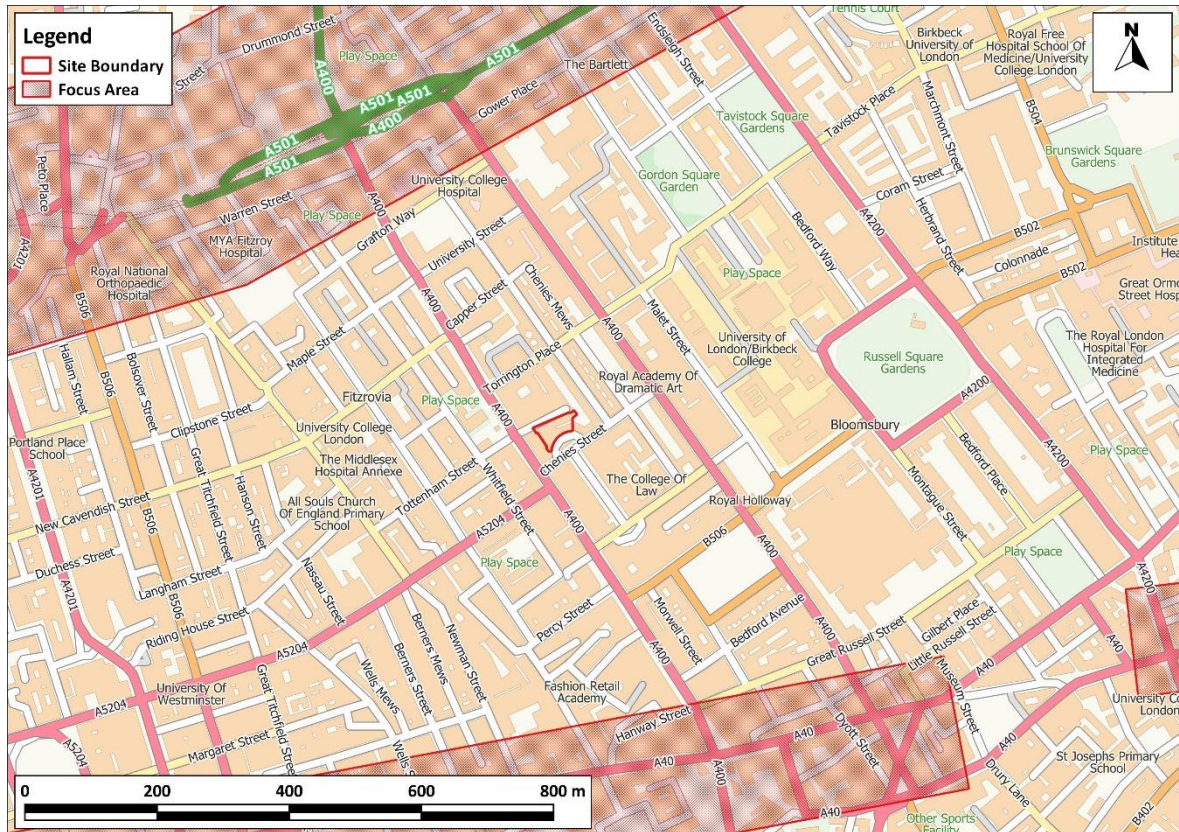


Figure 1: Proposed Development Setting in the Context of Air Quality

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- 1.5 The Greater London Authority’s (GLA’s) London Plan (GLA, 2021) requires new developments to be air quality neutral. The air quality neutrality of the proposed development has, therefore, been assessed following the methodology provided in the Greater London Authority’s (GLA’s) Supplementary Planning Guidance (SPG) on Sustainable Design and Construction (GLA, 2014a)¹.
- 1.6 The GLA has also released Supplementary Planning Guidance on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014b). The SPG outlines a risk assessment approach for construction dust assessment and helps determine the mitigation measures that will need to be applied. A construction dust assessment has been undertaken and the appropriate mitigation has been set out.

¹ The Sustainable Design and Construction SPG was revoked upon publication of the new London Plan, but the methodology within it that is relied upon in this report currently remains unchanged.

- 1.7 This report describes existing local air quality conditions (base year 2019), and considers air quality conditions at the proposed development in 2025, which is the anticipated year of opening. The assessment of construction dust impacts focuses on the anticipated duration of the works.
- 1.8 This report has been prepared taking into account all relevant local and national guidance and regulations and follows a methodology agreed with the London Borough of Camden.

2 Policy Context

- 2.1 All European legislation referred to in this report is written into UK law and remains in place, although there is uncertainty at this point in time as to who will enforce the requirements of some of this legislation.

Air Quality Strategy

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Clean Air Strategy 2019

- 2.3 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

- 2.4 The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

- 2.5 The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. The Government has since announced that the phase-out date for the sale of new petrol and diesel cars and vans will be brought forward to 2030 and that all new cars and vans must be fully zero emission at the tailpipe from 2035. If these ambitions are realised then road traffic-related NO_x emissions can be expected to reduce significantly over the coming decades.

Planning Policy

National Policies

- 2.6 The National Planning Policy Framework (NPPF) (2019a) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

“to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.

- 2.7 To prevent unacceptable risks from air pollution, Paragraph 170 of the NPPF states that:

“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 quality”.

- 2.8 Paragraph 180 states:

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

- 2.9 More specifically on air quality, Paragraph 181 makes clear that:

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

- 2.10 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019b), which includes guiding principles on how planning can take account of the impacts of new development on air quality. The PPG states that:

“Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified”.

- 2.11 Regarding plan-making, the PPG states:

“It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality”.

- 2.12 The role of the local authorities through the LAQM regime is covered, with the PPG stating that a local authority Air Quality Action Plan *“identifies measures that will be introduced in pursuit of the objectives and can have implications for planning”*. In addition, the PPG makes clear that *“Odour and dust can also be a planning concern, for example, because of the effect on local amenity”*.

- 2.13 Regarding the need for an air quality assessment, the PPG states that:

“Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity”.

- 2.14 The PPG sets out the information that may be required in an air quality assessment, making clear that:

“Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific”.

- 2.15 The PPG also provides guidance on options for mitigating air quality impacts, as well as examples of the types of measures to be considered. It makes clear that:

“Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented”.

London-Specific Policies

- 2.16 The key London-specific policies are summarised below, with more detail provided, where required, in Appendix A1.

The London Plan

- 2.17 The London Plan (GLA, 2021) sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The key policy relating to air quality is Policy SI1 on *Improving air quality*, Part B1 of which sets out three key requirements for developments:

“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*
- c) create unacceptable risk of high levels of exposure to poor air quality”.*

- 2.18 The Policy then details how developments should meet these requirements, stating:

“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*
- 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”.*

- 2.19 Part C of the Policy introduces the concept of Air Quality Positive for large-scale development, stating:

“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:

- 1) how proposals have considered ways to maximise benefits to local air quality, and*
- 2) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.”*

2.20 The proposed development is not large-scale development, thus an Air Quality Positive statement is not required.

2.21 Regarding construction and demolition impacts, Part D of Policy SI1 of the London Plan states:

“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”.

2.22 Part E of Policy SI1 states the following regarding mitigation and offsetting of emissions:

“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”.

2.23 The explanatory text around Policy SI1 of the London Plan states the following with regard to assessment criteria:

“The Mayor is committed to making air quality in London the best of any major world city, which means not only achieving compliance with legal limits for Nitrogen Dioxide as soon as possible and maintaining compliance where it is already achieved, but also achieving World Health Organisation targets for other pollutants such as Particulate Matter.

The aim of this policy is to ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. Where limit values are already met, or are predicted to be met at the time of completion, new developments must endeavour to maintain the best ambient air quality compatible with sustainable development principles.

Where this policy refers to ‘existing poor air quality’ this should be taken to include areas where legal limits for any pollutant, or World Health Organisation targets for Particulate Matter, are already exceeded and areas where current pollution levels are within 5 per cent of these limits”.

- 2.24 The London Plan includes a number of other relevant policies, which are detailed in Appendix A1.

London Environment Strategy

- 2.25 The London Environment Strategy was published in May 2018 (GLA, 2018a). The strategy considers air quality in Chapter 4; the Mayor’s main objective is to create a “*zero emission London by 2050*”. Policy 4.2.1 aims to “*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*”. The strategy sets out the aim of achieving the World Health Organisation guideline for PM_{2.5} London-wide by 2030. An implementation plan for the strategy has also been published which sets out what the Mayor will do between 2018 and 2023 to help achieve the ambitions in the strategy.

Mayor’s Transport Strategy

- 2.26 The Mayor’s Transport Strategy (GLA, 2018b) sets out the Mayor’s policies and proposals to reshape transport in London over the next two decades. The Strategy focuses on reducing car dependency and increasing active sustainable travel, with the aim of improving air quality and creating healthier streets. It notes that development proposals should “*be designed so that walking and cycling are the most appealing choices for getting around locally*”.

GLA SPG: Sustainable Design and Construction

- 2.27 The GLA’s SPG on Sustainable Design and Construction (GLA, 2014a) was revoked upon publication of the new London Plan, but it is understood that GLA still expects the emission standards set within it for gas-fired boilers, Combined Heat and Power (CHP) and biomass plant to be met. It is also currently the only published document that sets out guidance on how an ‘air quality neutral’ assessment should be undertaken.

GLA SPG: The Control of Dust and Emissions During Construction and Demolition

- 2.28 The GLA’s SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014b) outlines a risk assessment based approach to considering the potential for dust generation from a construction site, and sets out what mitigation measures should be implemented to minimise the risk of construction dust impacts, dependent on the outcomes of the risk assessment. This guidance is largely based on the Institute of Air Quality Management’s (IAQM’s²) guidance (IAQM, 2016), and it states that “*the latest version of the IAQM Guidance should be used*”.

² The IAQM is the professional body for air quality practitioners in the UK.

Air Quality Focus Areas

2.29 The GLA has identified 187 air quality Focus Areas in London. These are locations that not only exceed the annual mean limit value for nitrogen dioxide, but also have high levels of human exposure. They do not represent an exhaustive list of London's air quality hotspot locations, but locations where the GLA believes the problem to be most acute. They are also areas where the GLA considers there to be the most potential for air quality improvements and are, therefore, where the GLA and Transport for London (TfL) will focus actions to improve air quality. The proposed development is located approximately 400 m to the south of the Marylebone Road from Marble Arch/Euston/King's Cross Junction air quality Focus Area and a similar distance to the north of the Oxford Street from Marble Arch to Bloomsbury air quality Focus Area.

Local Transport Plan

2.30 LBC's Transport Strategy (London Borough of Camden, 2019a) sets out the Council's vision and objectives for transport in the borough, in order to respond to changing challenges, opportunities and policy contexts, and identifies measures by which the Council will meet its transport goals. The Strategy contains one relevant objective on air quality; Objective 5 '*To reduce and mitigate the impact of transport-based emissions...*'. The Objective is supported by the following policies:

"Policy 5b: Work towards the World Health Organisation (WHO) limits for Particulate Matter and Nitrogen Dioxide by 2030.

Policy 5c: Use air quality indicators (PM₁₀ and NO_x emissions levels) as key factors in prioritising locations for LIP-funding through our Area-wide Healthy Streets Projects.

Policy 5h: Where feasible and appropriate, we will monitor the impact of our highways/streetscape schemes using air quality monitoring, including (for example) the use of diffusion tubes to monitor Nitrogen Dioxide levels pre- and post-implementation."

2.31 Other actions within the supporting policies include:

- Continuing to develop a comprehensive network of electric vehicle charging points;
- Incentivising the update of electric vehicles; and
- Establishing the highest standards for the Council's own vehicle fleet.

Local Policies

2.32 The Camden Council Local Plan (London Borough of Camden, 2017) was adopted in 2017. The Plan sets out the Council's planning policies, covering the period from 2016-2031, and replaces the Core Strategy and Development Policies planning documents (adopted in 2010).

- 2.33 Policy A1 on managing the impact of development states that *“The Council will seek to protect the quality of life of occupiers and neighbours”* and will *“seek to ensure that the amenity of communities, occupiers and neighbours is protected [...] and require mitigation measures where necessary”*. Factors that will be considered include odour, fumes and dust.
- 2.34 Policy CC4 on Air Quality states that:
- “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.*
- Air Quality Assessments (AQA) 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 permissions 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 emission impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.”*
- 2.35 LBC published a ‘Camden Planning Guidance’ Supplementary Planning Document (SPD) (London Borough of Camden, 2019b) in March 2019, specifically pertaining to air quality. It provides information on air quality in the borough and supports Local Plan Policy CC4 Air Quality. It also contains advice on air quality modelling methodology, including assuming no improvement in air quality in future year scenarios, and recommending the use of 38 µg/m³ as the assessment level for annual mean nitrogen dioxide.
- 2.36 The draft ‘Camden Planning Guidance’ document on Air Quality is currently published for consultation purposes (London Borough of Camden, 2020a). If approved, it will replace the adopted Camden Planning Guidance on Air Quality.

Building Standards

- 2.37 Part F of the Building Regulations (Ministry of Housing, Communities & Local Government, 2020) sets legal requirements related to ventilation for buildings. It identifies performance criteria for ventilation systems for dwellings and offices, stating that nitrogen dioxide concentrations of 288 µg/m³ as a 1-hour average and 40 µg/m³ as a long-term average should not be exceeded. While these are building control requirements rather than planning requirements, they highlight that where ambient (outdoor) air exceeds the annual mean nitrogen dioxide objective, it is expected that an

appropriate ventilation system will be installed to ensure that indoor concentrations are below the performance criterion.

Air Quality Action Plans

National Air Quality Plan

- 2.38 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. Alongside a package of national measures, the 2017 Plan and the 2018 Supplement require those identified English Local Authorities (or the GLA in the case of London Authorities) to produce local action plans and/or feasibility studies. These plans and feasibility studies must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a CAZ. There is currently no straightforward way to take account of the effects of the 2017 Plan or 2018 Supplement in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

- 2.39 LBC's Clean Air Action Plan (London Borough of Camden, 2019c) sets out a series of measures by which the Council will seek to achieve the air quality objectives in the borough. The Plan sets out seven key priorities around which a number of actions have been developed in order to improve local air quality. The priorities most relevant to the proposed development are:
- *“building emissions – enforcing Air Quality Neutral and Air Quality Positive policies for new developments; and*
 - *construction emissions – ensuring all major sites have a demolition management plan (DMP) and a construction management plan (CMP), also ensuring all medium and high-risk sites have real time PM monitoring on site”.*

3 Assessment Criteria

- 3.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 3.2 The UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The PM_{2.5} objective was to be achieved by 2020.
- 3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2021a). The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.4 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010). The limit values for nitrogen dioxide are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).
- 3.5 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5} ^a	Annual Mean	25 µg/m ³

^a The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

World Health Organisation Guideline for Annual Mean PM_{2.5}

3.6 The WHO has set a guideline for annual mean PM_{2.5} of 10 µg/m³. The guideline is not currently in UK regulations and there is no explicit requirement to assess against it. However, achievement of the guideline is a long-term aspiration of the UK Government (Defra, 2019) and, as set out in Paragraph 2.25, the GLA aims to achieve it by 2030. As such, consideration has been included within this assessment.

Construction Dust Criteria

3.7 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the IAQM (2016) has been used (the GLA's SPG (GLA, 2014b) recommends that the assessment be based on the latest version of the IAQM guidance). Full details of this approach are provided in Appendix A2.

Screening Criteria for Road Traffic Assessments

3.8 Environmental Protection UK (EPUK) and the IAQM recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in Appendix A3, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

3.9 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix A3) inside an AQMA are a change in flows of more than 25 heavy duty vehicles or 100 light duty vehicles per day. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that *"the criteria provided are precautionary and should be treated as indicative"*, and *"it may be appropriate to amend them on the basis of professional judgement"*.

4 Assessment Approach

Consultation

- 4.1 The assessment follows a methodology agreed with the London Borough of Camden via email correspondence between Tom Parkes (Air Quality Officer at Camden Council) and Tomas Liska (Air Quality Consultants) on 8th January 2021.

Existing Conditions

- 4.2 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

- industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2021c);
- local sources have been identified through examination of the Council's Air Quality Review and Assessment reports;
- information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority;
- background concentrations have been defined using Defra's 2018-based background maps (Defra, 2021b). These cover the whole of the UK on a 1x1 km grid. The background annual mean nitrogen oxides and nitrogen dioxide maps for 2019 have been calibrated against concurrent measurements from Inner London monitoring sites (AQC, 2020). The calibration factor calculated has also been applied to future year backgrounds. Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted; and
- whether or not there are any exceedances of the annual mean limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2020) (2021d), as well as from any nearby Automatic Urban and Rural Network (AURN) monitoring sites (which operate to the required data quality standards). These are the maps used by the UK Government, together with the AURN results, to identify and report exceedances of the limit value. The national maps of roadside PM₁₀ and PM_{2.5} concentrations (Defra, 2021d), which are available for the years 2009 to 2019, show no exceedances of the limit values anywhere in the UK in 2019.

Construction Impacts

- 4.3 The construction dust assessment considers the potential for impacts within 350 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014b), which is based on that provided by IAQM (2016). This follows a sequence of steps.

Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. Appendix A2 explains the approach in more detail.

Road Traffic Impacts

Impacts at Existing Receptors

- 4.4 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.8 and detailed further in Appendix A3. Where impacts can be screened out there is no need to progress to a more detailed assessment.

Impacts of Existing Sources on the Proposed Development

- 4.5 The proposed development will house offices which do not represent relevant exposure for the air quality objectives, however, in order to consider compliance with Part F of the Building Regulations, air quality conditions within the site have been assessed qualitatively, taking account of local air quality monitoring data and proximity to the local road network.
- 4.6 The assessment examines air quality in 2019³, and assumes these conditions are representative of air quality conditions at the time the development is occupied in 2025. This assumption is considered to be worst-case, as it is generally expected that pollutant concentrations will decline in future years.

Assessment of Significance

Construction Dust Significance

- 4.7 Guidance from IAQM (2016) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version of the guidance upon which the assessment methodology set out in the GLA guidance (GLA, 2014b) is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used). The assessment thus focuses on

³ In early 2020, activity in the UK was disrupted by the Covid-19 pandemic and concentrations of traffic-related air pollutants fell appreciably (Defra Air Quality Expert Group, 2020). While the pandemic may cause long-term changes to travel activity patterns, it is reasonable to expect a return to more typical activity levels in the future. As 2019 data were collected prior to the pandemic, it is judged appropriate to use these data to provide a worst-case assessment.

determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

Operational Significance

- 4.8 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The approach developed jointly by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) has therefore been used. The overall significance of the air quality impacts is determined using professional judgement; the experience of the consultants preparing the report is set out in Appendix A4. Full details of the EPUK/IAQM approach are provided in Appendix A3.

'Air Quality Neutral'

- 4.9 The guidance relating to air quality neutral follows a tiered approach, such that all developments are expected to comply with minimum standards for gas and biomass boilers and for CHP plant (GLA, 2014a). Compliance with 'air quality neutral' is then founded on emissions benchmarks that have been derived for both building (energy) use and road transport in different areas of London. Developments that exceed the benchmarks are required to implement on-site or off-site mitigation to offset the excess emissions (GLA, 2014a).
- 4.10 Appendix A5 sets out the emissions benchmarks. The approach has been to calculate the emissions from the development and to compare them with these benchmarks. It should be noted that the current air quality neutral benchmarks are based around the planning use classes that existed prior to September 2020, having not yet been updated to reflect the amended use classes. New guidance on Air Quality Neutral is expected shortly and will include the updated benchmarks.

5 Baseline Conditions

Relevant Features

- 5.1 The proposed development site is bounded by Alfred Mews to the northwest and North Crescent to the southeast. It currently consists of two buildings – Minerva House and Telephone Exchange.
- 5.2 The proposed development is located within a borough-wide AQMA and close to two air quality Focus Areas, as highlighted in Figure 1.

Industrial sources

- 5.3 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local Air Quality Monitoring

- 5.4 LBC operates three automatic monitoring stations within its area, two of which are located within approximately 1 km of the proposed development; namely, the roadside site at Euston Road (CD9) and the urban background site at London Bloomsbury (BL0). The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko (using the 50% TEA in acetone method). These include:
- one on Tottenham Court Road (CA11), 100 m southwest of the Site;
 - one on Bloomsbury Street (CA21), 450 m southeast of the Site;
 - one in Tavistock Square Gardens (CA10), 500 m northeast of the Site; and
 - one on Endsleigh Gardens (CA29), 570 m northeast of the Site.
- 5.5 In addition, the Oxford Street East and Cavendish Square automatic monitoring station operated by Westminster City Council are located approximately 570 m to the southwest and 900 m to the west of the Site, respectively.
- 5.6 Annual mean results for the years 2014 to 2019 are summarised in Table 2, while results relating to the 1-hour mean objective are summarised in Table 3. Exceedances of the objectives are shown in bold. The monitoring locations are shown in Figure 2. The monitoring data have been taken from LBC's and Westminster City Council's 2020 Annual Status Reports (London Borough of Camden, 2020b; Westminster City Council, 2020).

Table 2: Summary of Annual Mean NO₂ Monitoring (2014-2019) (µg/m³)

Site	Site Type	Location	2014	2015	2016	2017	2018	2019
BL0	Urban Background	Bloomsbury Square	45.0	48.0	42.0	38.0	36.0	32.0
CD9	Roadside	Euston Road	98.0	90.0	88.0	83.0	82.0	70.0
Oxford Street East	Roadside	Oxford Street East	-	-	-	-	76.0	51.0
Cavendish Square	Roadside	Cavendish Square	-	-	-	-	64.0	50.0
CA4	Roadside	Euston Road	89.7	86.8	82.7	92.5	69.2	69.1^a
CA6	Urban Background	Wakefield Gardens	36.4	35.8	31.3	34.8	26.7	24.7
CA10	Urban Background	Tavistock Square Gardens	46.5	44.6	39.7	46.2	35.4	33.1
CA11^b	Kerbside	Tottenham Court Road	86.8	85.6	83.6	74.0	65.8	61.2
CA21	Kerbside	Bloomsbury Street	80.8	71.4	72.2	71.2	59.4	48.5
CA28	Urban Background	St George's Gardens East	-	-	-	-	-	27.7
CA29	Roadside	Endsleigh Gardens	-	-	-	-	-	48.3
Objective			40					

^a Data for monitor CA4A (new) in the 2020 ASR report.

^b Monitor CA11 was moved 5 m to the north but at the same distance from the kerb (at a slightly lower height) in November 2019 due to major roadworks.

Table 3: Number of Hours With NO₂ Concentrations Above 200 µg/m³

Site	Site Type	Location	2014	2015	2016	2017	2018	2019
BL0	Urban Background	Bloomsbury Square	0	0	0	0	0	0
CD9	Roadside	Euston Road	221	54	39	25	18	7
Oxford Street East	Roadside	Oxford Street East	-	-	-	-	11	5
Cavendish Square	Roadside	Cavendish Square	-	-	-	-	0	0
Objective			18					

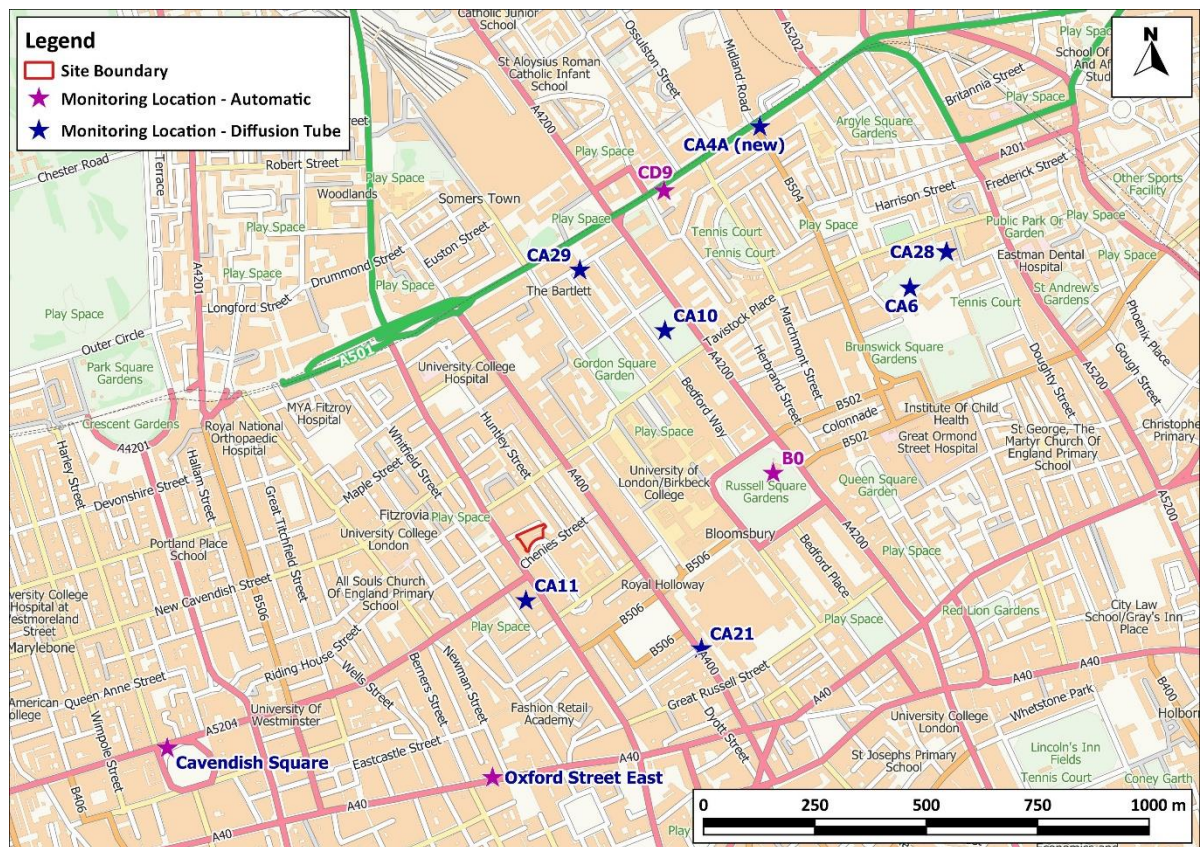


Figure 2: Monitoring Locations

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5.7 As shown in Table 2, continued exceedances of the annual mean nitrogen dioxide objective have been measured at roadside and kerbside sites (CD9, Oxford Street East, Cavendish Square, CA4, CA11, CA21 and CA29) over the past six years. However, none of these sites are representative of

conditions at the Site, which is located further from a major road than any of the roadside and kerbside monitoring sites. Concentrations at the Site will most likely be closer to those measured at the background monitoring sites (BL0, CA6, CA10 and CA28), thus below the objective.

5.8 Table 3 shows the 1-hour mean objective for nitrogen dioxide was exceeded at the Euston Road (CD9) automatic site until 2017, but there have been no exceedances at any the two considered sites since. It can thus be expected that the 1-hour mean nitrogen dioxide objective is not currently exceeded in the study area.

5.9 The BL0, CD9, Oxford Street East and Cavendish Square automatic monitoring stations also measure PM₁₀ concentrations; BL0 and CD9 additionally measure PM_{2.5} concentrations. Annual mean results for the years 2014 to 2019 are summarised in Table 4, and results relating to the daily mean objective are summarised in Table 5. All measured concentrations have been below the relevant objectives.

Table 4: Summary of Annual Mean PM₁₀ and PM_{2.5} Monitoring (2014-2019) (µg/m³)

Site	Site Type	Location	2014	2015	2016	2017	2018	2019
PM₁₀								
BL0	Urban Background	Bloomsbury Square	20	22	20	19	17	18
CD9	Roadside	Euston Road	29	18	24	20	21	22
Oxford Street East	Roadside	Oxford Street East	-	-	-	-	28 ^a	24 ^a
Cavendish Square	Roadside	Cavendish Square	-	-	-	-	28 ^a	25
Objective			40					
PM_{2.5}								
BL0	Urban Background	Bloomsbury Square	-	11	12	13	10	11
CD9	Roadside	Euston Road	-	17	17	14	15	14
Objective			25/10^b					

^a Annualised data

^b The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m³ is the WHO guideline for annual mean PM_{2.5}; there is no requirement for local authorities to meet this.

Table 5: Number of Days With PM₁₀ Concentrations Above 50 µg/m³

Site	Site Type	Location	2014	2015	2016	2017	2018	2019
BL0	Urban Background	Bloomsbury Square	11	6	9	6	1	9
CD9	Roadside	Euston Road	5	5	10	3	2	8
Objective			35					

Exceedances of Limit Value

- 5.10 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean nitrogen dioxide limit value (Defra, 2021e). Furthermore, Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2021d), which are used to identify and report exceedances of the limit value, identify exceedances of this limit value in 2019 along many roads in London, including the A400 and A5204 near to the proposed development. The Greater London Urban Area has thus been reported as exceeding the limit value for annual mean nitrogen dioxide concentrations. Defra's predicted concentrations for 2025 (Defra, 2020) do not identify any exceedances within 500 m of the application site. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.
- 5.11 Defra's Air Quality Plan requires the GLA to prepare an action plan that will "*deliver compliance in the shortest time possible*", and the 2015 Plan assumed that a CAZ was required. The GLA has already implemented an LEZ and a ULEZ, thus the authority has effectively already implemented the required CAZ. These have been implemented as part of a package of measures including 12 Low Emission Bus Zones, Low Emission Neighbourhoods, the phasing out of diesel buses and taxis and other measures within the Mayor's Transport Strategy.

6 Construction Phase Impact Assessment

Construction Traffic

- 6.1 The screening criteria relevant to the study area are 25 AADT for heavy vehicles and 100 AADT for light vehicles, as recommended by EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017). The construction works will generate a maximum of two light vehicles (as an AADT) in 2024 and seven heavy vehicle (AADT) in 2023. This is well below the relevant screening criteria. It is, therefore, not considered necessary to assess the impacts of traffic emissions during the construction phase; it can be concluded that construction of the proposed development will not have a significant impact on local roadside air quality.

On-Site Exhaust Emissions

- 6.2 The IAQM guidance (IAQM, 2016) states:

“Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed”.

- 6.3 Any NRMM operated on site will comply with the Stage IV emission limit set out in European Union Directive 97/68/EC (The European Parliament and the Council of the European Union, 1997) and its subsequent amendments.
- 6.4 Based on the above, effects associated with NRMM emissions are screened out as being not significant.

Construction Dust and Particulate Matter Emissions

- 6.5 The construction works will give rise to a risk of dust impacts during demolition, earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a detailed assessment. There are receptors within the distances set out in the guidance (see Appendix A2), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition

- 6.6 There will be a requirement to demolish parts of the existing buildings, with works anticipated to take around three months. The total demolition volume is estimated to be less than 20,000 m³. Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for demolition is considered to be *small*.

Earthworks

- 6.7 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website (British Geological Survey, 2021), as set out in Table 6. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table 6: Summary of Soil Characteristics

Category	Record
Soil Layer Thickness	Deep
Soil Parent Material Grain Size	Mixed (Arenaceous ^a – Rudaceous ^b)
European Soil Bureau Description	River Terrace Sand/Gravel
Soil Group	Light (Sandy) to Medium (Sandy)
Soil Texture	Sand to Sandy Loam ^c

^a grain size 0.06 – 2.0 mm.

^b grain size > 2.0 mm.

^c a loam is composed mostly of sand and silt.

- 6.8 The site covers approximately 2,000 m² and most of this will be subject to earthworks, involving excavation to accommodate the lower ground floor and basement of the proposed development. The earthworks will last around two months and dust will arise mainly from vehicles travelling over unpaved ground and from the handling of dusty materials (such as dry soil). Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for earthworks is considered to be *small*.

Construction

- 6.9 Construction will involve a one storey extension and internal and external alterations to the existing buildings, with a total building volume estimated to be less than 25,000 m³. Dust will arise the handling and storage of dusty materials, and from the cutting of concrete. The construction will take place over an 18-month period. Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for construction is considered to be *small*.

Trackout

- 6.10 The maximum number of heavy vehicles accessing the site, which may track out dust and dirt, is anticipated not to exceed 29 per day. Based on the example definitions set out in Table A2.1 in Appendix A2, the dust emission class for trackout is considered to be *medium*.
- 6.11 Table 7 summarises the dust emission magnitude for the proposed development.

Table 7: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Medium

Sensitivity of the Area

- 6.12 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as baseline PM₁₀ concentrations.
- 6.13 The IAQM guidance, upon which the GLA's guidance is based, explains that residential properties are 'high' sensitivity receptors to dust soiling while places of work are of a 'medium' sensitivity (Table A2.2 in Appendix A2). Residential properties are also classified as being of 'high' sensitivity to human health effects, while places of work are classified as being of 'medium' sensitivity. The guidance also states that a school is to be treated as having >100 receptors. There are approximately 90 residential properties and the Royal Academy of Dramatic Art within 50 m of the site (see Figure 3).

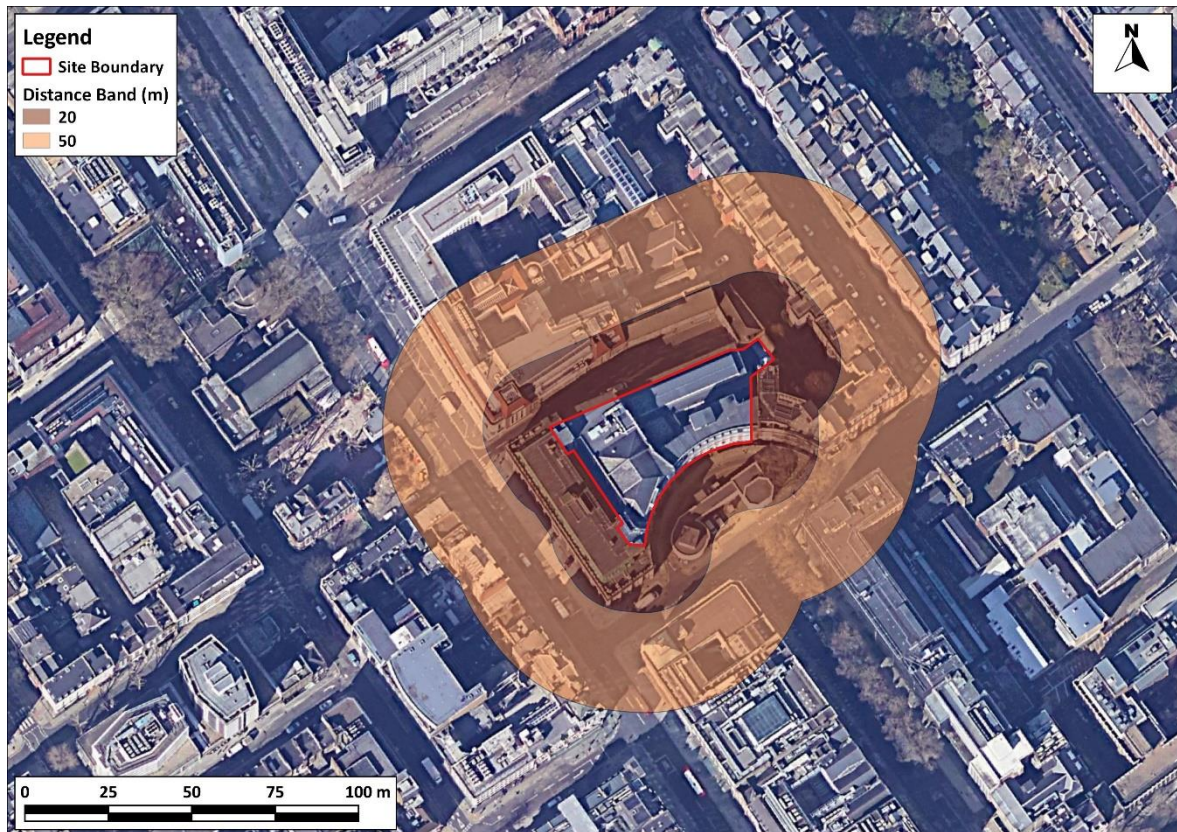


Figure 3: 20 m and 50 m Distance Bands around Site Boundary

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- 6.14 Table 7 shows that the dust emission magnitude for trackout is *medium* and Table A2.3 in Appendix A2 thus explains that there is a risk of material being tracked 200 m from the site exit. There are several dozen residential properties, the Royal Academy of Dramatic Art and UCL's Faculty of Engineering within 20 m of the roads along which material could be tracked (see Figure 4).

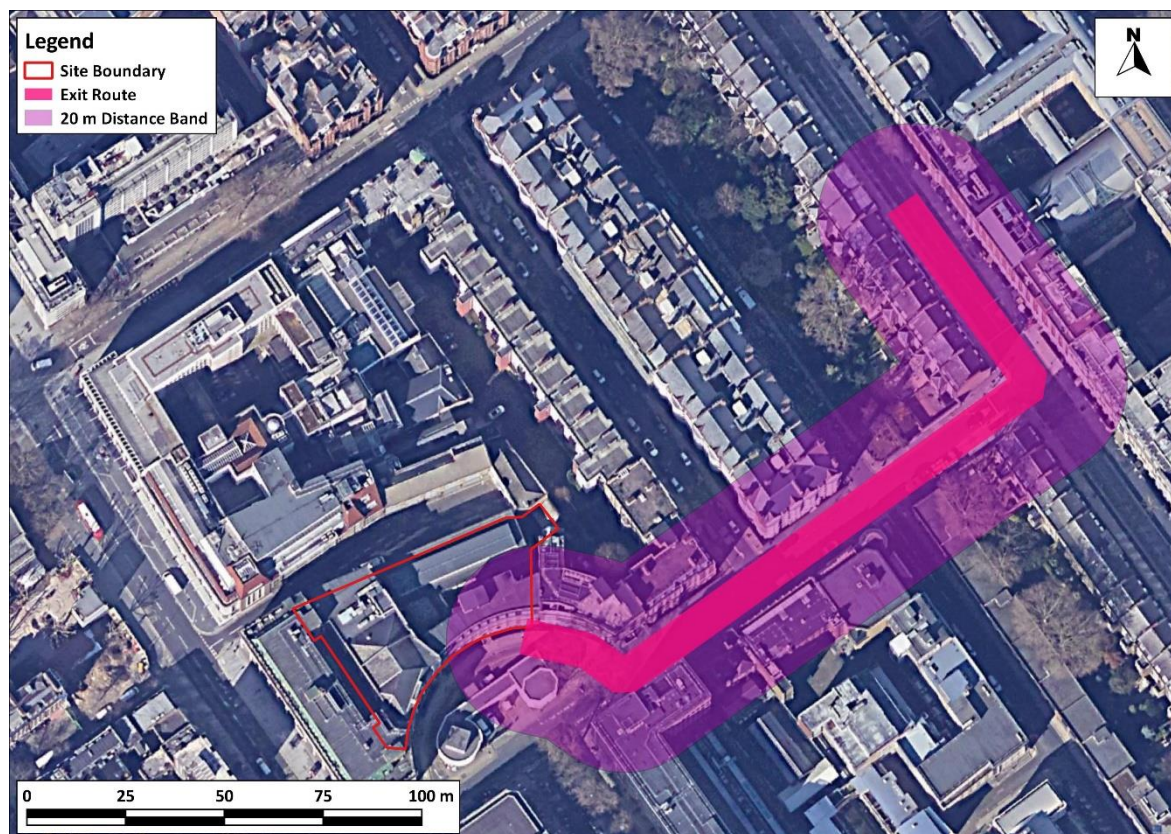


Figure 4: 20 m Distance Band around Roads Used by Construction Traffic Within 200 m of the Site Exit

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Sensitivity of the Area to Effects from Dust Soiling

- 6.15 Using the information set out in Paragraph 6.13 and Figure 3 alongside the matrix set out in Table A2.3 in Appendix A2, the area surrounding the onsite works is of 'high' sensitivity to dust soiling. Using the information set out in Paragraph 6.14 and Figure 4 alongside the same matrix, the area is also of 'high' sensitivity to dust soiling due to trackout.

Sensitivity of the Area to any Human Health Effects

- 6.16 The matrix in Table A2.4 in Appendix A2 requires information on the baseline annual mean PM₁₀ concentration in the area. Owing to the lower traffic flows in the vicinity of the proposed development, the baseline annual mean PM₁₀ concentration at the site is expected to be lower than the 22 µg/m³ measured by the roadside site CD9 in 2019 (see Table 4). Using the information set out in Paragraphs 6.13 and Figure 3 alongside the matrix in Table A2.4 in Appendix A2, the area surrounding the onsite works is of 'low' sensitivity to human health effects. Using the information set out in Paragraph 6.14 and Figure 4 alongside the same matrix, the area surrounding roads along which material may be tracked from the site is of 'medium' sensitivity to human health effects.

Sensitivity of the Area to any Ecological Effects

- 6.17 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary or those roads along which material may be tracked, thus ecological impacts will not be considered further.

Summary of the Area Sensitivity

- 6.18 Table 8 summarises the sensitivity of the area around the proposed construction works.

Table 8: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	Trackout
Dust Soiling	High Sensitivity	High Sensitivity
Human Health	Low Sensitivity	Medium Sensitivity

Risk and Significance

- 6.19 The dust emission magnitudes in Table 7 have been combined with the sensitivities of the area in Table 8 using the matrix in Table A2.6 in Appendix A2, in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 9. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 9 (step 3 of the assessment procedure).

Table 9: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health
Demolition	Medium Risk	Negligible
Earthworks	Low Risk	Negligible
Construction	Low Risk	Negligible
Trackout	Medium Risk	Low Risk

- 6.20 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant' (IAQM, 2016).

7 Operational Phase Impact Assessment

Impacts at Existing Receptors

- 7.1 The proposed development is expected to generate an additional three daily light vehicle trips on local roads; this is well below the screening threshold of 100 light duty vehicles (LDVs) recommended for use within an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Paragraph 3.9). The proposed development will not generate any additional heavy duty vehicle (HDV) trips. The relevant screening thresholds will not be exceeded and there is no requirement for a detailed assessment of road traffic impacts at existing receptors; it can be concluded that the proposed development will not have a significant impact on local roadside air quality.

Impacts of Existing Sources on Future Occupants of the Development

- 7.2 The proposed development consists of office space which does not represent relevant exposure for any objective therefore the impact of existing sources on future occupants of the proposed development is not assessed. Nevertheless, monitoring data from the BL0 monitoring site which is judged to be the most representative of the conditions at the proposed development indicate that air quality conditions at and near the site are likely to be good, with pollutant concentrations below the relevant air quality objectives. It can thus be concluded that the performance criteria for ventilation systems set in Part F of the Building Regulations will be met, with the 1-hour and annual mean nitrogen dioxide concentrations in the air supplied to the building (either mechanically or through openable windows) not exceeding the values quoted in paragraph 2.37.

Significance of Operational Air Quality Effects

- 7.3 The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in Appendix A3, and takes account of the assessment that the trip generation of the proposed development will be below the published EPUK/IAQM screening criteria, and thus the effect of vehicle emissions can be screened as 'not significant'.

8 'Air Quality Neutral'

- 8.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant impacts on human health (this has been assessed separately in the previous section).

Building Emissions

- 8.2 The proposed development does not include any combustion plant for the routine or emergency provision of electricity, heating or hot water and will thus have no direct building emissions. It is, therefore, better than air quality neutral in terms of building emissions.

Road Transport Emissions

- 8.3 The proposed development does not provide any car parking and is 'car-free'. As such, by default, the proposed development is considered to be air quality neutral in terms of road transport emissions.

Summary

- 8.4 The proposed development complies with the requirement that all new developments in London should be at least air quality neutral.

9 Mitigation

Good Design and Best Practice

9.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required. The proposed development incorporates the following good design and best practice measures:

- adoption of a Dust Management Plan (DMP) to minimise the environmental impacts of the construction works;
- car-free development, with no car parking spaces, to discourage the use of private vehicles to access the proposed development;
- provision of 140 long stay and 14 visitor's cycle parking spaces; and
- heating and hot water provided by air source heat pumps to avoid the need for on-site combustion.

Recommended Mitigation

Construction Impacts

9.2 Measures to mitigate dust emissions will be required during the construction phase of the development in order to minimise effects upon nearby sensitive receptors.

9.3 The site has been identified as a *Low Risk* site during earthworks and construction, and *Medium Risk* for demolition and trackout, as set out in Table 9. The GLA's SPG on *The Control of Dust and Emissions During Construction and Demolition* (GLA, 2014b) describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on what monitoring should be undertaken during the construction phase. This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A6.

9.4 The mitigation measures should be written into a DMP. The DMP may be integrated into a Code of Construction Practice or the Construction Environmental Management Plan, and may require monitoring. The GLA's guidance suggests that, for a Medium Risk site, automatic monitoring of particulate matter (as PM₁₀) will be required. It also states that, on certain sites, it may be appropriate to determine the existing (baseline) pollution levels before work begins. However, the guidance is clear that the Local Authority should advise as to the appropriate air quality monitoring procedure and timescale on a case-by-case basis.

- 9.5 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.

Road Traffic Impacts

- 9.6 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant; the development-generated traffic emissions will not have a significant impact on local air quality. It is, therefore, not considered appropriate to propose further mitigation measures for this development.
- 9.7 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law). Measures within LBC's Air Quality Action Plan, as well as London-wide measures to improve air quality delivered by the GLA, will also lead to improvements in air quality across the wider area in the future.

10 Conclusions

10.1 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction, and emissions from road traffic generated by the completed and occupied development. It has also identified whether or not the proposed development is air quality neutral (as required by the London Plan). The assessment has been based on measurements made during 2019 to ensure a worst-case assessment that does not take into account temporary reductions in pollutant concentrations as a result of reduced activity levels during the Covid-19 pandemic.

Construction Impacts

10.2 The construction works have the potential to create dust. During construction it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any residual effects will be 'not significant'.

Operational Impacts

10.3 The proposed development is car-free and will not include any on-site combustion plant. The proposed development will not therefore have a significant effect on local air quality.

10.4 The overall operational air quality effects of the development are judged to be 'not significant', and no additional mitigation has been proposed. The development is also judged to be air quality neutral.

Policy Implications

10.5 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 180 of the NPPF, being appropriate for its location in terms of its effects on the local air quality environment. It is also consistent with Paragraph 181, as it will not affect compliance with relevant limit values or national objectives. The proposed development is compliant with Camden Council Local Plan as well as with Policy SI1 of the London Plan in the following ways:

- dust mitigation measures to implement on site during demolition and construction will be included within a Construction Management Plan, to ensure residual effects are not significant;
- it will not lead to further deterioration of existing poor air quality;
- it will not cause or extend any exceedances of legal air quality limits; and
- it is better than air quality neutral.

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12 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
BEB	Building Emissions Benchmark
CAZ	Clean Air Zone
CHP	Combined Heat and Power
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
EFT	Emission Factor Toolkit
EPUK	Environmental Protection UK
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the annual mean limit value for NO ₂ but also has a high level of human exposure
GLA	Greater London Authority
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationery Office
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBC	London Borough of Camden
LDV	Light Duty Vehicles (<3.5 tonnes)

LEZ	Low Emission Zone
LGV	Light Goods Vehicle
µg/m³	Microgrammes per cubic metre
NO	Nitric oxide
NO₂	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO ₂ + NO)
NPPF	National Planning Policy Framework
NRMM	Non-road Mobile Machinery
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
OLEV	Office for Low Emission Vehicles
PHV	Private Hire Vehicle
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
RDE	Real Driving Emissions
SPG	Supplementary Planning Guidance
SPD	Supplementary Planning Document
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide
TEB	Transport Emissions Benchmark
TfL	Transport for London
TRAVL	Trip Rate Assessment Valid for London
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation
ZEC	Zero Emission Capable

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A1 London-Specific Policies and Measures

London Environment Strategy

A1.1 The air quality chapter of the London Environment Strategy sets out three main objectives, each of which is supported by sub-policies and proposals. The Objectives and their sub-policies are set out below:

“Objective 4.1: Support and empower London and its communities, particularly the most disadvantaged and those in priority locations, to reduce their exposure to poor air quality.

- *Policy 4.1.1 Make sure that London and its communities, particularly the most disadvantaged and those in priority locations, are empowered to reduce their exposure to poor air quality*
- *Policy 4.1.2 Improve the understanding of air quality health impacts to better target policies and action*

Objective 4.2: Achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action from London Boroughs, government and other partners

- *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 4.2.3 Reduce emissions from non-transport sources, including by phasing out fossil fuels*
- *Policy 4.2.4 The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality*
- *Policy 4.2.5 The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence based steps to improve air quality*

Objective 4.3: Establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting world health organization health-based guidelines for air quality

- *Policy 4.3.1 The Mayor will establish new targets for PM_{2.5} and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners*

- *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"*

A1.2 While the policies targeting transport sources are significant, there are less obvious ones that will also require significant change. In particular, the aim to phase out fossil-fuels from building heating and cooling and from NRMM will demand a dramatic transition.

Low Emission Zone (LEZ)

A1.3 The LEZ was implemented as a key measure to improve air quality in Greater London. It entails charges for vehicles entering Greater London not meeting certain emissions criteria, and affects diesel-engined lorries, buses, coaches, large vans, minibuses and other specialist vehicles derived from lorries and vans. Since 1 March 2021, a standard of Euro VI has applied for HGVs, buses and coaches, while a standard of Euro 3 has applied for large vans, minibuses and other specialist diesel vehicles since 2012.

Ultra Low Emission Zone (ULEZ)

A1.4 London's ULEZ was introduced on 8 April 2019. The ULEZ currently operates 24 hours a day, 7 days a week in the same area as the current Congestion Charging zone. All cars, motorcycles, vans and minibuses are required to meet exhaust emission standards (ULEZ standards) or pay an additional daily charge to travel within the zone. The ULEZ standards are Euro 3 for motorcycles, Euro 4 for petrol cars, vans and minibuses and Euro 6 for diesel cars, vans and minibuses. The ULEZ does not include any requirements relating to heavy vehicle (HGV, coach and bus) emissions, as these are addressed by the amendments to the LEZ described in Paragraph A1.3.

A1.5 From 25 October 2021, the ULEZ will cover the entire area within the North and South Circular roads, applying the emissions standards set out in Paragraph A1.4.

Other Measures

A1.6 Since 2018, all taxis presented for licencing for the first time had to be zero emission capable (ZEC). This means they must be able to travel a certain distance in a mode which produces no air pollutants, and all private hire vehicles (PHVs) presented for licensing for the first time had to meet Euro 6 emissions standards. Since January 2020, all newly manufactured PHVs presented for licensing for

the first time had to be ZEC (with a minimum zero emission range of 10 miles). The Mayor's aim is that the entire taxi and PHV fleet will be made up of ZEC vehicles by 2033.

A1.7 The Mayor has also proposed to make sure that TfL leads by example by cleaning up its bus fleet, implementing the following measures:

- TfL will procure only hybrid or zero emission double-decker buses from 2018;
- a commitment to providing 3,100 double decker hybrid buses by 2019 and 300 zero emission single-deck buses in central London by 2020;
- introducing 12 Low Emission Bus Zones by 2020;
- investing £50m in Bus Priority Schemes across London to reduce engine idling; and
- retrofitting older buses to reduce emissions (selective catalytic reduction (SCR) technology has already been fitted to 1,800 buses, cutting their NOx emissions by around 88%).

A2 Construction Dust Assessment Procedure

A2.1 The criteria developed by IAQM (2016), upon which the GLA's guidance is based, divide the activities on construction sites into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

A2.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

A2.3 An assessment is required where there is a human receptor within 350 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), or where there is an ecological receptor within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

A2.4 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is *negligible* and that any effects will be 'not significant'. No mitigation measures beyond those required by legislation will be required.

STEP 2: Assess the Risk of Dust Impacts

A2.5 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and
- the sensitivity of the area to dust effects (Step 2B).

A2.6 These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

Step 2A – Define the Potential Dust Emission Magnitude

A2.7 Dust emission magnitude is defined as either 'Small', 'Medium', or 'Large'. The IAQM guidance explains that this classification should be based on professional judgement, but provides the examples in Table A2.1.

Table A2.1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
Large	Total building volume >50,000 m ³ , potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities >20 m above ground level
Medium	Total building volume 20,000 m ³ – 50,000 m ³ , potentially dusty construction material, demolition activities 10-20 m above ground level
Small	Total building volume <20,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months
Earthworks	
Large	Total site area >10,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes
Medium	Total site area 2,500 m ² – 10,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m – 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes
Small	Total site area <2,500 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10,000 tonnes, earthworks during wetter months
Construction	
Large	Total building volume >100,000 m ³ , piling, on site concrete batching; sandblasting
Medium	Total building volume 25,000 m ³ – 100,000 m ³ , potentially dusty construction material (e.g. concrete), piling, on site concrete batching
Small	Total building volume <25,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout ^a	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m
Medium	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m
Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

^a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B – Define the Sensitivity of the Area

A2.8 The sensitivity of the area is defined taking account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

A2.9 The first requirement is to determine the specific sensitivities of local receptors. The IAQM guidance recommends that this should be based on professional judgment, taking account of the principles in Table A2.2. These receptor sensitivities are then used in the matrices set out in Table A2.3, Table A2.4 and Table A2.5 to determine the sensitivity of the area. Finally, the sensitivity of the area is considered in relation to any other site-specific factors, such as the presence of natural shelters etc., and any required adjustments to the defined sensitivities are made.

Step 2C – Define the Risk of Impacts

A2.10 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the *risk* of impacts with no mitigation applied. The IAQM guidance provides the matrix in Table A2.6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

A2.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance has been used as the basis for the requirements set out in Appendix A6.

STEP 4: Determine Significant Effects

A2.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.

A2.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

Table A2.2: Principles to be Used When Defining Receptor Sensitivities

Class	Principles	Examples
Sensitivities of People to Dust Soiling Effects		
High	users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms
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; or the appearance, aesthetics or value of their property could be diminished by soiling; or 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	parks and places of work
Low	the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads
Sensitivities of People to the Health Effects of PM₁₀		
High	locations where members of the public may be exposed for eight hours or more in a day	residential properties, hospitals, schools and residential care homes
Medium	locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	may include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀
Low	locations where human exposure is transient	public footpaths, playing fields, parks and shopping streets
Sensitivities of Receptors to Ecological Effects		
High	locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species	Special Areas of Conservation with dust sensitive features
Medium	locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition	Sites of Special Scientific Interest with dust sensitive features
Low	locations with a local designation where the features may be affected by dust deposition	Local Nature Reserves with dust sensitive features

Table A2.3: Sensitivity of the Area to Dust Soiling Effects on People and Property ⁴

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
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

⁴ For demolition, earthworks and construction, distances are taken either from the dust source or from the boundary of the site. For trackout, distances are measured from the sides of roads used by construction traffic. Without mitigation, trackout may occur from roads up to 500 m from sites with a *large* dust emission magnitude for trackout, 200 m from sites with a *medium* dust emission magnitude and 50 m from sites with a *small* dust emission magnitude, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table A2.4: Sensitivity of the Area to Human Health Effects ⁴

Receptor Sensitivity	Annual Mean PM ₁₀	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A2.5: Sensitivity of the Area to Ecological Effects ⁴

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

Table A2.6: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A3 EPUK & IAQM Planning for Air Quality Guidance

A3.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations”.*

Recommended Best Practice

A3.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

A3.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

A3.4 The good practice principles are that:

- New developments should not contravene the Council’s Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;

- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;
- The provision of at least 1 Electric Vehicle (EV) “rapid charge” point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - Spark ignition engine: 250 mgNO_x/Nm³;
 - Compression ignition engine: 400 mgNO_x/Nm³;
 - Gas turbine: 50 mgNO_x/Nm³.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A3.5 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

“It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the “damage cost approach” used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential”.

A3.6 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

“There may be a requirement to carry out an air quality assessment for the impacts of the local area’s emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- *the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- *the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- *the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and*
- *the presence of a source of odour and/or dust that may affect amenity for future occupants of the development”.*

Impacts of the Development on the Local Area

A3.7 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A3.8 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A3.9 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;
- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A3.10 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A3.11 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

“Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable”.

A3.12 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

“The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality”.

A3.13 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

“The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer”.

A3.14 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

A3.15 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts.

A3.16 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either ‘significant’ or ‘not significant’. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.

A3.17 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.

A3.18 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A4.

A4 Professional Experience

Dr Denise Evans, BSc (Hons) PhD MEnvSc MIAQM

Dr Evans is an Associate Director with AQC, with more than 21 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Pauline Jezequel, MSc MEnvSc MIAQM

Miss Jezequel is a Principal Consultant with AQC with over ten years' relevant experience. Prior to joining AQC she worked as an air quality consultant at AECOM. She has also worked as an air quality controller at Bureau Veritas in France, undertaking a wide range of ambient and indoor air quality measurements for audit purposes. She now works in the field of air quality assessment, undertaking air quality impact assessments for a wide range of development projects in the UK and abroad, including for residential and commercial developments, transport schemes (rail, road and airport), waste facilities and industrial sites. Miss Jezequel has also undertaken a number of odour surveys and assessments in the context of planning applications. She has experience in monitoring construction dust, as well as indoor pollutant levels for BREEAM purposes. She is a Member of the Institute of Air Quality Management.

Tomáš Liška, BSc (Hons)

Mr Liška is an Assistant Consultant with AQC, having joined in September 2020. He holds a BSc in Meteorology and Climate Science from the University of Leeds and is currently finishing his PhD at the University of Edinburgh, which investigates population exposure to air pollution and its inequality in the UK. Tomáš has a keen interest in modelling and data science. He is now gaining experience in the field of air quality monitoring and assessment.

A5 'Air Quality Neutral'

- A5.1 The GLA's SPG on Sustainable Design and Construction (GLA, 2014a), and its accompanying Air Quality Neutral methodology report (AQC, 2014), provide an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building energy use and the car use associated with the proposed development against defined emissions benchmarks for buildings and transport in London.
- A5.2 The benchmarks for heating and energy plant (termed 'Building Emissions Benchmarks' or 'BEBs') are set out in Table A5.1, while the 'Transport Emissions Benchmarks' ('TEBs') are set out in Table A5.2. In order to assess against the TEBs, it is necessary to combine the expected trip generation from the development with estimates of average trip length and average emission per vehicle. So as to ensure a consistent methodology, the report which accompanies the SPG (AQC, 2014) recommends that the information in Table A5.3 and Table A5.4 (upon which the TEBs are based) is used. Similarly, the information in Table A5.5 may be used if site-specific information are not available (AQC, 2014). For use classes other than A1, B1 and C3, trip lengths and average emissions per vehicle are not provided, thus the trip rates in Table A5.6 alone may be used to consider the air quality neutrality of a development. These have been derived from the Trip Rate Assessment Valid for London (TRAVL) database. As noted in Paragraph 4.10, the air quality neutral benchmarks are based around old planning use classes.

Table A5.1: Building Emissions Benchmarks (g/m² of Gross Internal Floor Area)

Land Use Class	NOx	PM ₁₀
Class A1	22.6	1.29
Class A3 - A5	75.2	4.32
Class A2 and Class B1	30.8	1.77
Class B2 - B7	36.6	2.95
Class B8	23.6	1.90
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
D1 (a)	43.0	2.47
D1 (b)	75.0	4.30
Class D1 (c -h)	31.0	1.78
Class D2 (a-d)	90.3	5.18
Class D2 (e)	284	16.3

Table A5.2: Transport Emissions Benchmarks

Land use	Central Activity Zone	Inner ^a	Outer ^b
NO_x (g/m²/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
NO_x (g/dwelling/annum)			
Residential (C3)	234	558	1553
PM₁₀ (g/m²/annum)			
Retail (A1)	29.3	39.3	42.9
Office (B1)	0.22	2.05	11.8
PM₁₀ (g/dwelling/annum)			
Residential (C3,C4)	40.7	100	267

^a Inner London and Outer London as defined in the LAEI (GLA, 2019).

Table A5.3: Average Distance Travelled by Car per Trip

Land use	Distance (km)		
	Central Activity Zone	Inner	Outer
Retail (A1)	9.3	5.9	5.4
Office (B1)	3.0	7.7	10.8
Residential (C3)	4.3	3.7	11.4

Table A5.4: Average Road Traffic Emission Factors in London in 2010

Pollutant	g/vehicle-km		
	Central Activity Zone	Inner	Outer
NO _x	0.4224	0.370	0.353
PM ₁₀	0.0733	0.0665	0.0606

Table A5.5: Average Emissions from Heating and Cooling Plant in Buildings in London in 2010

	Gas (kg/kWh)		Oil (kg/kWh)	
	NO _x	PM ₁₀	NO _x	PM ₁₀
Domestic	0.0000785	0.00000181	0.000369	0.000080
Industrial/Commercial	0.000194	0.00000314	0.000369	0.000080

Table A5.6: Average Number of Trips per Annum for Different Development Categories

Land use	Number of Trips (trips/m ² /annum)		
	Central Activity Zone	Inner	Outer
A1	43	100	131
A3	153	137	170

A4	2.0	8.0	-
A5	-	32.4	590
B1	1	4	18
B2	-	15.6	18.3
B8	-	5.5	6.5
C1	1.9	5.0	6.9
C2	-	3.8	19.5
D1	0.07	65.1	46.1
D2	5.0	22.5	49.0
Number of Trips (trips/dwelling/annum)			
C3	129	407	386

A6 Construction Mitigation

A6.1 Table A6.1 presents a set of best-practice measures from the GLA guidance (GLA, 2014b) that should be incorporated into the specification for the works. These measures should be written into a Dust Management Plan. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the Dust Management Plan.

Table A6.1: Best-Practice Mitigation Measures Recommended for the Works

Measure	Desirable	Highly Recommended
Site Management		
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site		✓
Develop a Dust Management Plan (DMP)		✓
Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary		✓
Display the head or regional office contact information		✓
Record and respond to all dust and air quality pollutant emissions complaints		✓
Make a complaints log available to the local authority when asked		✓
Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the Local Authority when asked		✓
Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions are being carried out and during prolonged dry or windy conditions		✓
Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and ensure that the action taken to resolve the situation is recorded in the log book		✓
Preparing and Maintaining the Site		
Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible		✓
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site		✓
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period		✓
Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution	✓	
Avoid site runoff of water or mud		✓
Keep site fencing, barriers and scaffolding clean using wet methods		✓

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		✓
Cover, seed, or fence stockpiles to prevent wind whipping		✓
Carry out regular dust soiling checks of buildings within 100 m of site boundary and provide cleaning if necessary	✓	
Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly		✓
Agree monitoring locations with the Local Authority		✓
Where possible, commence baseline monitoring at least three months before work begins		✓
Operating Vehicle/Machinery and Sustainable Travel		
Ensure all on-road vehicles comply with the requirements of the London LEZ (and ULEZ)		✓
Ensure all Non-road Mobile Machinery (NRMM) comply with London's NRMM emission standards. Currently, NRMM used on any site within Greater London are required to meet Stage IIIB of EU Directive 97/68/EC (The European Parliament and the Council of the European Union, 1997) and its subsequent amendments as a minimum, while NRMM used on any site within the Central Activity Zone, Canary Wharf or one of London's Opportunity Areas are required to meet Stage IV of the Directive as a minimum. The proposed development is within an area where this stricter requirement applies. From January 2025, NRMM used anywhere in London will be required to meet stage IV, while from January 2030 the stage V standard will apply. From January 2040 only zero emission machinery will be allowed.		✓
Ensure all vehicles switch off engines when stationary – no idling vehicles		✓
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable		✓
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials		✓
Implement a Travel Plan that supports and encourages sustainable staff travel (public transport, cycling, walking, and car-sharing)		✓
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		✓
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate		✓
Use enclosed chutes, conveyors and covered skips		✓
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate		✓
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		✓

Waste Management		
Reuse and recycle waste to reduce dust from waste materials		✓
Avoid bonfires and burning of waste materials		✓
Measures Specific to Demolition		
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust)		✓
Ensure water suppression is used during demolition operations.		✓
Avoid explosive blasting, using appropriate manual or mechanical alternatives		✓
Bag and remove any biological debris or damp down such material before demolition		✓
Measures Specific to Construction		
Avoid scabbling (roughening of concrete surfaces), if possible	✓	
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	✓	
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	✓	
For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust	✓	
Measures Specific to Trackout		
Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site		✓
Avoid dry sweeping of large areas		✓
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport		✓
Access gates should be located at least 10 m from receptors, where possible		✓
Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site	✓	