CONSTRUCTION SKILLS CENTRE & SITE ACCOMMODATION AT FORMER MARIA FIDELIS SCHOOL SITE

AIR QUALITY REPORT

August 2021

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Revision Key:
P =Preliminary Documents/Drawings – P01, P02, P02
C = Contractual Documents/Drawings – C01, C02, C03
X = As Built Mark-Up Drawings – X01, X02, X03
Z = As Built Record Drawings – Z01, Z02, Z03

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Executive Summary

This report gives an assessment of potential air quality and odour impacts associated with the proposed Construction Skills Centre and Site Accommodation at the former Maria Fidelis school site. It considers relevant national, regional and local policy and guidance.

It includes assessment of baseline conditions, potential dust impacts during construction, air quality impacts from construction and operational traffic, and odours from on-site catering. It identifies suitable mitigation where appropriate.

The construction dust assessment found a low dust risk overall without mitigation. Appropriate mitigation has been recommended.

The assessment of construction and operational road traffic emissions found negligible impacts at all receptors assessed.

For new receptors introduced by the Proposed Development, annual mean nitrogen dioxide concentrations are predicted to be higher than the air quality objective at the western and parts of the northern and southern facades of the Construction Skills Centre at ground floor level and the western façade at first floor level. The Proposed Development will be mechanically ventilated, with air drawn in from the roof. Air drawn from the roof is expected to meet air quality objectives.

The air quality neutral assessment found that building and transport emissions meet Greater London Authority requirements for air quality neutrality.

The odour risk assessment identified a high impact risk. An odour control system has been recommended to mitigate the risk.

Overall, air quality is not a barrier to the Proposed Development.

Contents

1 Introduction

1.1.1 This report has been produced by the Mace Dragados Joint Venture (MDjv) on behalf of High Speed 2 Ltd (HS2), to support a full planning application for a Construction Skills Centre and Site Accommodation at the former Maria Fidelis school site (the 'Proposed Development'). The Proposed Development does not relate to the new Maria Fidelis Catholic School site, located at 1-39 Drummond Street.

1.1.2 The Proposed Development will provide:

- a Construction Skills Centre (CSC) on behalf of London Borough of Camden (LBC), for which a similar scheme which was previously granted planning permission under LBC application reference 2019/3091/P; and
- a Site Accommodation facility to accommodate approximately 2,500 site operatives and management staff, including office space, ancillary rooms, WCs, showers and changing rooms, and on-site catering. This is required as part of the High Speed Two (HS2) railway project and will facilitate the construction of HS2 Euston Station.

1.1.3 The Proposed Development is required for a temporary period of 10 years and will be removed following the construction of HS2 Euston.

1.1.4 A summary of the application and how this report fits into the suite of documents can be found in the Planning Statement.

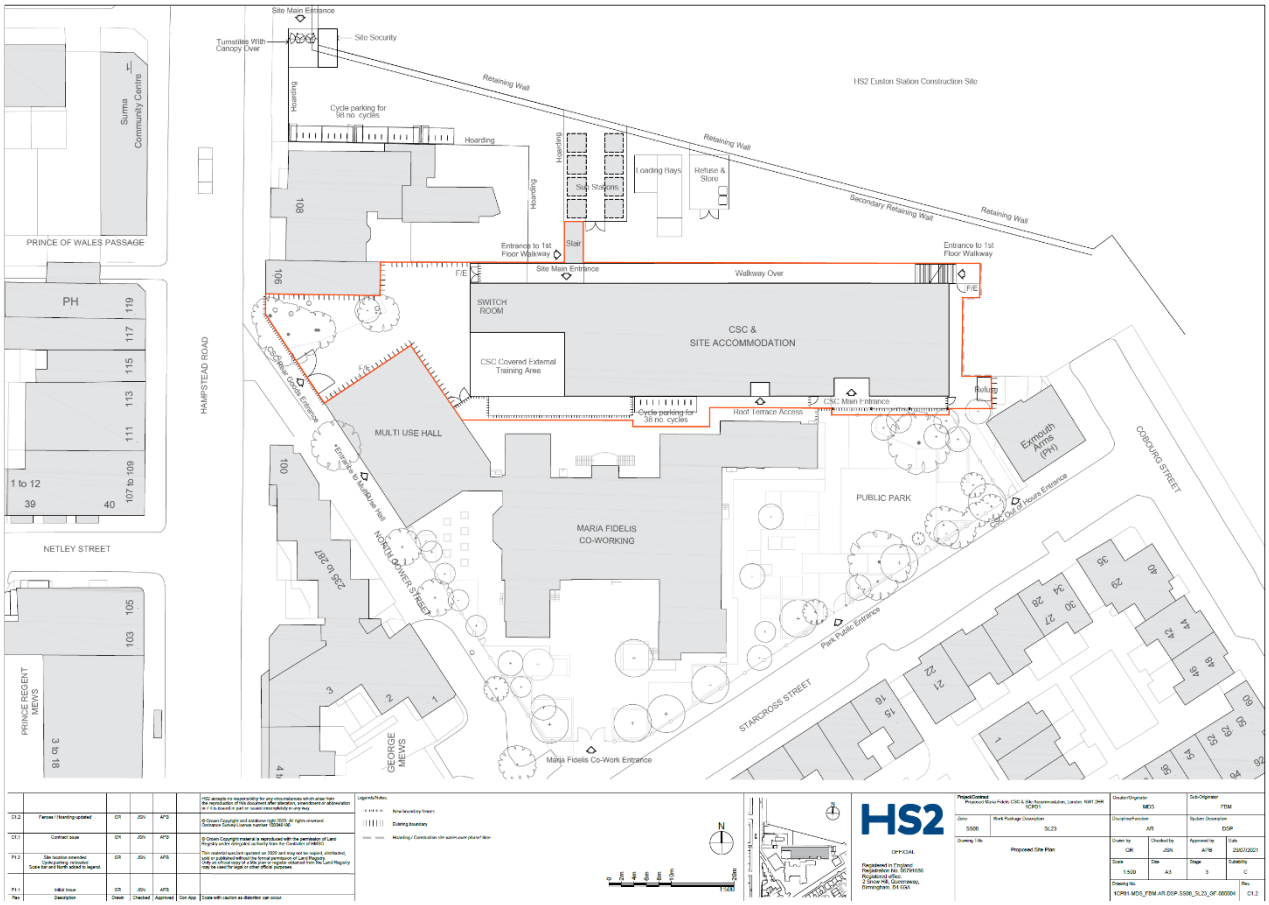
1.1.5 The Proposed Development site location plan is shown in Figure 1-1.

1.1.6 The Proposed Development has the potential to impact upon local air quality due to increased traffic arising from the Proposed Development. The Proposed Development will also be impacted upon by the existing local air quality, including road traffic emissions. Negligible emissions are expected from the CSC, since space heating and hot-water plant will be electrically powered.

1.1.7 The primary pollutants of interest for this assessment are nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$), as well as dust from the construction phase. On-site catering has the potential to release odorous emissions in the local area.

1.1.8 This report includes a baseline assessment of local air quality, establishing existing and historic air quality conditions at the Proposed Development site and in the local area, a construction phase assessment, and an operational phase assessment including an odour risk assessment. Mitigation measures are also proposed, where relevant.

Figure 1-1 Proposed Development site location plan



Description of development

1.1.9 The Proposed Development is for the erection of a six-storey combined Construction Skills Centre (Class F1(a) - Education) and Site Accommodation (Class E(g)(i) – Offices) to facilitate the construction of HS2 Euston station and provide a learning facility for a period of up to 10 years from occupation.

1.1.10 The Proposed Development would provide 1,378sqm of CSC floorspace and 5,747sqm of Site Accommodation floorspace. The overall site area is 0.24ha. The maximum height of the building would be 22.4m and the building would be 77m wide and 18m deep.

1.1.11 The building would utilise modular construction, using modern methods of construction and assembly on-site to the form described above.

1.1.12 Vehicular access to the Site Accommodation would be delivered via a combination of the existing HS2 worksite to the north and Cobourg Street. Vehicular access arrangements for the Site Accommodation would change throughout the construction and operational period to accommodate wider HS2 works to the north of the site.

Vehicular access for the Construction Skills Centre would remain as previously approved with infrequent servicing use of North Gower Street (consented under extant permission 2019/3091/P).

1.1.13 Pedestrian access to the Construction Skills Centre would only be via the open space to the south of the building. Pedestrian access to the Site Accommodation would only be from Hampstead Road and through the existing HS2 worksite to the north.

1.1.14 The Proposed Development will be car-free and will not provide parking spaces. It is close to public transport, so connectivity is good.

2 Legislation and policy

2.1 National policy

Air Quality Strategy for England, Scotland, Wales and Northern Ireland

2.1.1 The *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*[1] sets the framework for government policy on air quality in the UK. The Air Quality Strategy sets out ambient air quality objectives (AQOs) (shown in Table 2-1) to be achieved and introduces a policy framework for tackling PM_{10} and $PM_{2.5}$. In setting AQOs, due account was taken of health and socioeconomic cost-benefit factors, together with the practicalities of achieving such targets. Ambient AQOs are set out in legislation in *The Air Quality (England) Regulations 2000*[2], as amended[3].

Table 2-1 UK ambient AQOs relevant to the assessment

Pollutant	AQOs	Measured as	Dates to be achieved and maintained thereafter
NO_2	200 µg/m^3, not to be breached more than 18 times per year	One-hour mean	31 December 2005
	40 µg/m^3	Annual mean	31 December 2005
PM_{10}	50 µg/m^3, not to be breached more than 35 times per year	24-hour mean	31 December 2004
	40 µg/m^3	Annual mean	31 December 2004
$PM_{2.5}$	25 µg/m^3	Annual mean	2020

The Environment Act 1995

2.1.2 The *Environment Act 1995*[4], specifically Sections 82-84, requires all local authorities to carry out periodic reviews of air quality within their administrative areas. This review and assessment process now follows a phased approach, whereby local authorities only undertake a level of assessment that is commensurate with the risk of an AQO being breached. The aim of this review process is to assess whether the AQOs are likely to be achieved. Areas where objectives are likely to be breached are to be declared air quality management areas (AQMAs) by the local authorities.

[1] Department for Environment, Food and Rural Affairs, et al, 2007. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 1.

[2] The Air Quality (England) Regulations 2000 (2000 No. 928).

[3] The Air Quality (England) (Amendment) Regulations 2002 (2002 No. 3043).

[4] Environment Act 1995, Part IV Air Quality.

National Planning Policy Framework and Planning Practice Guidance

2.1.3 The revised *National Planning Policy Framework* (NPPF)[5] was published in July 2018 and later updated in July 2021. Paragraph 174 states:

'Planning policies and decisions should contribute to and enhance the natural and local environment by:

'e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions….'

2.1.4 Paragraph 186 states:

'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'.

2.1.5 The *Planning Practice Guidance – Air Quality*[6] (PPG) supports the NPPF and was first published online in 2014 and later updated in November 2019 to reflect changes to the NPPF. The PPG provides *'guiding principles on how planning can take into account the impact of new development on air quality'*.

2.1.6 This guidance highlights the role of the local air quality management regime in pursuing national AQOs and its implications for planning. It also includes recommendations on how detailed an air quality assessment (AQA) should be or how impacts on air quality can be mitigated.

Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems

2.1.7 Although withdrawn in 2017, Defra *Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*[7] still offers a useful framework for

[5] National Planning Policy Framework, 2021. Ministry of Housing, Communities and Local Government.

[6] Planning Practice Guidance – Air Quality, 2019. Ministry of Housing, Communities and Local Government.

[7] Defra (2005). Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems.

assessing odour risk from commercial kitchens. Recommended control measures are suggested, based on odour risk.

2.2 Regional and local policy

The London Plan 2021

2.2.1 Policy GG3 of *The London Plan* [8] concerns public health and states that:

'To improve Londoners' health and reduce health inequalities, those involved in planning and development must … seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution.'

2.2.2 Policy D3 states that:

'Development Plans should… help prevent or mitigate the impacts of noise and poor air quality.'

2.2.3 Policy SI1 relates specifically to air quality. Relevant to this assessment, it states:

'…
'B. To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:
'1. Development proposals should not:
'a. lead to further deterioration of existing poor air quality
'b. create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits
'c. create unacceptable risk of high levels of exposure to poor air quality
'2. In order to meet the requirements in Part 1, as a minimum:
'a. development proposals should 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.
'…

[8] Mayor of London, (2021). The London Plan, Greater London Authority, London.

'D. In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.
'E. Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.'

London Environment Strategy

2.2.4 On 31st May 2018, the Greater London Authority published *The London Environment Strategy*[9]. It includes policies and proposals to improve air quality. The following policies make recommendations for development management, to be enforced via the London Plan:

- Encouraging *'new developments to take into account local air quality so they are suitable for use and location'* by reducing exposure to poor air quality'
- Ensuring that the London Atmospheric Emissions Inventory is regularly updated to better understand pollution sources in London
- Working with *'the construction industry and other users of Non-Road Mobile Machinery (NRMM), such as event organisers, to prevent or reduce NRMM emissions'* and
- Working with *'industry and other partners to seek reductions in emissions from construction and demolition sites'*.

Mayor's Transport Strategy

2.2.5 The Mayor's Transport Strategy[10] was adopted in March 2018 and details proposed changes in London's transport network over the coming years. The Strategy particularly emphasises the potential for active travel to improve public health through increased physical activity and reduced air pollution and recommends a London-wide strategic cycle network.

2.2.6 The Strategy refers directly to air quality with Policy 6 stipulating that:

'The Mayor, through TfL and the boroughs, and working with stakeholders, will take action to reduce emissions – in particular diesel emissions – from vehicles on London's streets, to improve air quality and support London reaching compliance with UK and EU legal limits as soon as possible.'

[9] The Mayor's London Environment Strategy. (2018). Greater London Authority.

[10] Greater London Authority (2018) Mayors Transport Strategy, Greater London Authority, London.

2.2.7 In addition, the Strategy identifies measures to be implemented in improving air quality. These include:

- expansion of the Ultra-Low Emission Zone (ULEZ) and progressive tightening of vehicle criteria;
- retrofitting of existing vehicles, and purchase of electric and hydrogen vehicles to achieve a zero emission TfL bus fleet from 2037;
- expanding electric vehicle charging and hydrogen fuelling infrastructure
- introducing a 'Liveable Neighbourhoods' programme of local measures designed to target local air quality hotspots at borough level. Targeted measures may include road charges, vehicle and parking restrictions, and support for electric vehicle infrastructure and zero emission car clubs.

Camden Local Plan (2017)

2.2.8 Policy CC4 Air Quality of the *Camden Local Plan*[11] states:

'The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.
'The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.
'Air quality assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact.
'Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.
'Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.'

2.2.9 Policy A1 Managing the Impact of Development, states:

'The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.
'We will:
'a. Seek to ensure that the amenity of communities, occupiers and neighbours is protected;
'b. seek to ensure development contributes towards strong and successful communities by balancing the needs of development with the needs and characteristics of local areas and communities;

[11] London Borough of Camden (2017). Camden Local Plan, London Borough of Camden, London.

'c. resist development that fails to adequately assess and address transport impacts affecting communities, occupiers, neighbours and the existing transport network; and
'd. require mitigation measures where necessary.

'The factors we will consider include: …

'h. transport impacts, including the use of Transport Assessments, Travel Plans and Delivery and Servicing Management Plans;
'i. impacts of the construction phase, including the use of Construction Management Plans; …
'k. odour, fumes and dust; …'

2.2.10 Section 6.22 outlines LBC's approach to minimising the impacts of potential odours:

'We will require all development likely to generate nuisance odours to install appropriate extraction equipment and other mitigation measures. These should be incorporated within the building where possible. External extraction equipment and ducting should be sited sensitively, particularly on listed buildings and within conservation areas. Further details can be found in our supplementary planning documents Camden Planning Guidance on design and Camden Planning Guidance on amenity.'

Camden Planning Guidance on Design

2.2.11 LBC has produced Camden Planning Guidance (CPG) documents encompassing all aspects of development. These documents provide advice and information on how the Council applies planning policies.

2.2.12 The *Camden Planning Guidance on Design*[12] was updated in January 2021. On odour, paragraph 9.13 states:

'Where mechanical or passive ventilation is required to remove odour emissions, the release point for odours must be located above the roofline of the building and, wherever possible, adjacent buildings.'

London Borough of Camden Air Quality Action Plan

2.2.13 LBC published the latest version of their Air Quality Action Plan (AQAP), the *Clean Air Action Plan 2019-2022*[13], during 2018. LBC have been required to produce an AQAP due to the entire borough remaining an AQMA since it was

[12] London Borough of Camden. 2021. Camden Planning Guidance on Design. Available from: https://www.camden.gov.uk/documents/20142/4823269/Design+CPG+Jan+2021.pdf/086b8201-aa57-c45f-178e-b3e18a576d5e?t=1611580522411

[13] London Borough of Camden, 2019.Camden Clean Air Action Plan 2019-2022. Available from: https://www.camden.gov.uk/documents/20142/0/Clean+air+action+plan+2019-2022_final2.pdf/f7cd1a68-e707-0755-528a-59388adf0995

declared in 2002 due to annual mean concentrations of NO_2 and daily mean PM_{10} concentrations breaching or being expected to breach the prevailing AQOs.

2.2.14 The AQAP states, '*In January 2018, Camden became the first London council to formally adopt the World Health Organization's (WHO) air quality guidelines*.'

2.2.15 The AQAP indicates that its key priorities include reducing emissions through the development management system. The following measures summarise the steps which LBC intend to take in relation to managing the impacts from development:

- securing funding from developers to manage construction impacts;
- ensuring all major development sites have demolition management and/or construction management plans;
- ensuring all medium and high-risk sites have real-time particulate monitoring on site and that the information from this monitoring is easily accessible to the public;
- developing a 'power generation hierarchy' for construction sites, with the aim to reduce the number of diesel generators used;
- requiring cumulative impact assessments for developments (when AQAs are prepared and submitted) to identify what measures should be taken to reduce impacts on local communities;
- controlling construction lorry delivery times through Section 106 agreements and/or planning conditions, for example by avoiding drop-offs between 8am and 9am, which coincides with school drop-off times;
- ensuring non-road mobile machinery (NRMM, such as construction plant) are controlled as outlined in the Mayor of London's Supplementary Planning Guidance on Controlling Dust and Emissions During Construction and Demolition;
- enforcing policies deterring the use of combined heat and power (CHP) plant and biomass and requiring the submission of air quality neutral and air quality positive assessments in accordance with the London Plan;
- ensuring new developments include adequate, appropriate and well-located green space and infrastructure; and,
- maintaining and increasing the amount of green infrastructure in Camden, including the number of trees.

2.2.16 LBC also propose to create Clean Air Zones around schools from 2022, with developers expected to install mitigation measures for the project duration.

2.3 Technical standards and guidance

Land-Use Planning & Development Control: Planning for Air Quality

2.3.1 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have developed a procedure for assessing the significance of changes in traffic volume on local air quality in their guidance document, *Land-Use Planning*

& Development Control: Planning for Air Quality[14] (the EPUK-IAQM guidance). The procedure is designed to assess potential impacts resulting from changes in road use, including realignment, expansion and increased traffic flow. It can also be used to assess the potential air quality impacts of future CHP plant or boilers. An assessment of impacts from the Proposed Development was carried out in accordance with the EPUK-IAQM guidance method.

Guidance on the Assessment of Dust from Construction and Demolition

2.3.2 The IAQM has produced guidance on the assessment of air quality impacts from construction activities entitled the *Guidance on the Assessment of Dust from Construction and Demolition*[15] (the IAQM 2014 guidance). This guidance provides a framework for assessing the risk of dust effects that may arise and suggests appropriate dust and air emissions mitigation measures for sites according to the level of risk.

2.3.3 The Mayor of London produced Supplementary Planning Guidance entitled *The Control of Dust and Emissions during Demolition and Construction* ('the Dust and Emissions SPG')[16] in 2014. This guidance is widely referred to in assessments of construction impacts in and outside London. It recommends that the latest IAQM 2014 guidance is used to assess the impacts of fugitive dust generated from construction sites. It also identifies mitigation measures, including in relation to construction site monitoring and NRMM controls, which should be enforced at construction sites.

Local Air Quality Management: Technical Guidance TG16

2.3.4 The Department for Environment, Food and Rural Affairs (Defra) technical guidance note, the *Local Air Quality Management: Technical Guidance (TG16)* [17] (TG16), is intended to provide guidance to local authorities undertaking the local review and assessment process. This includes a detailed process for dispersion model verification. It is also used in developing methods for air quality assessments.

[14] Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. V1.2. Environmental Protection UK and the Institute of Air Quality Management, London

[15] Institute of Air Quality Management, 2014, incorporating 2016 updates. *Guidance on the assessment of dust from demolition and construction.* Institute of Air Quality Management.

[16] Mayor of London, 2014. The Control of Dust and Emissions During Construction and Demolition: Supplementary Planning Guidance. London: Greater London Authority.

[17] Department for Environment, Food and Rural Affairs. 2018. Local Air Quality Management: Technical Guidance TG(16)

Sustainable Design and Construction: Supplementary Planning Guidance

2.3.5 The Greater London Authority's *Sustainable Design and Construction Supplementary Planning Guidance* [18] (the SD&C SPG) includes guidance on how boroughs can take forward the air quality neutral approach set out in the London Plan. It identifies emission benchmarks that have been produced for buildings' operation and for transport across London, based on the latest technology. The *Air Quality Neutral Planning Support* guidance[19] (the GLA Air-Quality-Neutral guidance) describes the method recommended to be used to assess for the air quality neutrality of developments.

Guidance on Monitoring in the Vicinity of Demolition and Construction Sites

2.3.6 IAQM guidance on monitoring for demolition and construction[20] outlines methods which can be used to monitor dust and air quality generated from construction sites.

Air Quality Supplementary Planning Document

2.3.7 The *Camden Planning Guidance: Air Quality*[21] ('the Camden Air Quality Planning Guidance'), adopted by LBC in 2021, is a Supplementary Planning Document considered as material in determining planning applications. The SPD outlines an assessment method which should be considered as material in the determination of planning applications. The Camden Air Quality Planning Guidance outlines a method to determine whether assessment is required, including whether this should be a 'basic' or 'detailed' assessment and, where detailed assessments are required, discusses the approach which should be undertaken to facilitate detailed dispersion modelling. Mitigation measures which should be considered, depending on the proposal type, are also outlined.

London Councils Air Quality and Planning Guidance

2.3.8 The *London Councils Air Quality and Planning Guidance*[22] (the London Councils guidance) outlines an approach to assess air quality, recommending criteria which can be used to determine which schemes require an air quality assessment and the principles which assessments should work to. The guidance

[18] Greater London Authority, 2014, Sustainable Design and Construction, The London Plan Supplementary Planning Guidance, Greater London Authority, London.

[19] Air Quality Consultants, Environ. 2014. Air Quality Neutral Planning Support: GLA 80371

[20] Institute of Air Quality Management, 2018. Guidance on Monitoring in the Vicinity of Demolition and Construction Sites.

[21] London Borough of Camden, 2021. *Camden Planning Guidance: Air Quality.* Available from: https://www.camden.gov.uk/documents/20142/4823269/Air+Quality+CPG+Jan+2021.pdf/4d9138c0-6ed0-c1be-ce68-a9ebf61e8477?t=1611580574285

[22] London Air Pollution Planning and the Local Environment (APPLE) Working Group, 2007. *Air quality and planning guidance:*

includes criteria which have been used within this assessment to determine the significance of effects from development and to assess the extent of mitigation which may be required where developments would expose future users to poor ambient air quality. Potential air quality mitigation measures are also outlined.

Air Quality Assessments in planning applications

2.3.9 The guidance available from the *Air Quality Assessments in Planning Applications*[23] LBC webpage has also been used to determine the assessment scope.

2.3.10 As explained in Section 3, the Proposed Development has been assessed as requiring a detailed application. Detailed assessments are expected to include the following:

'air quality dispersion modelling data carried out in accordance with the London Councils Air Quality and Planning Guidance
'an indication of the number of receptors which will be exposed to poor air quality as a result of the development. You should show their location on a map. The significance of air pollution exposure should be quantified in accordance with the 'Air Quality Impact Significance Criteria – New Exposure'. This is outlined in the NSCA Guidance Note
'an outline and justification of mitigation measures associated with the design, location and operation of the development in order to reduce air pollution and exposure to poor air quality. Where a proposed development is in an area of poor air quality it is essential to demonstrate that from the earliest stages, the building has been designed to reduce occupant exposure. This includes consideration of orientation, elevation of residences, and the use of green infrastructure such as green walls, screens and trees'

2.3.11 The NSCA Guidance Note referred to has now been superseded by the EPUK-IAQM guidance. The EPUK-IAQM guidance was therefore used to assess the impacts predicted at individual existing receptor locations.

2.4 HS2 policy

HS2 Air Quality Strategy

2.4.1 The HS2 Air Quality Strategy[24] sets out how emissions associated with construction of the HS2 scheme will be managed. It also supports the HS2 Code of Construction Practice[25].

[23] LBC, n.d. Air quality assessments in Planning Applications. Available from: https://www.camden.gov.uk/air-quality-assessment [Accessed 29th April 2021].

[24] HS2 Ltd, July 2017. Air Quality Strategy

[25] HS2 Ltd, February 2017. Environmental Minimum Requirements Annex 1: Code of Construction Practice

HS2 Phase One Code of Construction Practice

2.4.2 The HS2 Code of Construction Practice for Phase One sets out measures and standards for the nominated undertaker and contractors to undertake during construction of HS2 Phase One. This includes mitigation measures for dust and air quality. The Code of Construction Practice (CoCP) will be applied at the Proposed Development.

HS2 Information Paper E31

2.4.3 Information Paper E31: Air Quality[26] outlines how potential air quality impacts of the HS2 Phase One scheme will be managed. It includes emissions standards for construction vehicles and NRMM. These standards will be applied at the Proposed Development.

2.5 Air quality assessment implications

2.5.1 The legislation, policy and guidance above set the framework for this air quality assessment. Relevant aspects have been incorporated into the assessment and considered in drawing any conclusions.

[26] HS2 Ltd, February 2017, High Speed Two Phase One Information Paper E31:

3 Air quality assessment method

3.1 Overall approach

3.1.1 The approach taken for assessing the potential air quality impacts of the Proposed Development is as follows:

- baseline characterisation of local air quality;
- qualitative impact assessment of construction phase of the Proposed Development;
- detailed assessment of air quality impacts attributable to increases in vehicle movements as a result of the Proposed Development (both while undergoing construction and once operational);
- qualitative odour risk assessment of the Proposed Development's on-site catering;
- recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised; and,
- identification of residual impacts resulting from the Proposed Development.

Pollutants

3.1.2 The main pollutants for consideration in this assessment are:

- fugitive PM_{10}, $PM_{2.5}$ and dust emissions from construction-related activities; and
- NO_2, PM_{10} and $PM_{2.5}$ emissions from existing baseline traffic and additional traffic attributable to the Proposed Development.

3.1.3 Max Fordham LLP (Max Fordham), the mechanical engineers for the Proposed Development site, advised that all proposed plant for space heating and hot water will be electrically powered. Therefore on-site emission sources of combustion do not require assessment.

3.2 Baseline assessment

3.2.1 Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air, including road traffic and industrial sources.

3.2.2 A desk-based study has been undertaken using data obtained from continuous and diffusion tube monitoring stations maintained by LBC and from the United Kingdom Air Information Resource (UK-AIR) website maintained by the Defra.

3.2.3 The Proposed Development site is located adjacent to Euston Station and the site of HS2 Phase One works. HS2 Ltd undertakes NO_2 air quality monitoring using a network of diffusion tubes in the vicinity. Annual mean NO_2 concentrations monitored at these monitoring sites have also been summarised.

3.3 Construction phase dust assessment

3.3.1 Emissions from construction activities, particularly in the form of dust, have the potential to cause a loss of amenity, due to dust soiling. The finer fraction of dust, in the form of PM_{10} and particulates of finer fractions, has the potential to affect human health.

3.3.2 Key sources of air pollution from construction sites include:

- earth-moving and remediation activities;
- general construction activities, which may include, concrete mixing, cutting, grinding etc.; and
- dust and exhaust emissions from haulage vehicles on site and on local roads.

3.3.3 Given the variability of construction sites and the range of activities undertaken, making an accurate assessment of the dust and air pollutants generated is rarely feasible or practicable. Instead, a qualitative assessment has been undertaken to examine potential areas of concern and identify the best practicable means for eliminating, minimising and mitigating potential emissions.

3.3.4 The IAQM 2014 guidance and the Dust and Emissions SPG have been used to undertake the risk assessment. The method recommended by this guidance is outlined in Appendix A.

3.4 Assessment of vehicle emissions (construction and operational phases)

3.4.1 Road traffic is a primary source of emissions to air. The combustion of fuel in vehicles leads to several harmful by-products which can affect air quality in the vicinity of roads. Areas with high traffic volumes or near to major roads often experience elevated pollutant levels, particularly in the form of NO_2, PM_{10} and $PM_{2.5}$). Fixed sources, such as boilers and CHP plant, can also be important emissions sources.

3.4.2 Table 3-1 summarises the criteria referenced in the Camden Air Quality Planning Guidance to determine when an assessment is required. The reader should review the criteria from left to right, selecting the most appropriate response in turn. As the Proposed Development comprises over 2,500m^2 of internal floorspace, it would constitute a 'major' application as defined in the Town and Country Planning Act. The Proposed Development is located in an area of poor air quality (see Section 4), will introduce 'sensitive' receptors and is expected to lead to a minor net increase in traffic, during both construction and operation. Consequently, a detailed assessment, including air quality neutral and construction dust risk assessment, is required.

Table 3-1 Criteria replicated from the Camden Air Quality Planning Guidance indicating when an assessment is required, and the contents of the assessment to be undertaken

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

Notes:
1 Area of poor air quality - an area with NO_2 or PM_{10} concentrations within 5% below the AQO, 38µg/m^3.
2 Air quality impacts - Produces changes in emissions from building sources, small industrial processes (including generators for emergency backup power, short-term operating reserve (STOR) and similar), or vehicle movements. (STOR power generators are those used intermittently to supply intensive amounts of electricity to the grid at short notice)

3.5 Dispersion modelling method

3.5.1 As the Proposed Development has the potential to impact on local air quality due to increased traffic arising whilst construction works take place, and from delivery and servicing vehicles generated once operational, the impacts of the additional road traffic related to the Proposed Development has been assessed.

3.5.2 The ADMS-Roads Extra v5 Gaussian dispersion model was used to assess emissions from road traffic attributable to the Proposed Development when it commences operation and during the year construction activities commence. Full details of the assessment method and model input data are provided in Appendix B.

3.5.3 It is understood that the CSC included within the Proposed Development plans will be used by those aged 16 or older and for courses which may last some months.

3.5.4 TG16 provides some indicative definitions regarding the occasions upon which receptors can be considered as sensitive to AQOs with different averaging periods. The facades of schools, hospitals and residential premises are regarded as being relevant to the annual mean AQOs. For this reason, it is considered that the annual, 24-hour (daily) and hourly mean AQOs apply to future users of the CSC. Consequently, this assessment has also assessed the potential for the Proposed Development to expose future site users into an area of poor ambient air quality.

3.5.5 For the avoidance of doubt, the HS2 accommodation (office space), spread over the first to fifth floors, is office space. The AQOs do not apply to workplaces, as it is assumed that exposure is controlled by employers under the Health and Safety at Work Act. For this reason, users of the HS2 accommodation are not considered sensitive Proposed Development site users and the exposure of HS2 personnel is not specifically assessed.

3.5.6 The method adopted for this assessment takes into account current best practice guidance for assessment of air quality, including the Camden Air Quality Planning Guidance, London Councils and EPUK-IAQM guidance.

Assessment scenarios

3.5.7 Predictions of NO_2, PM_{10} and $PM_{2.5}$ were made for the following scenarios:

- **Scenario 1 (S1):** baseline 2019: base year;
- **Scenario 2 (S2):** Future baseline 2022, without the Proposed Development in place;
- **Scenario 3 (S3):** 2022 with the Proposed Development in place;
- **Scenario 4 (S4):** future baseline 2021, modelled to represent the year during which construction works commence (construction related activities will be completed during 2022); and,
- **Scenario 5 (S5):** 2021 during construction, modelled to represent the year during which construction works commence (construction related activities will be completed during 2022).

3.5.8 Defra's emissions factors toolkit was used to determine the emissions of NOx, PM_{10} and $PM_{2.5}$ from construction and/ or operational traffic along the affected links.

3.5.9 In accordance with the Camden Air Quality Planning Guidance, base-year (2019) emissions factors and background concentrations have been used for all scenarios.

3.5.10 The year 2019 was selected as it is the latest year for which a full calendar year of monitoring data and Department for Transport traffic data are available. An explanation of model verification and how traffic data were used is provided in Appendix B.

3.5.11 Using 2019 data also avoids issues with 2020 data, where ambient air quality was affected by the impacts of the Coronavirus pandemic on local and regional road traffic volumes and activity at workplaces including construction sites.

3.5.12 The use of 2019 emissions factors and background concentrations is pessimistic, as vehicle emissions and background concentrations are widely expected to decrease in future years as cleaner vehicles occupy a larger portion of the vehicle fleet. The ULEZ is also due to expand to include the Proposed Development site after October 2021. The ULEZ will apply a charge to any vehicles entering and leaving the zone where they do not meet specific emissions standards. It is expected to lead to substantial reductions in emissions from vehicles using the road network. Consequently, the predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ are highly likely to be pessimistic.

3.6 Significance criteria

Construction phase

3.6.1 The risk of dust impacts from construction activities were defined using the method outlined in Appendix A. The significance of the potential for dust to affect sensitive receptors has been assessed using professional judgement.

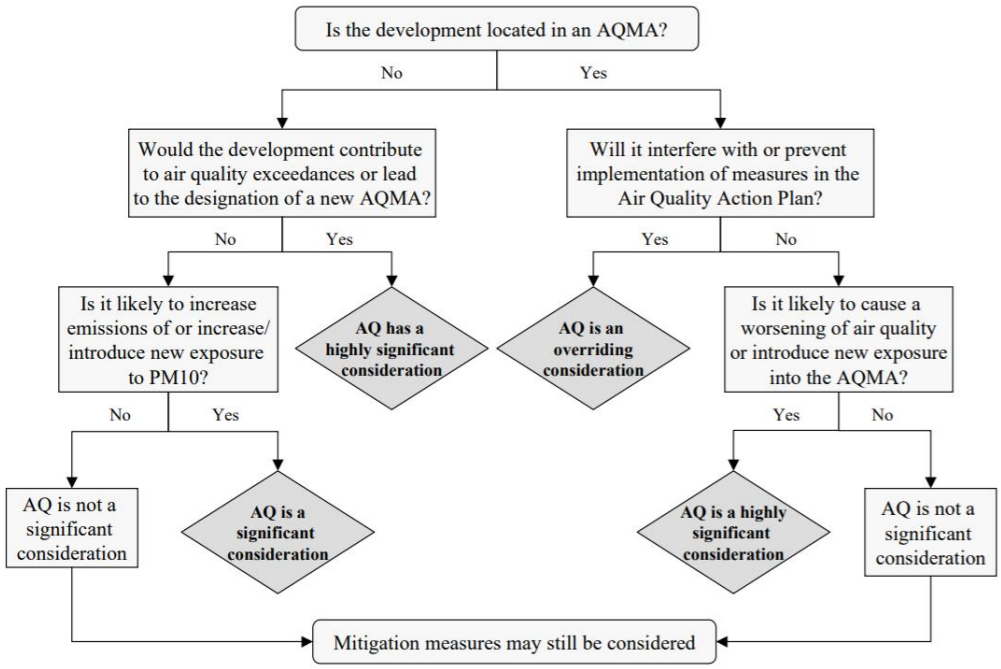
Operational phase

3.6.2 The Camden Air Quality Planning Guidance does not specifically include guidance detailing the potential air quality impacts associated with the Proposed Development and instead indicates that impacts should be assessed in accordance with the London Councils guidance.

3.6.3 The guidance includes a flow chart which can be used to determine the significance of effects on local air quality, which is replicated in Figure 3-1 below. The Proposed Development is located within an AQMA but is not anticipated to interfere with or prevent the implementation of measures in the AQAP (due to its modest size and scale, and the temporary nature of the Proposed Development).

3.6.4 This assessment has sought to determine whether the Proposed Development could lead to a worsening of air quality or introduce new exposure into the AQMA.

Figure 3-1 Criteria replicated from the London Councils guidance indicating when an assessment is required and the content of the assessment to be undertaken



Impact magnitude – proposed receptors

3.6.5 To determine the potential for future users of the Proposed Development to be introduced into an area of poor ambient air quality, concentrations at the on-site receptors were compared to the applicable AQOs (summarised in Table 2-1).

3.6.6 The London Councils guidance states that *'in determining both the significance of exposure to air pollution and the levels of mitigation required, consideration should be given to the… Air Pollution Exposure Criteria (APEC)',* which are summarised in Table 3-2 below. The criteria have been used to determine mitigation requirements.

Table 3-2 Criteria from the London Councils guidance, including recommendations for mitigation

	Criteria met		
Scale	**Applicable range NO_2 annual mean**	**Applicable range PM_{10}**	**Recommendation**
APEC-A	>5% below national objective	**Annual mean:** > 5% below national objective **24 hr:** > 1-day less than national objective	No air quality grounds for refusal; however, mitigation of any emissions should be considered.

Criteria met			
Scale	**Applicable range NO_2 annual mean**	**Applicable range PM_{10}**	**Recommendation**
APEC-B	Between 5% below or above national objective	**Annual mean:** Between 5% above or below national objective **24 hr:** Between one day above or below national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered, and internal pollutant emissions minimised.
APEC-C	>5% above national objective	**Annual mean:** > 5% above national objective **24 hr:** > one day more than national objective.	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/ industrial land uses should be considered further.

Impact magnitude – existing receptors

3.6.7 The London Councils guidance does not provide criteria that can be used to assess the magnitude of change in air quality brought about by road traffic attributable to the Proposed Development. Consequently, the potential impacts of the Proposed Development were assessed by comparing estimated pollutant concentrations with the AQOs (Table 2-1), with and without the Proposed Development in place.

3.6.8 In addition to the AQOs, the EPUK-IAQM guidance descriptors for magnitude of impact were used to assess the annual mean changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations, primarily because they consider effects in terms of the magnitude of change from predicted concentrations and also relative to the AQOs.

3.6.9 The overall significance of effects was determined by considering the impact magnitudes assigned at each receptor, and whether any of the receptors were predicted to breach one or more of the assessed AQOs in S3 or S5, where they were not predicted to in S2 or S4.

3.6.10 Table 3-3 shows the EPUK-IAQM guidance impact descriptors that take account of the percentage change in concentration relative to the air quality assessment level and the annual mean concentration at the receptor during the assessment year.

Table 3-3 Air quality impact descriptors for changes to annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations

Long-term average concentration at receptor in assessment year	% Change in concentration relative to air quality assessment level			
	1	2 – 5	6 – 10	>10
75% or less of air quality assessment level	Negligible	Negligible	Slight	Moderate
76 – 94% of air quality assessment level	Negligible	Slight	Moderate	Moderate
95 – 102% of air quality assessment level	Slight	Moderate	Moderate	Substantial
103 – 109% of air quality assessment level	Moderate	Moderate	Substantial	Substantial
110% or more of air quality assessment level	Moderate	Substantial	Substantial	Substantial

Note: The air quality assessment level is relevant ambient AQO. For annual mean NO_2, for instance, the AQO 40µg/m^3. The air quality assessment level is therefore 40µg/m^3 for annual mean NO_2.

3.6.11 Changes in the hourly mean NO_2 and daily mean PM_{10} concentrations should not be assessed using the EPUK-IAQM guidance criteria specified above. Consequently, the following impacts have been considered to represent significant effects at a specific receptor location:

- Where the Proposed Development causes a receptor to breach an annual mean NO_2 concentration of 60µg/m^3, where it did not without the Proposed Development in place; and/or,
- Where the Proposed Development causes a receptor to breach the daily mean PM_{10} AQO more than the 35 times per year permissible.

3.6.12 The overall significance of effects on local air quality, including background pollutant concentrations, has been judged from the following factors:

- the existing and future air quality in the absence of the Proposed Development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

3.6.13 The air quality assessment levels used in this assessment relate to the national AQOs.

3.7 Air quality neutral assessment

3.7.1 The GLA Air-Quality-Neutral guidance[12] sets out standards that major developments must meet to be considered air quality neutral. Comparison with these standards was made to determine whether the Proposed Development will meet these requirements. Total building emissions and transport emissions for

the appropriate land-use classes of the Proposed Development have been calculated and compared against the benchmarks.

3.8 Odour risk assessment

3.8.1 An odour risk assessment was carried out using the method in Annex C of Defra's 2005 odour guidance[7]. The method allows dispersion, receptor proximity, kitchen size and cooking type to be rated for odour risk. Tables 3-4 and 3-5 show the scoring criteria and odour control requirement matrix.

Table 3-4 Odour risk scoring criteria

Criteria	Rating	Score	Description
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10m/s
	Moderate	10	Discharging 1m above eaves at 10-15m/s
	Good	5	Discharging 1m above ridge at 15m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge
Size of kitchen	Large	5	More than 100 covers or large sized take away
	Medium	3	Between 30 and 100 covers or medium sized take away
	Small	1	Less than 30 covers or small takeaway
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish and chips
	High	7	Kebab, Vietnamese, Thai or Indian.
	Medium	4	Cantonese, Japanese, Chinese.
	Low	1	Most pubs, Italian, French, pizza or steakhouse.

Table 3-5 Odour control requirement matrix

Impact risk	Odour control requirement	Significance score
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very High	Very high level odour control	More than 35

3.9 Provision of supplementary air quality documentation

3.9.1 LBC require air quality assessments to be submitted with their 'Air Quality Proforma' and 'Camden air quality planning checklist'. These are presented in Appendix C.

4 Baseline conditions

4.1 Proposed Development site description

4.1.1 The Proposed Development is in inner London, within the LBC AQMA.

4.1.2 The western Proposed Development site boundary is located adjacent to Hampstead Road. The construction site for the consented HS2 Phase One expansion to Euston Station is to the north and east of the site. The Proposed Development site is separated from Euston Road to the south by existing residences and the former Maria Fidelis school.

4.2 Local authority review and assessment information

4.2.1 LBC declared the whole borough an AQMA during 2002 due to known or anticipated breaches of the annual mean NO_2 and 24-hour mean PM_{10} AQOs. The Proposed Development site is therefore located within an AQMA.

4.2.2 Each year, LBC produce an Air Quality Annual Status Report summarising the results of monitoring undertaken in the area, progress made on improving air quality within its jurisdiction, and consequently on whether the AQMA should be maintained. The most recent Annual Status Report available at the time of this assessment (the 2020 report, reviewing 2019) did not suggest that the AQMA is expected to be revoked.

4.3 LBC air quality monitoring

4.3.1 LBC monitored at 20 locations within 1.5km of the Proposed Development site during 2019, the latest year for which monitoring data are available. Table 4-1 below outlines the annual mean NO_2 monitoring locations monitored at these sites over the last five years. The results indicate that the annual mean NO_2 AQO has typically been met at urban background locations, but has been breached at some roadside locations, including Euston Road, the nearest A-road to the Proposed Development site where monitoring has taken place. At each of the monitoring sites presented for which five years of data are available, it is apparent that annual mean NO_2 concentrations have reduced at both roadside and background locations.

Table 4-1 Annual mean NO_2 concentrations monitored by LBC at locations within 1.5km of the Proposed Development site

Site ID	Site name	Site type	Distance from Proposed Devt. site (km)	Annual mean NO_2 concentration ($\mu g/m^3$)				
				2015	2016	2017	2018	2019
CA29	Endsleigh Gardens	Roadside	0.45	-	-	-	-	**48.34**
CD9	Euston Road	Roadside	0.60	**90**	**88**	**83**	**82**	**70**
CA27	Euston Road LAQN colocation	Roadside	0.63	-	-	-	-	**63.81**
CA10	Tavistock Gardens	Urban Background	0.68	**44.57**	39.68	**46.18**	35.35	33.13
CA20A (new)	Brill Place	Roadside	0.79	-	-	-	-	**43.13**
CA4A (new)	Euston Road	Kerbside	0.83	-	-	-	-	**69.06**
CA11	Tottenham Court Road*	Kerbside	0.97	**85.61**	**83.57**	**74.04**	**65.75**	**61.22**
B0	London Bloomsbury	Urban Background	1.06	**48**	**42**	38	36	32
CA6	St. George's Gardens (prev. 'Wakefield Gardens')	Urban Background	1.17	35.80	31.31	34.83	26.67	24.65
CA21	Bloomsbury Street	Kerbside	1.24	**71.43**	**72.20**	**71.18**	**59.43**	**48.48**
CA28	St. George's Gardens East	Urban Background	1.24	-	-	-	-	27.67
CTLEN11	Britannia Junction	Kerbside	1.27	-	-	-	-	**52.69**
CTLEN10	Camden High Street (American Candy)	Roadside	1.31	-	-	-	-	**46.58**
CTLEN12	Cavendish School (Arlington Road)	Roadside	1.34	-	-	-	-	33.21
CTLEN9	Camden High Street	Roadside	1.39	-	-	-	-	37.93

Site ID	Site name	Site type	Distance from Proposed Devt. site (km)	Annual mean NO_2 concentration ($\mu g/m^3$)				
				2015	2016	2017	2018	2019
	(Camden News)							
CTLEN5	Kentish Town Road	Roadside	1.44	-	-	-	-	**44.00**
CTLEN7	Jamestown Road	Roadside	1.48	-	-	-	-	37.84
CA23	Camden Road	Kerbside	1.48	**63.33**	**61.74**	**69.30**	**55.57**	**52.49**
CTLEN6	Hawley Crescent	Roadside	1.49	-	-	-	-	38.02
Objective				40				

4.3.2 LBC also undertake monitoring to determine compliance with the annual mean PM_{10} and $PM_{2.5}$ and 24-hour mean PM_{10} AQOs at five automatic monitors. This includes the monitoring currently undertaken at the CD9 and B0 monitoring location.

4.3.3 For the years 2015 to 2019, no breaches of these AQOs were recorded at either the Euston Road or London Bloomsbury monitoring locations. Table 4-2 below presents the hourly mean NO_2 concentrations recorded at these monitors and Swiss Cottage. As is shown, the hourly mean did not exceed 200µg/m^3 on more than the 18 permissible times per annum (i.e. did not breach the hourly mean NO_2 AQO) at any of the monitoring locations during 2018 or 2019. However, the hourly mean NO_2 AQO was breached at CD9 during the years 2015 to 2017, and at CD1 in 2015 and 2016. The number of hours above 200µg/m^3 has generally declined over the last five years at all three locations.

Table 4-2 UK ambient AQOs relevant to the assessment

Site ID	Site name	Site type	Distance from Proposed Devt. site (km)	Number of hourly means >200µg/m^3				
				2015	2016	2017	2018	2019
CD9	Euston Road	Roadside	0.6	**54**	**39**	**25**	18	7
B0	London Bloomsbury	Urban background	1.0	0	0	0	0	0
CD1	Swiss Cottage	Kerbside	3.2	**11**	**37**	1	2	1

Note: Results in **bold** exceeded 200µg/m^3 more than 18 times, meaning that it breached the hourly mean NO_2 AQO.

4.4 HS2 air quality monitoring

4.4.1 Contractors have monitored at and around the Proposed Development site as part of the wider works on Phase One for some years. Table 4-3 below summarises diffusion tube data collected at the monitoring locations within 0.5km of the Proposed Development site for the years 2016 to 2019, the years for which monitoring data are available. The data show that the annual mean NO_2 AQO was above the AQO at many nearby roadside locations, including at the diffusion tube located approximately three metres from Hampstead Road, near the signalised junction between Hampstead and Drummond Street, HS2-000020BMC.

4.4.2 There are three urban background monitors located in the vicinity of the Proposed Development site, where the annual mean NO_2 concentrations were within the AQO during 2019, namely HS2-000020BQ4, HS2-000020BQT and HS2-000020BPX. The annual mean NO_2 concentrations reduced between 2016 and 2019 at these locations, potentially signalling an overall reduction in pollutant concentrations.

4.4.3 The AQO was also met at HS2-000020BQC (on a lamppost near the Hampstead Road/ Robert Street junction), which is located kerbside to Robert Street (a minor road) and set back from Euston Road by circa 11.6 metres.

Table 4-3 Annual mean NO_2 concentrations monitored by HS2 at locations within 0.5km of the Proposed Development site

Site ID	Site name	Site type	Distance from Proposed Devt. site (km)	Annual mean NO_2 concentration (µg/m^3)			
				2016	2017	2018	2019
HS2-000020BQ4	Junction of North Gower Street and Starcross Street	Background	0.06	**43.8**	39.2	37.7	33.2
HS2-000020BQT	Drummond Street	Background	0.10	-	-	-	35.7
HS2-000020BPX	Netley Street	Background	0.12	**41.5**	36.0	35.9	33.2
HS2-000020BQC	Junction of Robert Street and Hampstead Road	Kerbside	0.12	**59.3**	**-**	**-**	36.3
HS2-000020BMC	Hampstead Road	Roadside	0.14	**68.0**	**59.1**	**61.4**	61.5
HS2-000020BMJ	Junction on Robert	Background	0.23	**44.1**	39.1	33.7	29.8

Site ID	Site name	Site type	Distance from Proposed Devt. site (km)	Annual mean NO_2 concentration ($\mu g/m^3$) 2016	2017	2018	2019
	Street and Stanhope Street						
HS2-000020BQB	Junction of Harrington Street and Varndell Street	Background	0.24	**54.1**	-	-	29.0
HS2-000020BMA	Junction of Euston Road and Gower Street	Roadside	0.29	**70.1**	**60.3**	**58.7**	**51.4**
HS2-000020BPY	Stanhope Street	Background	0.39	38.3	32.4	32.2	28.9
HS2-000020BPU	Junction of Gower Street and Grafton Way	Roadside	0.41	**59.7**	**51.5**	**50.5**	**47.6**
HS2-000020BQJ	Grafton Way	Background	0.42	-	-	-	**51.3**
HS2-000020BQD	Drummond Crescent	Background	0.42	**58.7**	-	-	35.3
HS2-000020BM8	Junction of Euston Square and Grafton Place	Roadside	0.44	**66.9**	**58.0**	**59.3**	**56.3**
HS2-000020BMH	Nash Street	Background	0.44	**42.5**	39.5	34.8	30.9
HS2-000020BQ1	Polygon Road	Background	0.50	39.7	35.0	34.0	31.6
HS2-000020BM9	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	0.50	**59.5**	**52.4**	**57.9**	**49.1**
		Objective				40	

4.5 Modelled background concentrations

Defra modelled background concentrations

4.5.1 Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were obtained from maps downloaded from the UK-AIR website maintained by Defra. The maps present

annual mean pollutant concentrations on a 1km^2 basis for the years 2018 to 2030. The concentrations for the 1km x 1km grid square centred on OS coordinates 529500, 182500, corresponding to the location of the Proposed Development, for 2019, 2021 (the year in which construction activities are expected to commence) and 2022 (the year the Proposed Development is expected to be operational) are shown in Table 4-4. The data show that annual mean pollutant concentrations are not expected to breach the annual mean NO_2, PM_{10} or $PM_{2.5}$ AQOs in any of the presented years.

Table 4-4 Background pollutant concentrations at the Proposed Development from the UK-AIR website

Pollutant	2019 (µg/m^3)	2021 (µg/m^3)	2022 (µg/m^3)	Objective
NO_2	39.6	36.4	35.4	40
PM_{10}	20.2	19.3	19.1	40
$PM_{2.5}$	12.9	12.4	12.2	25

London Atmospheric Emissions Inventory modelled concentrations

4.5.2 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ were also obtained from maps downloaded from the London Atmospheric Emissions Inventory, produced on behalf of the Greater London Authority. The maps present annual mean pollutant concentrations for the year 2016, the only year for which data are available. The concentrations for the 20m x 20m grid square centred on OS coordinates 529260, 182640, corresponding to the grid square containing the south-western corner of the façade of the proposed building.

4.5.3 The concentrations, presented in Table 4-5, show that the site is in an area where the annual mean NO_2 AQO was breached in 2016. The annual mean PM_{10} and $PM_{2.5}$ AQOs were not breached.

4.5.4 The 2016 base maps are considered to overestimate prevailing pollutant concentrations at the site during 2021 as local monitoring data have shown a reduction in concentrations.

Table 4-5 Pollutant concentrations from the LAEI at the 529260, 182640 20m grid square in which the Proposed Development is located

Pollutant	2016 (µg/m^3)	Objective
NO_2	48.2	40
PM_{10}	25.1	40
$PM_{2.5}$	15.1	25

4.6 Overall baseline

4.6.1 Based on the monitored and estimated Defra background data presented above, it is considered that the Proposed Development site is located in an area where the PM_{10} and $PM_{2.5}$ AQOs are not likely to be breached.

4.6.2 Data collected by LBC and HS2 Ltd indicate that annual mean NO_2 concentrations may be breached near local A-roads, including Hampstead Road. However, the diffusion tube HS2-000020BQC, located at the junction of Robert Street and Hampstead Road, was 36.3µg/m^3 during 2019, the latest year for which monitoring data are available. The monitoring location is closer to Hampstead Road (c. 12m) than the façade of the Proposed Development site (c. 35m). As pollutant concentrations tend to disperse and dilute with distance from the road, it is considered likely that annual mean NO_2 concentrations are lower than 36.3µg/m^3 at the Proposed Development site.

4.6.3 Monitoring undertaken at HS2-000020BQ4, located at a background location circa 60m from the Proposed Development site, is located circa 60m from Hampstead Road. The annual mean NO_2 concentration at this monitor was 33.2µg/m^3 during 2019. The monitor is further from Hampstead Road than the western façade of the proposed building.

4.6.4 Looking at annual mean NO_2 concentrations overall, it is considered likely that concentrations will have ranged between 33 and 36µg/m^3 NO_2 at site during 2019.

4.6.5 As explained in forthcoming subsections, the dispersion modelling exercise has used the estimated UK-AIR background concentrations and added on the contribution from local roads. Based on the trend showing a reduction in annual mean NO_2 concentrations at background locations around the Proposed Development site with time, it is likely that background pollutant concentrations used in the dispersion modelling assessment (Table B-6) are overly pessimistic.

5 Construction phase assessment

5.1 Construction dust

Step 1: Identify need for detailed assessment

5.1.1 According to the IAQM 2014 guidance, an assessment of construction dust effects is normally required if there are human or ecological receptors within 350m of locations where potentially dusty activities take place on site, or within 50 m of routes expected to be used by construction vehicles on a public highway (where trackout could arise), up to 500 m from the site entrance.

5.1.2 According to the IAQM 2014 guidance, trackout is defined as *'The transport of dust and dirt from the construction/ demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.'*

5.1.3 As there are human receptors within 350m of the boundary of the Proposed Development site, a dust risk assessment was undertaken. There are no ecological receptors within 50m of the Proposed Development site boundary or routes along which trackout could occur, so ecological impacts have therefore been screened out of this assessment.

Step 2A: Define potential dust emission magnitudes

5.1.4 Potential dust emission magnitudes from construction activities associated with the Proposed Development were determined using the IAQM 2014 guidance and are detailed in Appendix A and summarised in Table 5-1.

Table 5-1 Dust emission magnitudes

Construction activity	Dust emission magnitude
Demolition	Not applicable (none proposed)
Earthworks	Small
Construction	Small
Trackout	Small

Step 2B: Define sensitivity of the area

5.1.5 Using the IAQM 2014 guidance, the sensitivity of the surrounding area was determined for dust soiling effects and health effects. This is shown in Table 5-2.

Table 5-2 Sensitivity of the surrounding area

Potential impact	Sensitivity of the surrounding area		
	Earthworks	Construction	Trackout
Dust soiling	Medium	Medium	Medium
Human health	Low	Low	Low

Step 2C: Define the risk of dust impacts

5.1.6 The construction dust risks shown in Table 5-3 were then assigned by considering the dust emission magnitude (shown in Table 5-1) associated with each on-site activity and consideration of the sensitivity of the surrounding area (shown in Table 5-2), in accordance with the IAQM 2014 guidance.

Table 5-3 Summary of the dust risk from Proposed Development site construction related activities

Potential impact	Risk of dust impacts		
	Earthworks	Construction	Trackout
Dust soiling	Low risk	Low risk	Negligible risk
Human health	Negligible risk	Negligible risk	Negligible risk
Ecological	Negligible risk		

5.1.7 The overall dust risk from the Proposed Development site is predicted to be low. The dust risk is predicted to be low for earthworks and construction, and negligible for trackout.

5.1.8 Mitigation measures will help to negate some of the potential negative air quality impacts resulting from the construction phase of the Proposed Development and will avoid significant dust effects. This is further discussed in Section 8-1.

5.2 Construction road traffic emissions

5.2.1 Scenarios 1, 4 and 5 were modelled to represent effects from construction-related activities. Receptors assessed are shown in Figures B-1 to B-3 of Appendix B.

5.2.2 Table 5-4 presents the predicted annual mean NO_2 concentrations at each of the existing receptor locations to which the annual and hourly mean AQOs should be applied in S4 and S5. For those receptors where it is appropriate to apply the annual mean NO_2 AQO, it also shows the percentage change in pollutant concentrations (with the Proposed Development in place) relative to the air quality assessment level (i.e., the annual mean NO_2 AQO), the S5 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance impact descriptor.

5.2.3 For receptors where only the hourly AQO applies, results relevant to annual means are indicated as being not applicable. Table B-3 in Appendix B outlines which AQOs should be applied to each receptor.

5.2.4 Table 5-4 shows that the annual mean NO_2 concentrations are predicted to breach the annual mean NO_2 AQO at all modelled existing receptors in both S4 and S5.

5.2.5 The highest annual mean NO_2 concentration (68.1µg/m^3) at a receptor sensitive to changes in annual mean concentrations is predicted at receptor ER15.

5.2.6 The predicted pollutant concentrations suggest that the Proposed Development would not expose any new existing annual mean sensitive receptors to concentrations in excess of the annual mean NO_2 AQO.

5.2.7 The largest change in annual mean NO_2 concentrations at annual mean sensitive receptors was a 0.1% increase relative to the AQO. As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at each of the relevant modelled receptors.

5.2.8 None of the existing receptors modelled are exposed to annual mean NO_2 concentrations exceeding 60µg/m^3 with the Proposed Development, where they did not already exceed 60µg/m^3 without the Proposed Development. Therefore, the one-hour mean objective is not likely to be breached as a direct result of traffic generated by the Proposed Development.

Table 5-4 Estimated 2021 annual mean NO_2 (µg/m^3) at modelled existing receptors (construction phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method

Receptor ID	Predicted annual mean concentration (µg/m^3)		Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S4	S5			
EC06.G	**53.7**	**53.7**	<0.1	Not applicable	Not applicable
EC08	**46.1**	**46.1**	<0.1	Not applicable	Not applicable
EC12.G	**44.4**	**44.4**	<0.1	Not applicable	Not applicable
ER01	**55.3**	**55.3**	<0.1	138	Negligible
ER02	**52.8**	**52.8**	<0.1	Not applicable	Not applicable
ER06.1	**48.7**	**48.7**	<0.1	122	Negligible
ER11(r)	**49.4**	**49.5**	<0.1	124	Negligible
ER12.1	**42.2**	**42.2**	<0.1	105	Negligible
ER14	**41.3**	**41.3**	<0.1	103	Negligible
ER15	**68.0**	**68.1**	0.1	170	Negligible

Note: Results breaching the annual mean AQO shown in bold; those exceeding the 60µg/m^3 screening criterion indicating when the hourly mean NO_2 AQO may be breached shown underlined. Results marked as 'Not applicable' are not residential properties or

Receptor ID	Predicted annual mean concentration (µg/m³)		Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S4	S5			
hospitals, instead referring to locations where members of the public may be expected to spend one hour or longer. They are therefore not relevant to the annual mean NO_2 AQO and have consequently not been assigned an EUK-IAQM impact descriptor.					

5.2.9 Table 5-5 presents the predicted annual mean PM_{10} concentrations at each of the existing receptor locations to which the annual mean AQOs should be applied in S4 and S5. It also shows the percentage change in pollutant concentrations (with the Proposed Development) relative to the air quality assessment level (i.e. the annual mean PM_{10} AQO), the S5 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance impact descriptor.

5.2.10 Table 5-5 shows that the annual mean PM_{10} concentrations are not predicted to breach the annual mean PM_{10} AQO at any of the modelled receptors in both S2 and S3. The highest annual mean PM_{10} concentration (26.3µg/m^3) was predicted at receptor ER15.

5.2.11 The largest change in annual mean concentrations was <0.1µg/m^3 (a <0.1% increase relative to the AQO). As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at the modelled receptors sensitive to changes in annual mean PM_{10} concentrations.

Table 5-5 Estimated annual mean PM_{10} (µg/m³) at modelled existing receptors (construction phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method in S1, S2 and S3

Receptor ID	Predicted annual mean concentration (µg/m³)		Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S4	S5			
ER01	23.0	23.0	<0.1	58	Negligible
ER06.1	22.3	22.3	<0.1	56	Negligible
ER11(r)	22.9	22.9	<0.1	57	Negligible
ER12.1	21.3	21.3	<0.1	53	Negligible
ER14	21.2	21.2	<0.1	53	Negligible
ER15	26.3	26.3	<0.1	66	Negligible

Note: Results breaching the annual mean AQO shown in bold

5.2.12 Table 5-6 presents the predicted annual mean $PM_{2.5}$ concentrations at each of the existing receptor locations to which the annual mean AQOs should be applied in S4 and S5. It also shows the percentage change in pollutant concentrations (with the scheme) relative to the air quality assessment level (i.e. the annual mean $PM_{2.5}$ AQO), the S5 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance impact descriptor.

5.2.13 It shows that the annual mean $PM_{2.5}$ concentrations are not predicted to breach the annual mean $PM_{2.5}$ AQO at any of the relevant modelled receptors in both S2 and S3. The highest annual mean $PM_{2.5}$ concentration (16.6µg/m³) is predicted at receptor ER15.

5.2.14 The largest change in annual mean concentrations was <0.1µg/m³ (a <0.1% increase relative to the AQO). As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at the relevant modelled receptors.

Table 5-6 Estimated annual mean $PM_{2.5}$ (µg/m³) at modelled existing receptors (construction phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method in S1, S2 and S3

Receptor ID	Predicted annual mean concentration (µg/m³)		Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S4	S5			
ER01	14.6	14.6	<0.1	58	Negligible
ER06.1	14.2	14.2	<0.1	57	Negligible
ER11(r)	14.5	14.5	<0.1	58	Negligible
ER12.1	13.6	13.6	<0.1	54	Negligible
ER14	13.5	13.5	<0.1	54	Negligible
ER15	16.6	16.6	<0.1	66	Negligible

Note: Results breaching the annual mean AQO shown in bold.

5.2.15 Table 5-7 below presents the change in the number of days where the 24-hour mean PM_{10} AQO is expected to exceed 50µg/m^{-3} in S4 and S5. As there is no change in the number of days where receptors are exposed to concentrations exceeding 50µg/m^{-3} between S4 and S5, road traffic attributable to the operation of the Proposed Development is not considered to have a significant effect on air quality at existing receptor locations.

Table 5-7 Estimated 24-hour mean PM_{10} (µg/m³) at modelled existing receptors (construction phase) in S4 and S5

Receptor ID	Estimated number of days per annum where 24-hour mean concentration exceeds 50µg/m³	
	S4	S5
EC06.G	9	9
EC08	7	7
EC12.G	6	6
ER01	8	8
ER02	8	8
ER06.1	7	7
ER11(r)	8	8
ER12.1	5	5
ER14	5	5
ER15	16	16

Note: Results breaching the 24-hour mean AQO (i.e. where number of days per annum exceeding 50µg/m³) shown in bold.

5.2.16 Based on the EPUK-IAQM guidance, the change in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations associated with operation of the Proposed Development

results in the air quality impact being classified as negligible for all modelled receptors. Moreover, the Proposed Development does not expose any additional existing receptors to concentrations of the hourly mean NO_2 or 24-hour mean AQOs breaching the AQO where they were not predicted to without the development in place.

5.2.17 For these reasons, the effect of road traffic associated with operation of the Proposed Development on local air quality is considered to be not significant.

6 Operational phase

6.1 Impacts of the Proposed Development

6.1.1 Receptors assessed are shown in Figures B-1 to B-3 of Appendix B.

6.1.2 Table 6-1 presents the predicted annual mean NO_2 concentrations at each of the existing receptor locations to which the annual and hourly mean AQOs should be applied in S1, S2 and S3. For those receptors where it is appropriate to apply the annual mean NO_2 AQO, it also shows the percentage change in pollutant concentrations (with the in place) relative to the air quality assessment level (i.e., the annual mean NO_2 AQO) between S2 and S3, the S3 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance impact descriptor. Those receptors where the annual mean NO_2 AQO does not apply is denoted by a '-'.

6.1.3 It shows that the annual mean NO_2 concentrations are predicted to breach the annual mean NO_2 AQO at all modelled existing receptors in both S2 and S3.

6.1.4 The highest annual mean NO_2 concentration (68.4µg/m^3) at a receptor sensitive to changes in annual mean concentrations is predicted at receptor ER15 located at the existing residential façade along Hampstead Road, near the signalised junction with Drummond Street. The predicted pollutant concentrations therefore suggest that the Proposed Development would not expose any new existing annual mean sensitive receptors to concentrations in excess of the annual mean NO_2 AQO.

6.1.5 The largest change in annual mean NO_2 concentrations was less than 0.1% increase relative to the AQO at each of the annual mean sensitive receptors. As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at the modelled receptors.

Table 6-1 Estimated 2022 annual mean NO_2 (µg/m^3) at modelled existing receptors (operational phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method

Receptor ID	Predicted annual mean concentration (µg/m^3)			Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S1 Base Case	S2 Without Development	S3 With Development			
EC06.G	**53.7**	**53.9**	**53.9**	<0.1	135	Negligible
EC08	**45.9**	**46.3**	**46.3**	<0.1	116	Negligible
EC12.G	**44.2**	**44.5**	**44.5**	<0.1	111	Negligible

Receptor ID	Predicted annual mean concentration (µg/m³)			Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S1 Base Case	S2 Without Development	S3 With Development			
ER01	**54.8**	**55.5**	**55.5**	<0.1	139	Negligible
ER02	**52.4**	**53.0**	**53.0**	<0.1	133	Negligible
ER06.1	**48.7**	**48.8**	**48.9**	<0.1	122	Negligible
ER11(r)	**49.1**	**49.6**	**49.6**	<0.1	124	Negligible
ER12.1	**42.0**	**42.3**	**42.3**	<0.1	106	Negligible
ER14	**41.1**	**41.4**	**41.4**	<0.1	103	Negligible
ER15	**53.4**	**68.4**	**68.4**	<0.1	171	Negligible

Note: Results breaching the annual mean AQO shown in **bold**; those exceeding the 60µg/m³ screening criterion indicating when the hourly mean NO_2 AQO may be breached shown underlined.

6.1.6 Table 6-2 presents the predicted annual mean PM_{10} concentrations at each of the existing receptor locations to which the annual mean AQOs should be applied in S1, S2 and S3. It also shows the percentage change in pollutant concentrations (with the Proposed Development in place) relative to the air quality assessment level (i.e. the annual mean PM_{10} AQO) in S2 and S3, the S3 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance descriptor.

6.1.7 Annual mean PM_{10} concentrations are not predicted to breach the annual mean PM_{10} AQO at any of the modelled receptors in both S2 and S3. The highest annual mean PM_{10} concentration (26.4µg/m³) is predicted at receptor ER15.

6.1.8 The largest change in annual mean concentrations was <0.1µg/m³ (a <0.1% increase relative to the AQO). As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at the modelled receptors sensitive to changes in annual mean PM_{10} concentrations.

Table 6-2 Estimated annual mean PM_{10} (µg/m³) at modelled existing receptors (operational phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method in S1, S2 and S3

Receptor ID	Predicted annual mean concentration (µg/m³)			Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S1 base case	S2 without development	S3 with development			
ER01	22.9	23.0	23.1	<0.1	58	Negligible
ER06.1	22.3	22.4	22.4	<0.1	56	Negligible
ER11(r)	22.9	23.0	23.0	<0.1	57	Negligible
ER12.1	21.9	21.3	21.3	<0.1	53	Negligible
ER14	21.2	21.2	21.3	<0.1	53	Negligible
ER15	23.3	26.3	26.4	<0.1	66	Negligible

Note: Results breaching the annual mean AQO shown in bold.

6.1.9 Table 6-3 presents the predicted annual mean $PM_{2.5}$ concentrations at each of the existing receptor locations to which the annual mean AQOs should be applied in S1, S2 and S3. It also shows the percentage change in pollutant concentrations (with the Proposed Development in place) relative to the air quality assessment level (i.e. the annual mean $PM_{2.5}$ AQO) and the S3 pollutant concentration as a percentage of the air quality assessment level, and the assigned EPUK-IAQM guidance descriptor.

6.1.10 It shows that the annual mean $PM_{2.5}$ concentrations are not predicted to breach the annual mean $PM_{2.5}$ AQO at any of the relevant modelled receptors in both S2 and S3. The highest annual mean $PM_{2.5}$ concentration (16.6µg/m³) is predicted at receptor ER15.

6.1.11 The largest change in annual mean concentrations was <0.1µg/m³ (a <0.1% increase relative to the AQO). As per the EPUK-IAQM guidance assessment method, the impact of the Proposed Development on air quality was assessed as negligible at the relevant modelled receptors.

Table 6-3 Estimated annual mean $PM_{2.5}$ (µg/m^3) at modelled existing receptors (operational phase) and assessment of impact magnitude in accordance with the EPUK-IAQM guidance method in S1, S2 and S3

Receptor ID	Predicted annual mean concentration (µg/m3)			Percentage change in concentration relative to air quality assessment level	% of air quality assessment level	EPUK-IAQM impact descriptor
	S1 base case	S2 without development	S3 with development			
ER01	14.6	14.6	14.6	<0.1	59	Negligible
ER06.1	14.2	14.2	14.2	<0.1	57	Negligible
ER11(r)	14.5	14.5	14.5	<0.1	58	Negligible
ER12.1	13.5	13.6	13.6	<0.1	54	Negligible
ER14	13.4	13.5	13.5	<0.1	54	Negligible
ER15	14.7	16.6	16.6	<0.1	67	Negligible

Note: Results breaching the annual mean AQO shown in bold.

6.1.12 Table 6-4 below presents the change in the number of days where 24-hour mean PM_{10} concentrations above 50µg/m^{-3} in S1, S2 and S3. As there is no change in the number of days where receptors are exposed to concentrations above 50µg/m^{-3} between S2 and S3, road traffic attributable to the operation of the Proposed Development is not considered to have a significant effect on air quality at existing receptor locations.

Table 6-4 Estimated 24-hour mean PM_{10} (µg/m^3) at modelled existing receptors (operational phase) in S1, S2 and S3

Receptor ID	Estimated number of days where 24-hour mean concentration exceeds the AQO (µg/m^3)		
	S1 Base Case	S2 Without Development	S3 With Development
ER01	8	8	8
ER06.1	7	7	7
ER11(r)	8	8	8
ER12.1	5	5	5
ER14	5	5	5
ER15	9	16	16

Note: Results breaching the 24-hour mean AQO (i.e. where number of days per annum exceeding 50µg/m^{-3}) shown in bold.

6.1.13 Based on the EPUK-IAQM guidance, the change in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations associated with operation of the Proposed Development results in the air quality impact being classified as negligible for all modelled receptors. Moreover, the Proposed Development does not expose any additional existing receptors to concentrations of the hourly mean NO_2 or 24-hour mean

AQOs breaching the AQO where they were not predicted to without the Proposed Development in place.

6.1.14 For these reasons, the effect of road traffic associated with operation of the Proposed Development on local air quality is considered to be not significant.

6.2 Impacts on future receptors introduced by the Proposed Development

6.2.1 An assessment on office worker receptors was undertaken, although this was to inform the mechanical ventilation strategy only. This is because receptors at the facades of the office are workers, where exposure to poor air quality is covered by the Health and Safety at Work Act (as opposed to ambient air quality legislation establishing the AQOs). The result of the assessment in S3 are summarised in Table 6-5.

6.2.2 Annual mean PM_{10} and $PM_{2.5}$ concentrations are not predicted to breach the AQOs at any assessed new receptors within the Proposed Development once it is fully operational. The number of days when the daily mean PM_{10} standard is calculated to be breached was within the 35 permissible days per annum. The annual mean NO_2 AQO was also below 60µg/m^3 at all modelled receptor locations, indicating that the hourly mean NO_2 AQO is not likely to be breached at the Proposed Development site.

6.2.3 Annual mean NO_2 concentrations are predicted to breach the annual mean NO_2 AQO at receptors DR01 to DR04, although DR03 is not located at the façade. The locations breaching the AQO, 38µg/m^3 and 42µg/m^3 are shown in Figure 6-1.

6.2.4 The results presented here are considered highly conservative, as they do not take into account any predicted future reduction in background pollutant concentrations or vehicle emissions factors, including after October 2021 when the Proposed Development site is expected to be included within the expanded ULEZ. It is anticipated, therefore, that the Proposed Development site would be lower than presented in practice and may not actually breach the annual mean NO_2 AQO.

6.2.5 Annual mean PM_{10} and $PM_{2.5}$ concentrations breach the WHO guideline values, but 2019 background concentrations alone breach WHO guideline values for PM_{10} and $PM_{2.5}$.

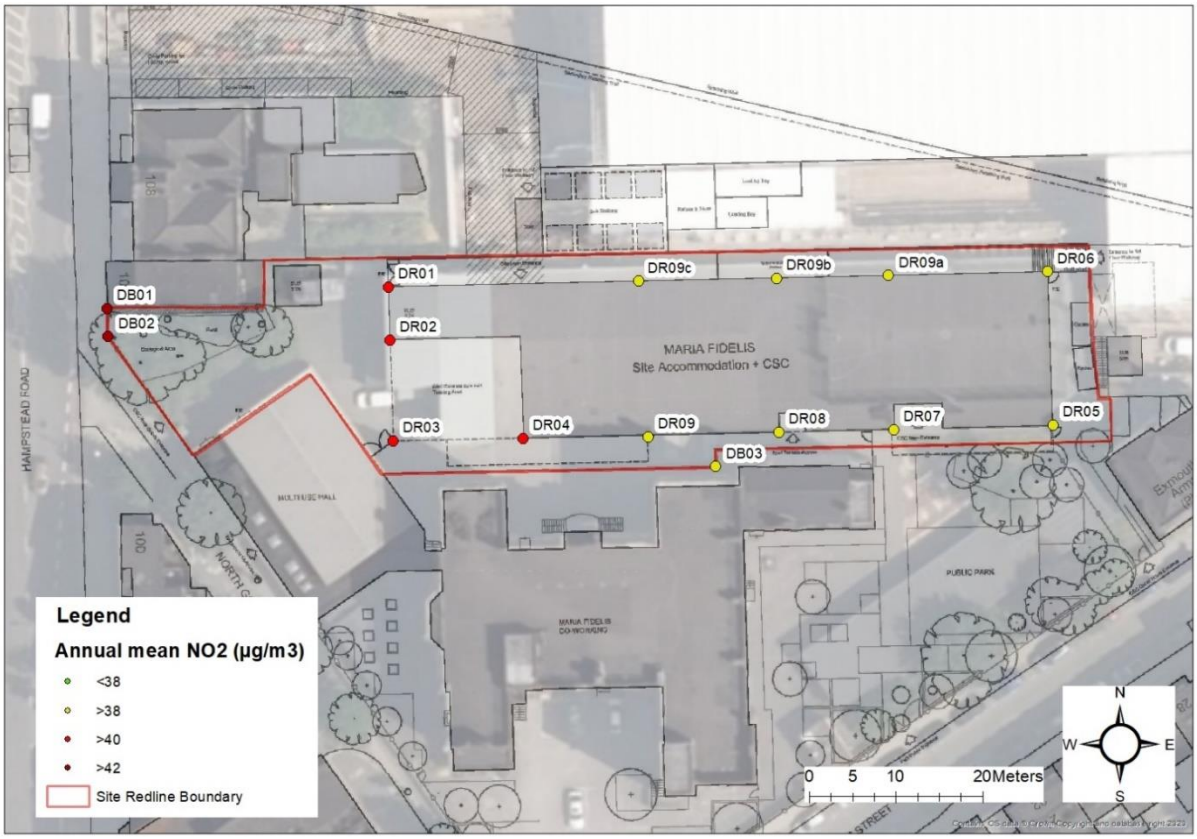
Table 6-5 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at new receptors for S3

Receptor ID	Height (m)	S3 With Proposed Development 2022				APEC category
		Annual mean NO_2	Annual mean PM_{10}	Annual mean $PM_{2.5}$	No. days per annum where daily mean PM_{10} AQO exceeded	
DB01	1.5	**50.2**	23.1	14.6	8	N/A (not CSC facade)
DB02	1.5	**50.1**	23.1	14.6	8	N/A (not CSC facade)
DB03	1.5	39.6	20.8	13.3	4	N/A (not CSC facade)
DR01	1.5	**41.2**	21.2	13.5	5	APEC-B
DR02	1.5	**41.2**	21.2	13.5	5	APEC-B
DR03	1.5	**41.3**	21.2	13.5	5	N/A (not CSC facade)
DR04	1.5	**40.3**	21.0	13.3	5	APEC-B
DR05	1.5	39.0	20.7	13.2	4	APEC-B
DR06	1.5	38.8	20.7	13.2	4	APEC-B
DR07	1.5	39.2	20.7	13.2	4	APEC-B
DR08	1.5	39.4	20.8	13.2	4	APEC-B
DR09	1.5	39.8	20.9	13.3	5	APEC-B
DR09a	1.5	39.1	20.7	13.2	4	APEC-B
DR09b	1.5	39.3	20.8	13.2	4	APEC-B
DR09c	1.5	39.7	20.8	13.3	5	APEC-B
DR11	5.475	**40.6**	21.0	13.4	5	N/A (not CSC facade)
DR12	5.475	**40.6**	21.0	13.4	5	N/A (not CSC facade)
DR13	5.475	**40.6**	21.0	13.4	5	
DR14	5.475	40.0	20.9	13.3	5	
DR15	5.475	38.9	20.7	13.2	4	APEC-B
DR16	5.475	38.8	20.7	13.2	4	
DR17	5.475	39.1	20.7	13.2	4	
DR18	5.475	39.2	20.8	13.2	4	N/A (not CSC facade)
DR19	5.475	39.5	20.8	13.3	4	
DR19a	5.475	38.9	20.7	13.2	4	APEC-B
DR19b	5.475	39.1	20.7	13.2	4	N/A (not CSC facade)
DR19c	5.475	39.4	20.8	13.2	4	
DR21	8.47	39.8	20.9	13.3	5	
DR22	8.47	39.8	20.9	13.3	5	
DR23	8.47	39.9	20.9	13.3	5	
DR24	8.47	39.5	20.8	13.3	4	

Receptor ID	Height (m)	S3 With Proposed Development 2022				APEC category
		Annual mean NO_2	Annual mean PM_{10}	Annual mean $PM_{2.5}$	No. days per annum where daily mean PM_{10} AQO exceeded	
DR25	8.47	38.8	20.7	13.2	4	
DR26	8.47	38.6	20.6	13.1	4	
DR27	8.47	38.9	20.7	13.2	4	
DR28	8.47	39.0	20.7	13.2	4	
DR29	8.47	39.2	20.8	13.2	4	
DR29a	8.47	38.8	20.7	13.2	4	
DR29b	8.47	38.9	20.7	13.2	4	
DR29c	8.47	39.1	20.7	13.2	4	
DR31	12.405	38.8	20.7	13.2	4	
DR32	12.405	38.9	20.7	13.2	4	
DR33	12.405	38.9	20.7	13.2	4	
DR34	12.405	38.8	20.7	13.2	4	
DR35	12.405	38.5	20.6	13.1	4	
DR36	12.405	38.4	20.6	13.1	4	
DR37	12.405	38.6	20.6	13.1	4	
DR38	12.405	38.6	20.6	13.2	4	
DR39	12.405	38.7	20.7	13.2	4	
DR39a	12.405	38.5	20.6	13.1	4	
DR39b	12.405	38.5	20.6	13.1	4	
DR39c	12.405	38.6	20.7	13.2	4	
DR41	15.87	38.1	20.6	13.1	4	
DR42	15.87	38.1	20.6	13.1	4	
DR43	15.87	38.2	20.6	13.1	4	
DR44	15.87	38.3	20.6	13.1	4	
DR45	15.87	38.2	20.6	13.1	4	
DR46	15.87	38.1	20.6	13.1	4	
DR47	15.87	38.3	20.6	13.1	4	
DR48	15.87	38.3	20.6	13.1	4	
DR49	15.87	38.3	20.6	13.1	4	
DR49a	15.87	38.2	20.6	13.1	4	
DR49b	15.87	38.2	20.6	13.1	4	
DR49c	15.87	38.2	20.6	13.1	4	
DR51	19.335	37.6	20.5	13.0	4	

Receptor ID	Height (m)	S3 With Proposed Development 2022				APEC category
		Annual mean NO_2	Annual mean PM_{10}	Annual mean $PM_{2.5}$	No. days per annum where daily mean PM_{10} AQO exceeded	
DR52	19.335	37.6	20.5	13.0	4	
DR53	19.335	37.7	20.5	13.0	4	
DR54	19.335	37.8	20.5	13.1	4	
DR55	19.335	38.0	20.5	13.1	4	
DR56	19.335	37.9	20.5	13.1	4	
DR57	19.335	37.9	20.5	13.1	4	
DR58	19.335	37.9	20.5	13.1	4	
DR59	19.335	37.9	20.5	13.1	4	
DR59a	19.335	37.9	20.5	13.1	4	
DR59b	19.335	37.8	20.5	13.1	4	
DR59c	19.335	37.8	20.5	13.1	4	

Figure 6-1 Receptor locations at ground floor of site where annual mean NO_2, PM_{10} and $PM_{2.5}$ AQOs are exceeded and their APEC category



6.3 Air quality neutral assessment

Building emissions

6.3.1 Max Fordham, the mechanical engineers for the project, advised that all the plant for space heating and hot water will be electrically powered. The building can be considered air quality neutral from a building emissions perspective.

Transport emissions

6.3.2 The benchmarked nitrogen oxides (NO_x, a compound which reacts with ozone in the air to form NO_2) and PM_{10} emissions for the development were calculated by multiplying the gross internal floor area of different components of the Proposed Development by the Transport Emissions Benchmark (TEB) provided in the GLA Air-Quality-Neutral guidance for a B1 (office) development. In the absence of a TEB specifically relating to the CSC or the HS2 accommodation cafeteria, the B1 (office) benchmarks have been applied to the entire Proposed Development

footprint. Table 6-6 summarises the benchmarked emissions for the Proposed Development.

6.3.3 The calculated transport emissions were calculated by multiplying the gross annual average daily traffic (AADT) flows per annum, by the average distance travelled and NO_x and PM_{10} emissions factors for a site in the Central Activities Zone (as provided in the GLA Air-Quality-Neutral guidance). Table 6-7 summarises the calculated transport emissions for the Proposed Development.

Table 6-6 Transport Emissions Benchmark (TEB) calculated from gross internal area

Description	Land Use	GIA (m2)	TEB (g NOx/ m^2/ annum)	TEB (g PM_{10}/ m^2/ annum)	Benchmarked NO_x emissions for the Proposed Development (kg/ annum)	Benchmarked PM_{10} emissions for the Proposed Development (kg/ annum)
HS2 office accommodation	B1	5747	1.27	0.22	7.21	1.26
CSC	B1	1378	1.27	0.22	1.75	0.30
Total					**9.05**	**1.57**

Table 6-7 Calculated transport emissions for the Proposed Development

Description	Land Use	AADT	Average distance travelled (km)	Emissions factor (g/km)		Calculated transport emissions (kg/ annum)	
				NOx	PM_{10}	NOx	PM_{10}
HS2 office accommodation	B1	17	3	0.42	0.07	7.86	1.36
CSC	B1	2	3	0.42	0.07	0.93	0.16
Total				**8.78**		**1.52**	

6.3.4 The calculated transport emissions for the Proposed Development are within the benchmarked emissions. Therefore, the transport emissions meet the air quality neutral requirement.

6.4 Odour risk assessment

6.4.1 See Table 3-4 for details of odour risk scoring.

6.4.2 The project building services engineer confirmed that the kitchen exhaust will terminate 1m above other plant on the flat roof. Dispersion will be good, giving a risk score of 5.

6.4.3 The exact location of the kitchen exhaust and the building ventilation intake had not been specified at the time of the assessment. It was assumed, as a worst case, that the closest sensitive receptors will be within 20m. Receptors could therefore be close, giving a risk score of 10.

6.4.4 The catering unit will have capacity for more than 100 covers. The kitchen size will be large, giving a risk score of 5.

6.4.5 The food to be served has not yet been determined. To cover all possible food types, it was assumed that odour and grease loading will be very high, giving a risk score of 10.

6.4.6 The total risk score of 30 indicates a high impact risk, requiring a high level of odour control.

7 Evaluation of assessment results

7.1 Construction impacts

Construction dust

7.1.1 Mitigation measures will help to negate some of the potentially adverse dust and PM_{10} impacts resulting from the construction phase of the Proposed Development. The implementation of the mitigation measures defined in Section 8.1 will avoid significant dust effects.

Traffic emissions

7.1.2 As outlined in Section 5, an assessment of the air quality impacts attributed to construction traffic associated with the Proposed Development was conducted.

7.1.3 The impacts from construction-related traffic have been assessed and found to be negligible. Therefore, construction of the Proposed Development is not expected to have significant adverse effects on local air quality and impacts are expected to remain negligible in the absence of mitigation. Emissions standards are also in place for HS2 construction vehicles and NRMM, as detailed in Air Quality Information Paper E31 and the HS2 CoCP.

7.2 Operational impacts

Impacts of the Proposed Development

7.2.1 The impacts from operational traffic have been assessed and found to be negligible. Emissions from operational road traffic are also not expected to increase the number of modelled receptors exposed to any breaches of the annual mean NO_2, PM_{10} and $PM_{2.5}$, hourly mean NO_2 or 24-hour mean PM_{10} AQOs. Background PM_{10} and $PM_{2.5}$ concentrations breach the WHO guideline values and therefore these guidelines have not been considered further.

7.2.2 The Proposed Development is not expected to have significant adverse effects on local air quality and impacts are expected to be negligible without mitigation.

Impacts on future receptors

7.2.3 The Proposed Development is predicted to expose future users of the CSC to annual mean NO_2 concentrations in excess of 38µg/m^3, leading to the receptors modelled at the facades of the CSC to be classified as APEC-B or APEC-C. Future ambient air quality is therefore assessed as having a potentially significant effect on future users of the Proposed Development in the absence of mitigation. Mitigation measures have been recommended in Section 8.

7.2.4 Background PM_{10} and $PM_{2.5}$ concentrations breach the WHO guideline values and therefore these guidelines have not been considered further.

Odour risk impacts

7.2.5 In order to avoid unacceptable odour impacts, a high level of odour control will be required.

8 Mitigation

8.1 Mitigation of construction dust

8.1.1 Under best practice guidance, the Proposed Development will constitute a low risk for construction dust. The use of appropriate mitigation measures throughout the construction period will ensure that impacts to sensitive receptors are minimised.

8.1.2 The Proposed Development will comply with the requirements of the HS2 CoCP consented for Phase 1 of the main HS2 works.

8.1.3 The CoCP contains mitigation measures to suppress dust from construction-related activities and control emissions from non-road mobile machinery (plant). Based on the risk of dust impacts identified above, relevant measures from the Dust and Emissions SPG will be implemented and incorporated into the Construction Management Plan (reference: 1CP01-MDS-CL-PLN-SS08_SL20_GF-000003). Since the CoCP requires consideration of best practice guidance, none of the mitigation measures below is in addition to CoCP requirements.

8.1.4 It is advised that highly recommended and desirable measures (shown in italics below) from the Dust and Emissions SPG are implemented.

Site management

- A Construction Working Group is to be established, as specified in the Construction Management Plan
- Display the name and contact details of person(s) accountable for air quality and dust issues on the Proposed Development site boundary
- Display the head or regional office contact information
- Record and respond to all dust and air quality pollutant emissions complaints
- Make the complaints log available to the local authority when asked
- Carry out regular inspections at the Proposed Development site 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 inspections at the Proposed Development site by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the logbook

Preparing and maintaining the Proposed Development site

- Plan the Proposed Development site layout so that machinery and dust-causing activities are located away from receptors, as far as possible

- Erect solid screens or barriers around dusty activities or the Proposed Development site boundary that are at least as high as any stockpiles on site
- *Fully enclose the Proposed Development site or specific operations where there is a high potential for dust production and the site is active for an extensive period*
- Avoid runoff of water or mud from the Proposed Development site
- *Keep fencing, barriers and scaffolding clean using wet methods at the Proposed Development site*
- *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 [unless alternative practices are undertaken as described in the 'Measures Specific to Earthworks' below]

Operating vehicles/ machinery and sustainable travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone
- 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 possible
- *Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes and work areas*

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 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

Waste management

- Avoid bonfires and burning of waste materials
- Reuse and recycle wate to reduce dust from waste materials

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.*

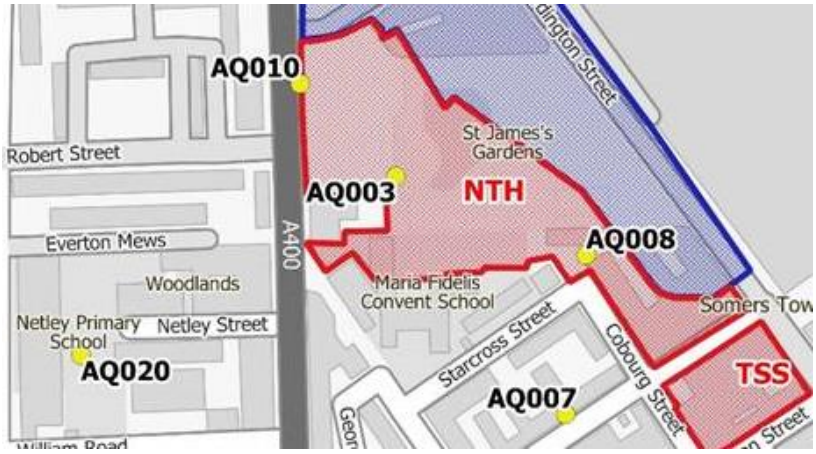
8.1.5 In addition to the measures above, the Construction Management Plan states, "*The main site compound and internal haul road does include a contained wheel*

wash with silt buster waste filtration. All vehicles that pass through the main HS2 site on the concrete haul road will use that wheel wash. Any vehicles that utilise the site access gate at the end of Cobourg Street will have their wheels washed using a localised jet wash when appropriate. Wastewater from this operation will be contained and disposed of in accordance with trade effluent requirements/ agreements."

8.1.6 It also states that "*For any vehicles that are unable to use the [wheel wash] facility due to size, tyres will be jet washed prior to the vehicle leaving site."* Such measures should maintain the negligible dust risk from trackout.

8.1.7 No continuous monitoring is required, given the low dust risk. The site is also close to five nephelometer monitors already in place as part of the Euston Station works. These are shown in Figure 8-1 below.

Figure 8-1 Monitoring locations connected to existing HS2 Euston Station construction site



Source: Construction Management Plan (MDjv, 2021)

8.1.8 With the proposed construction mitigation measures in place, the likely residual impact of works undertaken during the construction phase on local air quality can be considered as 'not significant'.

8.1.9 Due to the extremely limited number of additional daily vehicle movements generated during the construction phase of the Proposed Development, and the short construction timeframe (circa 11 months), there is limited scope to implement mitigation measures to reduce its effects on air quality while undergoing construction. Measures have therefore not considered necessary and are not specifically recommended. However, construction logistics measures are proposed (see the Construction Management Plan), to reduce the likelihood of goods and workers arriving in single-occupancy vehicles where this is practicable.

8.1.10 Non-road mobile machinery will comply with the standards in the HS2 Code of Construction Practice.

8.2 Mitigation measures for the operational phase

8.2.1 The Proposed Development is not expected to have significant adverse effects on air quality and is not expected to attract any vehicle movements (other than delivery movements) once Operational. The Proposed Development has also been assessed as air quality neutral (based on gross vehicle movements). The plant proposed for use at the Proposed Development site are also all-electric, meaning that it meets the air quality neutral benchmarks from a building emissions perspective. Consequently, it is not considered that on-site measures to mitigate any residual air quality effects attributable to the delivery service vehicle movements on air quality at existing receptor locations are practicable and no mitigation measures have been proposed.

8.2.2 However, some of the modelled on-site receptors are predicted to be introduced into an area where annual mean NO_2 concentrations are predicted, using the pessimistic assumptions required by LBC guidance, to be either marginally below or marginally above the AQO (i.e. in APEC category B).

8.2.3 The London Councils guidance suggests that, for an APEC-B receptor, there *'May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.'*

8.2.4 It should be noted that due to the aforementioned conservative background pollutant concentrations and vehicle emissions factors, the number of receptors classified as APEC-B is likely to be a substantial overestimate.

8.2.5 Mitigation measures have been incorporated to control exposure to pollutants, in line with APEC-B requirements. Max Fordham, the mechanical engineers for the Proposed Development site, indicated that the building will be mechanically ventilated. The inlet to the proposed mechanical ventilation system is at roof level (circa 22m above ground level). All occupied spaces in the CSC will be mechanically ventilated. Some windows may be openable, but can be kept locked shut except for building maintenance.

8.2.6 Based on the modelled annual mean NO_2 concentrations presented in Table 6-5, air quality at 19.3m above ground level, modelled to approximately accord with 'breathing height' at fifth floor level, ambient air quality would not exceed 38µg/m^3. As annual mean NO_2 concentrations were shown to decrease with

height, breaches of the annual mean NO_2 AQO (40µg/m^3) above fifth floor level are not expected. Consequently, no air filtration (NOx, PM_{10}, etc.) is required.

8.2.7 Following the implementation of mitigation measures, future users of the Proposed Development site are not expected to be exposed to poor ambient air quality, and therefore the effects of poor ambient air quality on future users would be not significant.

8.3 Mitigation of odour impacts

8.3.1 It is recommended that odour control in the kitchen flue comprise fine filtration or electrostatic precipitation followed by carbon filtration (with a 0.2-0.4 second residence time) or a suitable ultraviolet ozone system. This represents a high level of odour control, commensurate with the risk, and is consistent with withdrawn Defra guidance.

9 Conclusions

9.1.1 This assessment has determined the following:

- The assessment of air quality for construction traffic has determined that there will be a negligible impact on air quality from construction traffic and therefore its effect will not be significant.
- The dust risk assessment has identified that construction activities pose a low dust risk. With the implementation of the mitigation measures detailed in Section 8, the activities are not anticipated to result in significant effects on local receptors.
- The assessment of air quality for operational traffic has determined that there will be a negligible impact on air quality at nearby existing sensitive receptors and therefore its effect will not be significant.
- The assessment for road traffic and combustion plant has determined that future receptors within the Proposed Development could potentially be exposed to concentrations in excess of the annual mean objective for NO_2. However, with the implementation of the mitigation measures detailed in Section 8, the receptors will not be introduced into areas breaching air quality objectives.
- The Proposed Development has been assessed as air quality neutral.
- The odour risk assessment found the Proposed Development to pose a high risk of impacts without mitigation. The mitigation proposed is expected to control odour risk.

9.1.2 The proposed development therefore does not pose a significant risk to air quality.

Appendix A: Construction Phase Assessment

Construction phase dust assessment method

The qualitative construction dust and PM_{10} risk assessment method outlined in the IAQM 2014 guidance and Dust and Emissions SPG is summarised below.

Step 1: Identify the need for a detailed assessment

An assessment would normally be required where there is:

- a human receptor within 350 metres of the proposed scheme; and/or within 50 metres of the access route(s) used by the construction vehicles on the public highway up to 500 metres from the study area site entrance(s); and/or
- an ecological receptor within 50 metres of the proposed scheme and/or within 50 metres of the access route(s) used by construction vehicles on the public highway up to 500 metres from the entrance(s).
- A human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust-soiling, or exposure to PM_{10} over a period relevant to the ambient AQOs.

An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a National Nature Reserve, Ramsar site, Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) or Special Protection Areas (SPA), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate, such as a Site of Importance for Nature Conservation.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects would be 'not significant'.

Step 2: Assess the risk of dust impacts

A site is allocated a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the allocation of mitigation measures. Risks are described as low, medium or high for each of the four separate activities (demolition, construction, earthworks and trackout). Site-specific mitigation is required, proportionate to the level of risk.

Step 2A: Define the potential dust emission magnitude

The potential dust emission magnitude is based on the scale of the anticipated works and should be classified as small, medium or large. Table A-1 presents the dust emission criteria outlined for each construction activity.

Table A-1 Potential dust emission magnitude criteria

Construction activity	Large	Medium	Small
Demolition	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.	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level.	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	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to 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.	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.	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 <20,000 tonnes, earthworks during wetter months.
Construction	Total building volume >100,000 m^3, on site concrete batching, sandblasting.	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	>50 HDV (>3.5 t) outward movements [a] in any one day [b], potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.	10-50 HDV (>3.5 t) outward movements [a] in any one day [b], moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.	<10 HDV (>3.5 t) outward movements [a] in any one day [b], surface material with low potential for dust release, unpaved road length <50 m.

a. A vehicle movement is a one way journey. i.e. from A to B and excludes the return journey.
b. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

Step 2B Define the sensitivity of the area

The sensitivity of the area is described as low, medium or high. It takes into account a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;

- the local background PM_{10} concentrations; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Table A-2 presents indicative examples of classification groups for the varying sensitivities of people to dust soiling effects and to the health effects of PM_{10}; and the sensitivities of receptors to ecological effects. A judgement is made at the site-specific level where sensitivities may be higher or lower, for example a soft fruit business may be more sensitive to soiling than an alternative industry in the same location. Box 6, Box 7 and Box 8 within the IAQM guidance. Table A-2 outlines more detailed information on defining sensitivity.

Table A-2 Indicative examples of the sensitivity of different types of receptors

Sensitivity of receptor	Sensitivities of people and ecological receptors		
	Dust soiling effects[a]	**Health effects of PM_{10}[b]**	**Ecological effects[c]**
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Residential properties, hospitals, schools and residential care homes.	Locations with an international or national designation and the designated features may be affected by dust soiling (e.g. SAC/SPA/Ramsar). Locations where there is a community of a species particularly sensitive to dust such as vascular species included in the Red Data list for Great Britain.
Medium	Parks, places of work.	Office and shop workers not occupationally exposed to PM10.	Locations where there is a particularly important plant species, where dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition (e.g. SSSIs).
Low	Playing fields, farmland, footpaths, short-term car parks and roads.	Public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition (e.g. Local Nature Reserves).

a. People's expectations would vary depending on the existing dust deposition in the area.
b. This follows the Department for Environment, Food and Rural Affairs (Defra, 2016) guidance as set out in Local Air Quality Management Technical Guidance (LAQM.TG (16)). Notwithstanding the fact that the ambient AQOs and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.
c. Only if there are habitats that might be sensitive to dust. A Habitat Regulation Assessment of the site may be required as part of the planning process if the site lies close to an internationally designated site i.e. SACs, SPAs and Ramsar sites.

The IAQM 2014 guidance and Dust and Emissions SPG advise consideration of the risk associated with the nearest receptors to construction activities.

The sensitivity and distance of receptors from the source of dust (i.e. demolition activities, earthworks, etc.) are then used to determine the potential dust risk for each dust effect for each construction activity as shown in Table A-3, Table A-4 and Table A-5. It is noted that distances are to the dust source and so a different area may be affected by trackout than by on-site works.

For trackout, the distances should be measured from the side of the roads used by construction HDVs. Without site specific mitigation, trackout may occur from roads up to 500 metres from large sites, 200 metres from medium sites and 50 metres from small sites, as measured from the site exit. The impact declines with distance from the site. It is only necessary to consider trackout impacts up to 50 metres from the edge of the road.

Table A-3 Sensitivity of the area to dust soiling effects on people and property [a]

Receptor area sensitivity	Number of Receptors [b]	Distance from the Source (m)			
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

a. Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20 metres of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 metres is 102. The sensitivity of the area in this case would be high.

b. Exact counting of number of human receptors not required. It is instead recommended that judgement is used to determine the approximate number of receptors within each distance band. For example, a residential unit is one receptor. For receptors which are not dwellings, professional judgement should be used to determine the number of human receptors. For example a school or hospital is likely to be within the >100 receptor category.

Table A-4 Sensitivity of the area to human health impacts [a] [b] [c]

Receptor sensitivity	Annual Mean PM_{10} Concentrations	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

a. Estimate the total within the stated distance (e.g. the total within 350 metres and not the number between 200 and 350 m), noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20 metres of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 metres is 102. If the annual mean PM_{10} concentration is 29 µg/m^3, the sensitivity of the area would be high.

b. Annual mean PM_{10} concentrations are most straightforwardly taken from the national background maps but should also take account of local sources. The values are based on 32 µg/m^3 being the annual mean concentration at which an exceedance of the 24-hour objective is likely in England, Wales and Northern Ireland.

c. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, simply include the number of properties.

Table A-5 Sensitivity of the area to ecological impacts

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

a. Only the highest level of area sensitivity from the table needs to be considered.

Step 2C Define the risk of impacts

The dust emission magnitude is then combined with the sensitivity of the area to determine the overall risk of impacts with no mitigation measures applied. The matrices in Table A-6 provide a method of assigning the level of risk for each activity. These can then be used to determine the level of mitigation that is required.

Table A-6 Risks of dust impacts

Receptor Sensitivity	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

Step 3 Site-specific mitigation

Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low-, medium- or high-risk site. The highest risk category of a site (of all activities being undertaken) is recommended when considering appropriate mitigation measures for the site. Where risk is

assigned as 'negligible', no mitigation measures beyond those required by legislation are required. However, additional mitigation measures may be applied as good practice.

A selection of these measures is specified as suitable to mitigate dust emissions from activities, based on professional judgement.

Step 4 Determine significant effects

Following Step 2 (definition of the proposed scheme and the surroundings and identification of the risk of dust effects occurring for each activity), and Step 3 (identification of appropriate site-specific mitigation), the significance of the potential dust effects can be determined. The recommended mitigation measures should normally be sufficient to reduce construction dust impacts to a not significant effect.

The approach in Step 4 of the IAQM dust assessment guidance has been adopted to determine the significance of effects with regard to dust emissions. The guidance states the following:

'*For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.*'

IAQM guidance also states that:

'*Even with a rigorous DMP* [Dust Management Plan] *in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects will be 'not significant'.*'

Step 4 of IAQM guidance recognises that the key to the above approach is that it assumes that the regulators ensure that the proposed mitigation measures are implemented. The management plan would include the necessary systems and procedures to facilitate on-going checking by the regulators to ensure that mitigation is being delivered, and that it is effective in reducing any residual effect to 'not significant' in line with the guidance.

Construction Phase Assessment

Step 1: Identify the need for detailed assessment

As there are human receptors within 350 m of the site boundary of the Proposed Development, a dust risk assessment was undertaken.

Based on a review of the MAGIC Maps website, there were no sites designated for ecological protection (such as SSSIs, Ramsar sites, SACs, SPAs, Ancient Woodlands, or National or Local Nature Reserves) within 50m of the site boundary or routes along which trackout may arise. Therefore, ecologically sensitive sites were screened from further assessment.

Step 2A: Define potential dust emission magnitude

Potential dust emission magnitudes from construction activities associated with the Proposed Development were determined in accordance with IAQM 2014 guidance and are detailed in Table A-7 below.

The cumulative impacts of construction dust associated with works at the Proposed Development site and adjacent HS2 construction site have not been assessed. This is because it is assumed both sites would implement measures to mitigate emissions generated, preventing controllable cumulative effects.

Table A-7 Assessed dust emissions magnitude for the Proposed Development site

Type of work	Description of site characteristics with reference to IAQM 2014 guidance/ Dust and Emissions SPG criteria	Dust emissions magnitude
Demolition	Demolition work will take place before the work is consented	None
Earthworks	• <20,000 tonnes material to be excavated • Site area where earthworks will take place <2,500m^2 • Anticipated <5 heavy earth moving vehicles will be active at any one time • Stockpiles would be collected quickly from site • Earthworks are anticipated in October to December	Small
Construction	It is understood that the building is prefabricated (other than the ground floor, which will have a steel frame and block work structure) and will be crane-lifted into position. The construction is therefore expected to have a low potential for dust release.	Small
Trackout	• HGVs will travel over <50m of unpaved ground on site, although the Coburg Street entrance comprises hardstanding • <10 HDV outward movements from site expected on any one day	Small

Step 2B: Define the sensitivity of the area

Table A-8 below summarises the area sensitivity, based on the number of individual receptors around the site, their sensitivity to dust and PM, and their distance from the source of dust (in this instance assumed to be the site boundary for earthworks and construction).

As the dust emissions magnitude for trackout has been assessed as small, the potential for trackout to affect proximal sensitive receptors has been assessed at all receptors within 50m of roads within 50m of the site exit.

According to the client, heavy goods vehicles are expected to enter and leave site from either Euston Road or Hampstead Road through to Cobourg Street via Drummond Street, and Cardington Street site entrance from Hampstead Road. Traffic exiting via Coburg Street is expected to divert along Starcross Street following the existing one-way system. Traffic existing via Cardington Street is also expected to travel northwards through the existing HS2 construction site where Euston Station expansion work is currently taking place. Traffic travelling through the existing HS2 construction site has not been considered further for the assessment of trackout, as it is assumed traffic from this Proposed Development may collect more dust from those site activities and mitigation measures would need to be employed on the adjacent HS2 construction site.

It is understood that the former Maria Fidelis school building to the south of the site has planning consent for use as office and community space. This assessment has taken these proposed land uses into account. No new receptors are expected to be exposed at the consented HS2 construction site to the north of the Proposed Development site while construction work is ongoing, expected to coincide at least with the use of the HS2 office accommodation. A search of the planning portal has indicated that there are no other significant committed and consented developments located within 50m of the Proposed Development site (between 2018 and 2020), such that committed and consented schemes have not been considered further.

Table A-8 Sensitivity of receptors at and around the Proposed Development site

Type of work	Demolition	Earthworks	Construction	Trackout
Dust soiling	**Medium:** >1 medium sensitivity receptor within 20m of development site (offices/ gym at former Maria Fidelis School)	**Medium:** >1 medium sensitivity receptor within 20m of development site (offices/ gym at former Maria Fidelis School)	**Medium:** >1 medium sensitivity receptor within 20m of development site (offices/ gym at former Maria Fidelis School)	**Medium:** 1-10 high sensitivity receptors within 20m of the proposed development site (residential facades) *
Human health**	**Low:** 10-100 medium sensitivity receptors within 20m of building being demolished (Maria Fidelis School)	**Low:** 10-100 medium sensitivity receptors within 20m of site boundary (Maria Fidelis School)	**Low:** 10-100 medium sensitivity receptors within 20m of building being constructed	**Low:** 1-10 high sensitivity receptors within 20m of the proposed development site (residential facades) *

Notes:

* The residential facades on the upper storey have not been assessed as emissions from trackout not expected to influence these receptors.

** The 'area sensitivity' for human health was assessed on the basis of annual mean PM_{10} concentrations being <24µg/m^3, which accords with the 2019 concentrations presented in the UK-AIR background maps for the 1km^2 grid square in which the site is located and modelled pollutant concentrations.

Figure A-1 and Figure A-2 respectively present buffer maps used to determine the distance of receptors from the source of earthworks and construction activities on site (i.e. around the Proposed Development site boundary), and routes along which trackout may occur.

Figure A-1 Buffer maps used to determine the distance of receptors from the source of earthworks and construction activities on site (i.e. around the Proposed Development site boundary)

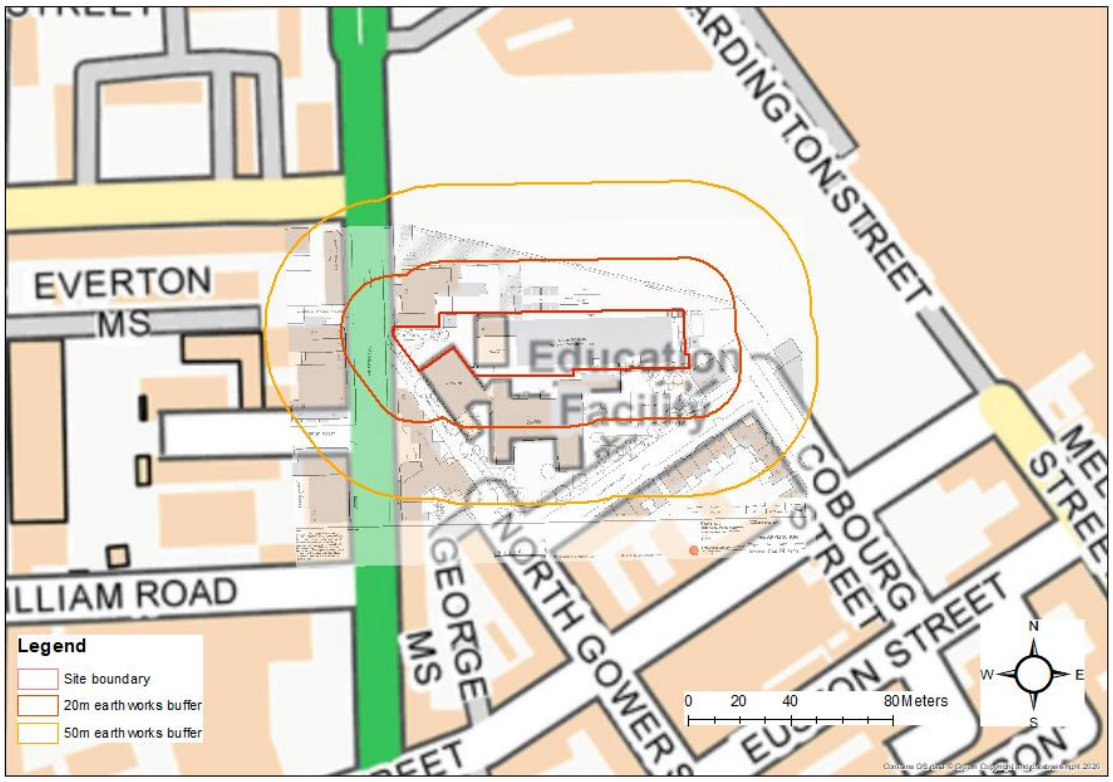
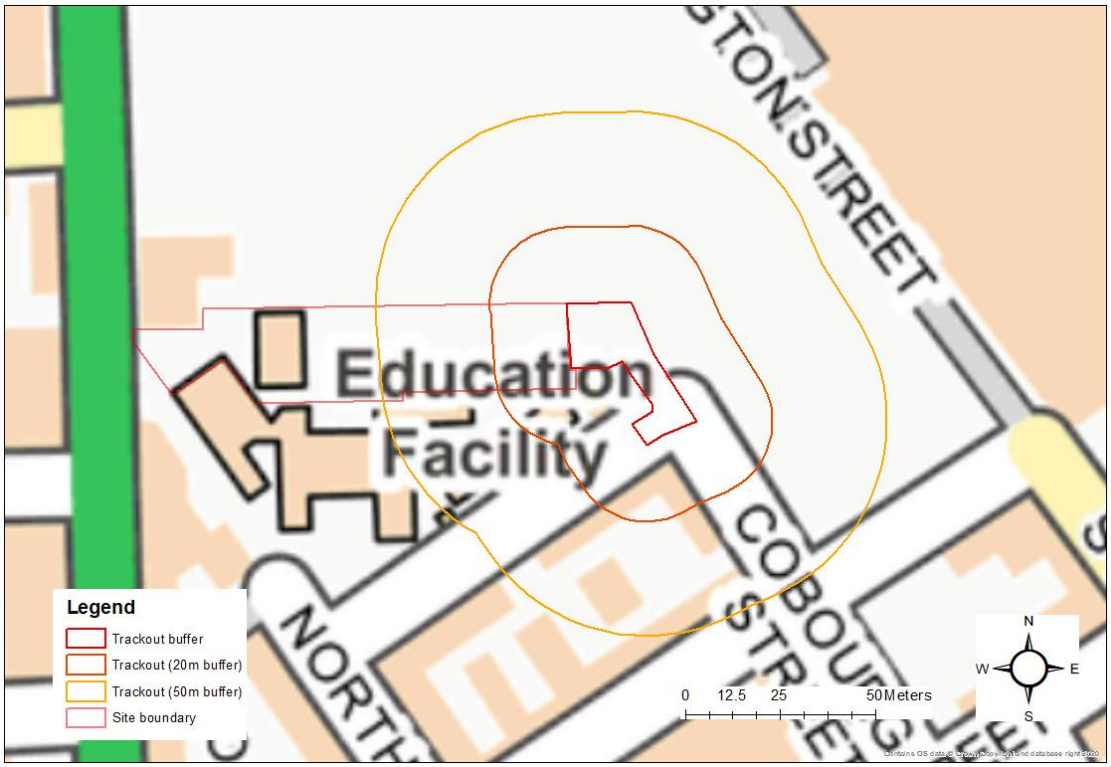


Figure A-2: Distance bands around the assessed route along which trackout could occur



Step 2C: Define the risk of impacts

The construction dust risks were assigned based on the Dust and Emissions SPG and IAQM 2014 guidance assessment process, which assigns risks against the dust emission magnitude (assigned in Step 2a) and the area sensitivity (assigned in Step 2b). The risk of dust impacts derived from the different on-site activities is shown in Table A-9.

Table A-9 Summary of the dust risk from Proposed Development site activities

	Type of Construction Activity			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust Soiling	Low Risk	Low Risk	Low Risk	Negligible Risk
Health Effects	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk
Ecological	Negligible Risk – none expected			

Appendix B: Method for assessing vehicle emissions

Modelling software

The ADMS-Roads detailed dispersion model (version 5) was used to assess direct effects from the additional traffic on local air quality during 2021, the year during which construction related activities will commence, and 2022, the year in which the Proposed Development is expected to be operational.

The ADMS-Roads model considers the key variables that influence pollutant emission and dispersion (meteorology, surface roughness, diurnal traffic flows, predicted future traffic mixes and predicted future engine emission standard mixes). Annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ were predicted at a number of locations in the vicinity of the Proposed Development. The receptors chosen include those that are representative of worst-case exposure locations within the modelled study area.

Assessment scenarios

Predictions of NO_2, PM_{10} and $PM_{2.5}$ were made for the following scenarios:

- **S1:** Baseline 2019: base year;
- **S2:** Without development (2022): future baseline traffic without the Proposed Development in place;
- **S3:** With development (2022): future baseline traffic with the Proposed Development in place;
- **S4:** Base case traffic flows during 2021, modelled to represent the year during which construction works commence (construction related activities will be completed during 2022); and,
- **S5:** Base case traffic flows and flows attributable to construction related traffic during 2021, modelled to represent the year during which construction works commence (construction related activities will be completed during 2022).

Traffic data

The AADT and percentage of heavy-duty vehicles (%HDVs) for the local roads of interest were obtained from the transport team for the Proposed Development. Vehicle speeds were derived from the London Atmospheric Emissions Inventory 2016 traffic model, but sometimes adjusted with reference to speed limits, the advice on modelling junctions and congestion provided within TG16, and professional judgement. Table B-1 and Table B-2 summarise the information used within the assessment. The roads included in the dispersion modelling assessment are also presented in Figure B-1, Figure B-2 and Figure B-3 below.

To estimate 2019 (S1) flows, data were originally derived from the Department for Transport website, in the absence of modelled or surveyed traffic counts. The

substantial difference in traffic flows between 2018 (estimated) and 2019 (surveyed) for the traffic count along Hampstead Road was noted, with the transport team advising the use of 2019 data to estimate future baseline flows. 2019 flows were also applied during the base year for consistency.

At the time of writing, data regarding the number of trips generated as a result of committed or consented developments within 100m of the Proposed Development site were not available, and the LBC air quality specialist was unable to provide feedback on our request for consultation. Base case traffic flows have therefore been factored up using a Tempro growth factor to obtain the S2 and S4 traffic flows. Some changes in traffic flows may be expected as a result of the HS2 construction site adjacent, but the extent of these changes is unknown and has not been considered explicitly within the assessment.

To estimate vehicle flows for S3, the transport team distributed vehicle movements attributable to the CSC and HS2 accommodation and added these to the S2 flows. The additional vehicle movements applied to each road link are approximate, though are expected to be minimal regardless of distribution.

At the time of preparing the assessment, it is understood that the maximum number of daily vehicle movements introduced whilst the Proposed Development undergoes construction is 12, of which up to eight could be heavy goods vehicles. To assess the impacts of the Proposed Development in S5, an additional 12 vehicle movements to each of the modelled roads assessed in S4.

Due to the minimal number of additional vehicles introduced, it was not considered necessary to model the effects of construction traffic attributable to the Proposed Development during 2022, having been assessed instead using 2021 future baseline traffic.

Table B-1 Traffic data for S1, S2 and S3

Link ID	Road name	S1 2019 base year		S2 (Without Development) 2022		S3 (With Development) 2022	
		AADT	%HDV	AADT	%HDV	AADT	%HDV
A	A400 Hampstead Road	19390	9.65	20154	9.65	20164	9.67
B	Euston Road (A4201 Albany Street - A400 Hampstead Road)	76130	4.59	79130	4.59	79138	4.60
C	Euston Road (A400 Hampstead Road - Gower Street)	55597	4.48	57788	4.47	57796	4.48
D	Euston Road (Melton Street - A4200 Upper Woburn Place)	63599	5.70	66105	5.70	66113	5.70

Link ID	Road name	S1 2019 base year		S2 (Without Development) 2022		S3 (With Development) 2022	
		AADT	%HDV	AADT	%HDV	AADT	%HDV
E	A400 Tottenham Court Road (A5204 - A501 Euston Road)	12305	12.86	12790	12.86	12798	12.88
F	A501 Euston Road (east of A420 Eversholt Street)	51573	8.50	53605	8.50	53613	8.51
G	A4200 Eversholt Street (north of Euston Road)	10874	8.15	11302	8.15	11302	8.15
H	A4200 Eversholt Street (south of Euston Road)	14516	16.76	15088	16.76	15088	16.76
I	A400 Gower Street (A501 - New Oxford Street)	14259	10.48	14821	10.47	14821	10.47

Table B-2 Traffic Data for S4 and S5

Link ID	Road name	S4 (Without Development) 2021		S5 (With Development) 2021	
		AADT	%HDV	AADT	%HDV
A	A400 Hampstead Road	19906	9.65	19918	9.68
B	Euston Road (A4201 Albany Street - A400 Hampstead Road)	78155	4.59	78167	4.60
C	Euston Road (A400 Hampstead Road - Gower Street)	57076	4.47	57088	4.49
D	Euston Road (Melton Street - A4200 Upper Woburn Place)	65291	5.70	65303	5.71
E	A400 Tottenham Court Road (A5204 - A501 Euston Road)	12632	12.86	12644	12.91
F	A501 Euston Road (east of A420 Eversholt Street)	52945	8.50	52957	8.51
G	A4200 Eversholt Street (north of Euston Road)	11163	8.15	11175	8.21
H	A4200 Eversholt Street (south of Euston Road)	14902	16.76	14914	16.80
I	A400 Gower Street (A501 - New Oxford Street)	14638	10.48	14650	10.53

Figure B-1 Roads and receptors included in the air dispersion modelling assessment (wide view)

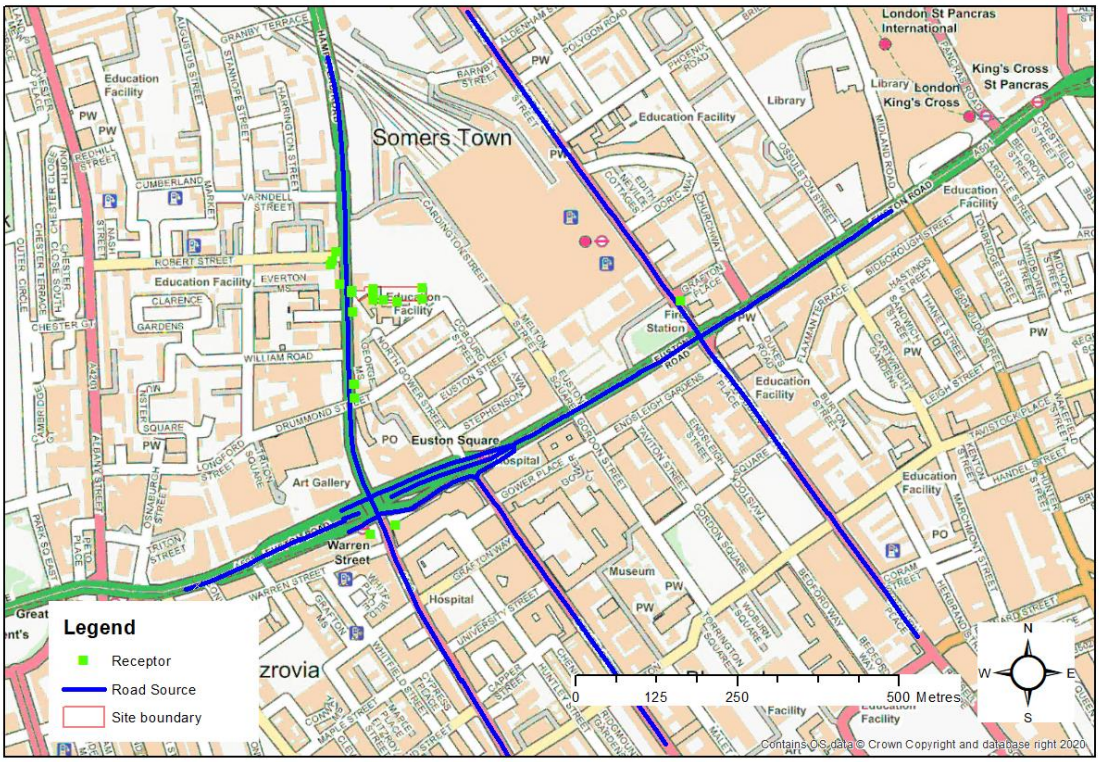


Figure B-2 Roads and receptors included in the air dispersion modelling assessment (centred on Proposed Development site and Hampstead Road)

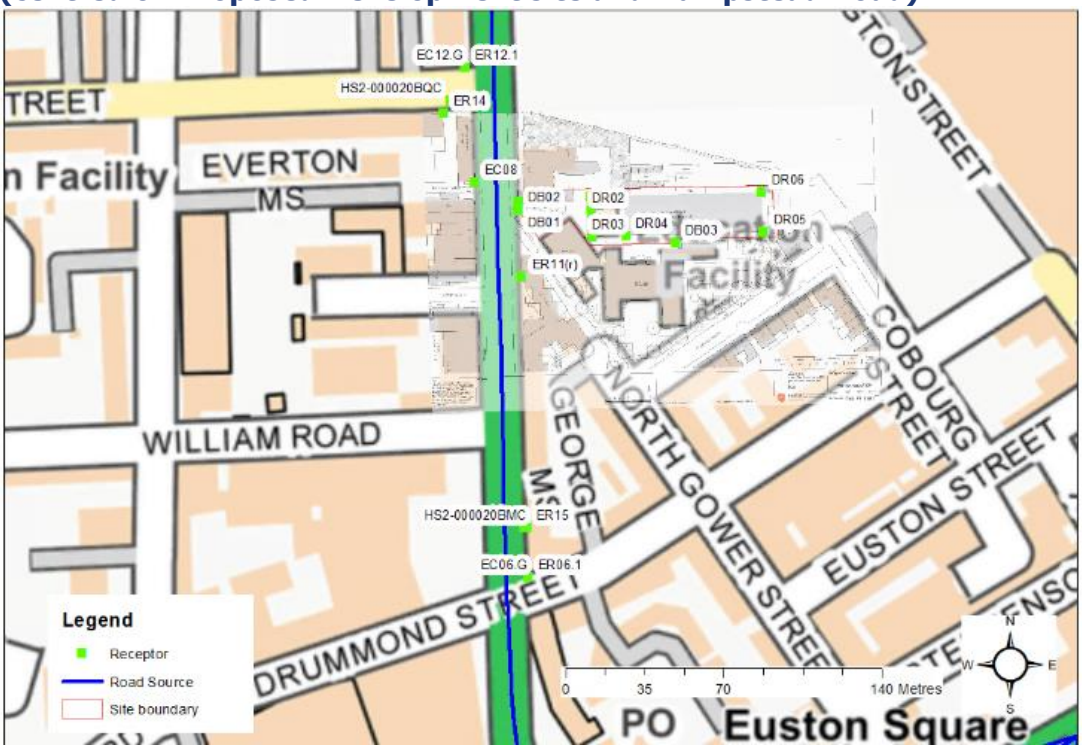
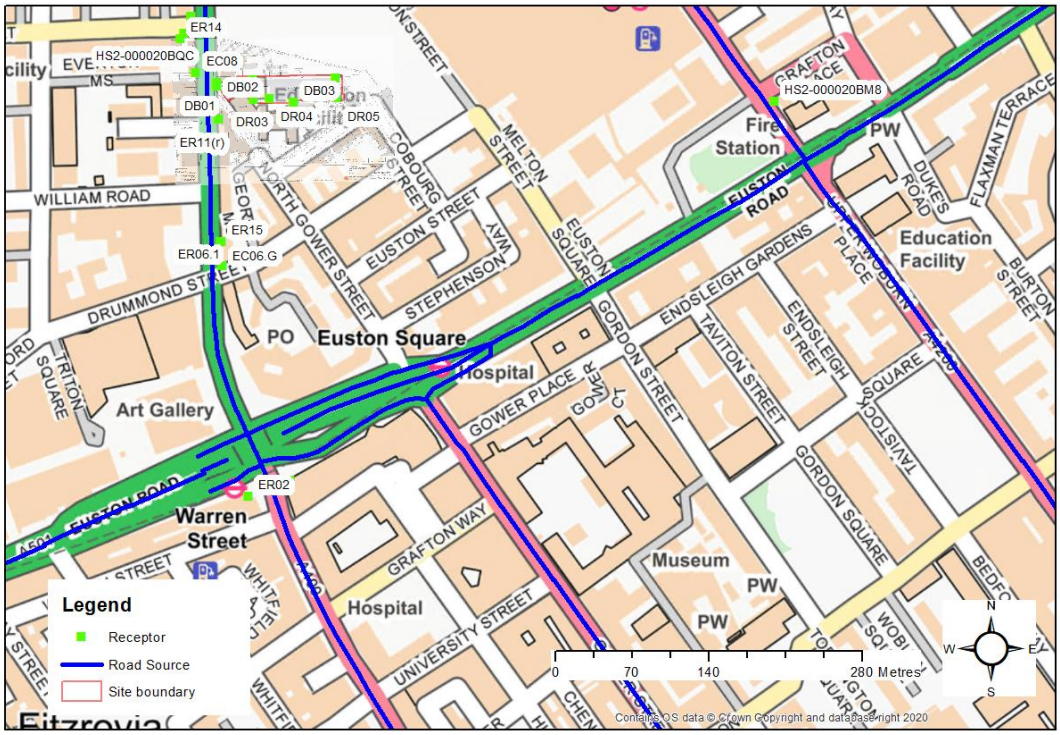


Figure B-3 Roads and receptors included in the air dispersion modelling assessment (centred on Euston Road)



Vehicle emissions factors

The ADMS Roads model assesses the volume of pollutants generated along each stretch of modelled road based on inputted 'emissions factors' (g/km/s).

Defra's emissions factors toolkit was used to determine the emissions of NO_x, PM_{10} and $PM_{2.5}$ from construction and/ or operational traffic along the affected links. London (Inner) or London (Central) settings were selected, depending on the road link modelled and with reference to the *Emissions Factors Toolkit v10.1 User Guide*[27].

In accordance with the Camden Air Quality Planning Guidance, base case (2019) emissions factors have been used. The year 2019 (as opposed to 2020) was selected as it represents the latest year for which a full calendar year of monitoring data (for model verification and adjustment purposes) and Department for Transport traffic data are available.

Using 2019 data also avoids the use of any monitoring data collected during 2020, where ambient air quality will have been affected by the impacts of the Coronavirus pandemic on local and regional road traffic volumes and activity at workplaces including construction sites.

[27] Defra, 2020. Emissions Factors Toolkit v10.1: User Guide: August 2020.

The use of base case emissions factors is considered pessimistic, as it is anticipated that background concentrations will decrease in future years as cleaner vehicles occupy a larger portion of the vehicle fleet. The ULEZ is also due to expand to include the Proposed Development site after October 2021. The ULEZ will apply a charge to any vehicles entering and leaving the zone where they do not meet specific 'Euro' standards representing their emissions (g/km) and is expected to reduce emissions from vehicles using the road network. Consequently, vehicle 'emissions factors' are also expected to decrease further over time and the predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ are likely to be pessimistic.

Diurnal profiles can be applied to factor the emissions factors during each hour of a week, and during each month of the year, up or down in accordance with observed variations in traffic volumes. In the absence of traffic data to enable for a local diurnal profile to be used, a diurnal profile using data obtained from nationally observed variations in traffic flows based on 2019 weekly variations and monthly observations observed between 2015-2019, downloaded from the Department for Transport website, has been applied.

Modelled receptors

Sensitive existing receptors, such as residential properties and the University College Hospital, were selected as locations where members of the public are expected to be regularly present and potentially regularly exposed to air pollutants. To estimate pollutant concentrations at locations where future baseline concentrations may be expected to be highest, receptors were typically positioned in proximity to junctions or in locations where building configuration would inhibit the dispersion of pollutants generated by road traffic.

In some instances, residential receptors at these 'worst case' locations were elevated to first floor level, above shops or other locations where members of the public may be exposed for one hour. At these locations, receptors have been located at ground floor level for comparison to the hourly mean NO_2 AQO, and at first floor level, to represent pollutant concentrations at the residential façade.

In addition, receptors were selected within the Proposed Development Site to assess whether future users may be exposed to poor ambient air quality when the Proposed Development is operational. Receptors were located at all floor levels.

The assessment has assumed that all receptors at ground floor level are elevated to 1.5m above ground level, to represent the average breathing height for a human. The Proposed Development elevation plans were used to elevate receptors at higher storeys to 1.5m above the height of each finished storey. It is assumed that the height of each existing building modelled is three metres, in the absence of development plans.

Existing and future (new) sensitive receptors modelled are shown in Table B-3, Figure B-2 and Figure B-3.

Table B-3: Receptors included in construction traffic air pollutant dispersion modelling

Receptor number	Receptor description	Coordinates		Height (m)	Storey	AQO applied
		x (m)	y (m)			
Receptors at the Proposed Development site						
DB01	Boundary of Proposed Development site	529227	182662	1.5	Ground	Hourly
DB02		529227	182658	1.5	Ground	Hourly
DB03		529297	182643	1.5	Ground	Hourly
DR01	Façade of Proposed Development site (CSC)	529259	182664	1.5	Ground	Annual, daily and hourly
DR02		529259	182658	1.5	Ground	Annual, daily and hourly
DR03		529260	182646	1.5	Ground	Annual, daily and hourly
DR04		529275	182647	1.5	Ground	Annual, daily and hourly
DR05		529336	182648	1.5	Ground	Annual, daily and hourly
DR06		529335	182666	1.5	Ground	Annual, daily and hourly
DR07		529317	182648	1.5	Ground	Annual, daily and hourly
DR08		529304	182647	1.5	Ground	Annual, daily and hourly
DR09		529289	182647	1.5	Ground	Annual, daily and hourly
DR09a		529317	182666	1.5	Ground	Annual, daily and hourly
DR09b		529304	182665	1.5	Ground	Annual, daily and hourly
DR09c		529288	182665	1.5	Ground	Annual, daily and hourly

Receptor number	Receptor description	Coordinates		Height (m)	Storey	AQO applied
		x (m)	y (m)			
DR11	Façade of Proposed Development site (HS2)	529259	182664	5.475	First	None*
DR12		529259	182658	5.475	First	None*
DR13		529260	182646	5.475	First	None*
DR14		529275	182647	5.475	First	None*
DR15	Façade of Proposed Development site (CSC)	529336	182648	5.475	First	Annual, daily and hourly
DR16		529335	182666	5.475	First	Annual, daily and hourly
DR17		529317	182648	5.475	First	Annual, daily and hourly
DR18	Façade of Proposed Development site (HS2)	529304	182647	5.475	First	None*
DR19		529289	182647	5.475	First	None*
DR19a	Façade of Proposed Development site (CSC)	529317	182666	5.475	First	Annual, daily and hourly
DR19b	Façade of Proposed Development site (HS2)	529304	182665	5.475	First	None*
DR19c		529288	182665	5.475	First	None*
DR21		529259	182664	8.47	Second	None*
DR22		529259	182658	8.47	Second	None*
DR23		529260	182646	8.47	Second	None*
DR24		529275	182647	8.47	Second	None*
DR25		529336	182648	8.47	Second	None*
DR26		529335	182666	8.47	Second	None*
DR27		529317	182648	8.47	Second	None*
DR28		529304	182647	8.47	Second	None*
DR29		529289	182647	8.47	Second	None*

Receptor number	Receptor description	Coordinates x (m)	Coordinates y (m)	Height (m)	Storey	AQO applied
DR29a		529317	182666	8.47	Second	None*
DR29b		529304	182665	8.47	Second	None*
DR29c		529288	182665	8.47	Second	None*
DR31		529259	182664	12.405	Third	None*
DR32		529259	182658	12.405	Third	None*
DR33		529260	182646	12.405	Third	None*
DR34		529275	182647	12.405	Third	None*
DR35		529336	182648	12.405	Third	None*
DR36		529335	182666	12.405	Third	None*
DR37		529317	182648	12.405	Third	None*
DR38		529304	182647	12.405	Third	None*
DR39		529289	182647	12.405	Third	None*
DR39a		529317	182666	12.405	Third	None*
DR39b		529304	182665	12.405	Third	None*
DR39c		529288	182665	12.405	Third	None*
DR41		529259	182664	15.87	Fourth	None*
DR42		529259	182658	15.87	Fourth	None*
DR43		529260	182646	15.87	Fourth	None*
DR44		529275	182647	15.87	Fourth	None*
DR45		529336	182648	15.87	Fourth	None*
DR46		529335	182666	15.87	Fourth	None*
DR47		529317	182648	15.87	Fourth	None*
DR48		529304	182647	15.87	Fourth	None*

Receptor number	Receptor description	Coordinates x (m)	Coordinates y (m)	Height (m)	Storey	AQO applied
DR49		529289	182647	15.87	Fourth	None*
DR49a		529317	182666	15.87	Fourth	None*
DR49b		529304	182665	15.87	Fourth	None*
DR49c		529288	182665	15.87	Fourth	None*
DR51		529259	182664	19.335	Fifth	None*
DR52		529259	182658	19.335	Fifth	None*
DR53		529260	182646	19.335	Fifth	None*
DR54		529275	182647	19.335	Fifth	None*
DR55		529336	182648	19.335	Fifth	None*
DR56		529335	182666	19.335	Fifth	None*
DR57		529317	182648	19.335	Fifth	None*
DR58		529304	182647	19.335	Fifth	None*
DR59		529289	182647	19.335	Fifth	None*
DR59a		529317	182666	19.335	Fifth	None*
DR59b		529304	182665	19.335	Fifth	None*
DR59c		529288	182665	19.335	Fifth	None*
Facades of existing receptors						
EC06.G	Pharmacy at Hampstead Road/ Drummond Street junction	529231	182495	1.5	Ground	Hourly
EC08	Façade of Surma Community Centre	529207	182671	1.5	Ground	Hourly
EC12.G	Façade of sandwich shop, Hampstead Road	529203	182722	1.5		
ER01	North-western ground floor façade of University College Hospital	529294	182300	1.5	Ground	Annual, daily and hourly
ER02	Façade of Warren Street tube station	529255	182285	1.5	Ground	Hourly

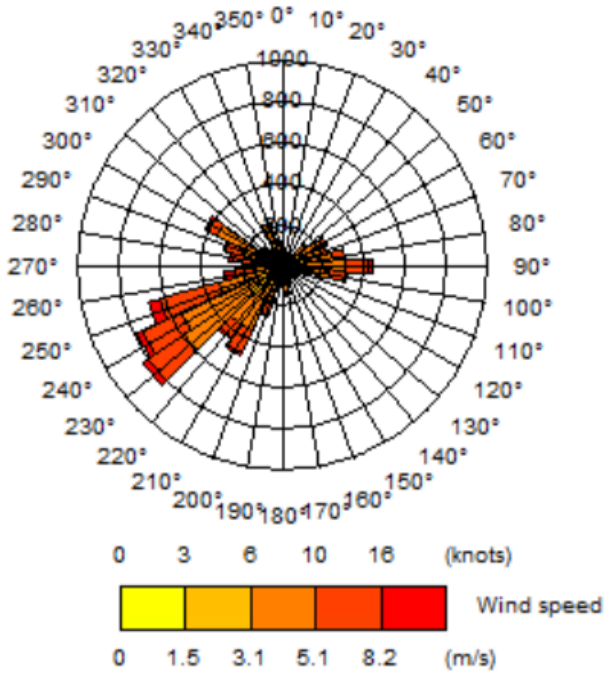
Receptor number	Receptor description	Coordinates x (m)	Coordinates y (m)	Height (m)	Storey	AQO applied
ER06.1	Residential façade, Hampstead Road	529231	182495	4.5	Ground	Annual, daily and hourly
ER11(r)	Façade of existing residence along Hampstead Road	529228	182628	1.5	Ground	Annual, daily and hourly
ER12.1	Residential façade, Hampstead Road	529203	182722	4.5	First	Annual, daily and hourly
ER14	Façade of existing residence along Robert Street (near Hampstead Road)	529193	182701	1.5	Ground	Annual, daily and hourly
ER15	Façade of existing residence along Hampstead Road	529230	182517	1.5	Ground	Annual, daily and hourly
Facades of diffusion tubes (included for model verification and adjustment purposes)						
HS2-000020BM8	Diffusion tube used for model verification and adjustment	529735	182645	2.3		N/A

Note: * Receptors are commercial (HS2 office accommodation) and therefore future users of the Proposed Development site would not be exposed to poor ambient air quality at these receptor locations.

Meteorological data

This study used 2019 meteorological data from London City Airport, which is considered a suitable, representative site. The wind rose (showing the wind direction and speed) for each year of meteorological data used are set out in Figure B-4.

Figure B-4: Wind rose from the London City Airport meteorological station during 2019



9.2 Summary of additional model inputs

A summary of the additional parameters considered in the dispersion modelling study are outlined in Table B-4 below.

Table B-4 Summary of additional model input parameters

Parameter	Description	Response
Road elevation	Elevation of road above ground level	No terrain file used.
Road width	Width of road (m)	Road widths determined based on approximate measurement of roads using online measurement tools.
Canyon heights	Height of canyons effects turbulent flow patterns; these are greater with larger canyon heights.	Receptor ER15 modelled within a street canyon (in S2 – S5).
Surface roughness	This defines the surface roughness of the model area.	A value of 1.5 at the dispersion site and 0.5 at the meteorological site.
Monin-Obukhov length	A boundary layer parameter required to precisely describe the atmospheric stability conditions and to predict dispersion of pollutants released	Assumed to be 100m at the site (representative of large conurbations). Was set to 30m at meteorological data site.

Model verification

Model verification refers to checks that are carried out on model performance in relation to roads modelling at a local level. Modelled concentrations are compared with the results of local monitoring and, where there is a disparity between modelled and monitored concentrations, an adjustment may be applied to the final model output.

Model verification for NO_2 was undertaken for this assessment using 2019 data monitored at diffusion tube HS2-000020BM8. This monitoring location was selected as they are the nearest 'roadside' monitoring sites to the Proposed Development site which are not unduly influenced by buildings forming street canyons. Tubes HS2-000020BM8 and HS2-000020BQC were also initially included for model verification, although were discarded; respectively due to the potential influence of building configuration on the street canyon layout during 2019 near HS2-000020BMC, and as the roadside concentration and background concentration at HS2-000020BQC were unexpectedly similar and would have unduly skewed the factor.

Model verification for PM_{10} and $PM_{2.5}$ was undertaken using the NOx verification factor. This approach is recommended in TG16 where there are no suitable 'roadside' verification sites within the vicinity of the Proposed Development site. LBC's Euston Road automatic monitor was located less than 1m from the kerb during 2019, which was prior to the cycle lane being constructed.

Table B-5 below summarises the comparison of monitored versus modelled NOx concentrations at the diffusion tube used for model verification and assessment. The monitored road NOx was calculated by converting roadside NO_2 (i.e. monitored NO_2 – background NO_2) to NOx using the latest version of the NOx to NO_2 calculator. The model was identified as underpredicting modelled pollutant concentrations by a factor of 2.9904. This adjustment factor was applied to all modelled road concentrations before being combined with background concentrations.

Table B-5: Verification table for NO_x

Site number	HS2-000020BM8
Monitored total NO_2 (µg/m^3)	56.3
Background NO_2 (µg/m^3)	35.41
Modelled road contribution NO_X (µg/m^3)	17.08
Monitored road contribution NO_x (µg/m^3)	51.08
Monitored NO_X / modelled NO_X (correction factor)	**2.99**

Background concentrations

The total concentration of a pollutant comprises those from the modelled local emission sources and background pollutant concentrations, which are transported into an area by the wind from further away.

The Camden Air Quality Planning Guidance states that background pollutant concentrations should be derived from *'the closest Automated Monitoring Station or the data for the location from the background mapping published by Defra, whichever is the more pessimistic.'* As shown in Section 4, the Defra estimated background concentration is larger than the annual mean NO_2 concentration monitored at the London Bloomsbury automatic monitoring station for 2019. Consequently, the annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations from 2019 Defra background mapped concentration (2018 base year) has been applied at each of the modelled receptor locations. As stated above, vehicle emissions are projected to reduce with time and local monitoring data show current background concentrations near site to be lower than those estimated in the $1km^2$ background map where the site is located.

Therefore, the use of base case background maps in the future is likely to be pessimistic and total annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations will be overestimated in S2 to S5.

As all Primary A roads were modelled within the 529500, 182500 grid square containing all modelled receptors, the 'primary A roads in' contribution was removed from all modelled receptors. In the case of NO_2, this was done using the 'NO_2 adjustment for NOx sector removal tool'.[28]

The 2019 annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations applied (following adjustment) at each of the receptor locations is shown in Table B-6.

Table B-6: Background annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations applied at each of the modelled receptor locations

Pollutant	Background applied (µg/m³)	Objective
NO_2	35.4	40
PM_{10}	20.1	40
$PM_{2.5}$	12.8	25

Post-processing of results

At each receptor, the following method was used to estimate total annual mean pollutant concentrations:

[28] NO_2 Adjustment for NOx Sector Removal Tool (version 8.0). Department for Environment, Food and Rural Affairs, 2020.

- Modelled road NOx, PM_{10} and $PM_{2.5}$ concentrations were adjusted (as part of model verification) using the method set out above and as per TG16;
- The road source NO_2 at each receptor was estimated from the modelled NOx concentration using version 8.1 of the NOx to NO_2 calculator[29]; and,
- Adjusted annual mean road NO_2, PM_{10} and $PM_{2.5}$ concentrations were added to the applicable background concentration, shown in Table B-6.

The number of days per annum where the 24-hour mean PM_{10} AQO may exceed 50µg/m^3 (and therefore would breach the AQO) was estimated using the following formula, derived from TG16: -18.5+0.00145*([N] ^3)+(206/[N]), where [N] is the predicted annual mean concentration at each receptor location.

TG16 indicates that breaches of the hourly mean NO_2 AQO should not be excepted if annual mean NO_2 concentrations are below 60µg/m^3. This criterion has been used to determine whether the Proposed Development is likely to expose receptors into an area where the hourly mean may be breached.

[29] Defra NO_x to NO_2 Calculator (v8.1) https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

Appendix C: LB Camden air quality proforma and air quality planning checklist

Figure C-1 Screenshot from 'Summary' tab (part 1) of Camden Air Quality Proforma v1

Introduction: **This Proforma is intended to help you understand the air quality considerations we will take into account when considering an application in Camden, as well as helping us to consider the application. This does not replace the requirement to provide an Air Quality Assessment or the detailed guidance in the Camden Planning Guidance (CPG) on Air Quality. Any information provided should be referenced to the relevant section of submitted supporting documents. This summary page will help provide key details on the application.**

Application details:								**Guidelines / notes**
Application number (when known)	Not known							
Scheme name	Maria Fidelis Construction Skills Centre and Site Accommodation							*Any known intended name for the development*
Scheme address	North Gower Street, Euston Road, London							
Postcode	NW1 2LY							
Type of development (choose drop down options)	Non-residential							
No. of residential units								*10+ residential units is a Major development even if less than 1000 sq.m. If over 75 new residences then an AQ*
	Existing	Proposed						*This should include all floor area which is part of the application including change of use and refurbishment. Ove*
Scale of development details (m^2)	TOTAL pre-development	For demolition	New-build incl. infills, re-build, extensions	Retained (refurbished or Change of Use)	TOTAL post-development	Net UPLIFT post-development		*New total floor area minus floor area of any existing buildings*
Total floor area of development (GIA)			7125	0	7125	7125		
of which residential					0	0		
of which non- residential			7125		7125	7125		*If a commercial development with floorspace over 2,500sqm then an AQA is required.*
Air Quality Assessment document details	Maria Fidelis Site Accommodation and Construction Skills Centre Air Quality Report, Mace Dragados Joint Venture, 2021							*Full title, author, date and version*
Baseline scenario year used (projections not accepte	2019							
Development year used for scenarios	2021 (construction phase), 2022 (operational phase). All use 2019 emissions factors.							*Note this should not be in the future as future background concentrations are not accepted.*

	1. Air Quality Assessment (AQA) requirement				**Location of justification /**	
Approve/Condition/Refuse	Air Quality in development area (to determine assessment requirement)	Response		Document	Page/ section reference	
	a. NO_2 at development site	48.22	$\mu g/m^3$ per annum	Air quality assessment	4.5	*Refer to LAEI 2016 maps (or more recent version if available), local monitoring data or site specific monitoring.*
	b. PM_{10} at development site	25.13	$\mu g/m^3$ per annum	Air quality assessment	4.5	*Refer to LAEI 2016 maps (or more recent version if available), local monitoring data or site specific monitoring.*
	c. $PM_{2.5}$ at development site	15.05	$\mu g/m^3$ per annum	Air quality assessment	4.5	*Refer to LAEI 2016 maps (or more recent version if available), local monitoring data or site specific monitoring.*
	d. Does the proposal introduce new receptors?	YES		Air quality assessment	6.2	*Sensitive uses include residential use in areas exceeding the long term objective. Therefore any net increase in*
	e. Will the proposals include sensitive receptors?	YES		Air quality assessment	6.2	*Nurseries, schools, care homes, hospitals*
	f. Is there a likely increase in traffic levels from existing base?	YES		Air quality assessment	Table B-2	*Expected increase in Annual Average Daily Traffic*
	g. Includes biomass boilers or CHP (combined heat and power)	NO		Air quality assessment	3.1.3	
	h. Includes connections to existing decentralised energy networks	NO		Air quality assessment	3.1.3	
	i. Involves substantial earthworks or demolition?	YES		Air quality assessment	5.1	*Should include all works classified as medium or large for STEP2A of the Guidance on the Assessment of dust*
			Response			
	j. Given responses above (using flow chart below) what minimum level of AQA is required?		Detailed	**Go to relevant AQA tab (if required)**		*Note if a basic (screening) AQA then identifies the need for a detailed assessment then this should be complete*

Figure C-2 Screenshot from 'Summary' tab (part 2) of Camden Air Quality Proforma v1

Criteria met				Assessments Required		
Scale	**Area of Poor Air Quality**	**Scheme brings sensitive receptors**	**Scheme brings air quality impacts**	**Air Quality Assessment type**	**Air Quality Neutral**	**Construction and Demolition Impacts**
Major	YES	YES	YES	**Detailed**	Required	Required
			NO			
		NO	YES	**Detailed**		
			NO	Basic		
	NO	YES	YES	**Detailed**		
			NO	Basic		
		NO	YES	**Detailed**		
			NO	Basic		
Minor	YES	YES	YES	**Detailed**	Not required	May be required
			NO	Basic		
		NO	YES	Basic		
			NO	*Not required*		
	NO	YES	YES	**Detailed**		
			NO	*Not required*		
		NO	YES	Basic		
			NO	*Not required*		

As set out in CPG Air Quality

Area of poor air quality - an area with NO_2 within 5% below the air quality objective, 38µg/m^3 (micrograms per
Sensitive uses include nurseries, schools, care homes, hospitals and residential use in areas exceeding the lon
Air quality impacts - proposals produces changes in emissions from building sources, small industrial processe

Working in partnership

Figure C-3 Screenshot from 'Detailed AQA' tab (part 1) of Camden Air Quality Proforma v1

Recommendation (Council to complete)	2. Background AQ					
	Background concentrations used for modelling	Response		Document	Page/ section reference	
Approve/Condition/Refuse	a. Background annual NO_2 in vicinity of development	35.4	$\mu g/m^3$	Air quality assessment	Appendix B - Background concentrations (see also notes below)	*Current year only. Future projections are not accepted.*
Approve/Condition/Refuse	b. Background annual PM_{10} in vicinity of development	20.1	$\mu g/m^3$	Air quality assessment	Appendix B - Background concentrations (see also notes below)	*Current year only. Future projections are not accepted.*
Approve/Condition/Refuse	c. Background annual $PM_{2.5}$ in vicinity of development	12.8	$\mu g/m^3$	Air quality assessment	Appendix B - Background concentrations (see also notes below)	*Current year only. Future projections are not accepted.*
	d. Background data source	DEFRA background maps		Air quality assessment	Appendix B - Background concentrations (see also notes below)	*DEFRA background maps for relevant grid square, nearest background Automatic Monitoring Station, or site specific monitoring whichever is the highest.*
	3. Operational impact of development on local area					
Approve/Condition/Refuse		Response		Document	Page/ section reference	*See CPG Air Quality Chapter 4*
	a. If gas boilers are proposed what is the NO_x rating?	N/A	$\mu g/m^3$	N/A	N/A	*Local Plan section 8.85 requires all new boilers to be Ultra Low Nitrogen Oxide (NOx) (<40 mg/kWh).*
	b. Is the development "zero on-site emission" (energy sources)	YES		Air quality assessment	3.1.1	*Zero building emissions associated with heat and power supply / generation*
	c. Is the development "zero on-site emission" (non-energy sources)	YES		Air quality assessment	3.1.1	*Zero building emissions associated with other sources e.g. process heat / industrial processes/commercial activities/waste combustion*
	d. Is the development car free?	YES		Air quality assessment	8.2 (see note 1 below)	*Local Plan policy T2 requires all new developments in the borough to be car free*
	e. Is CHP proposed?	NO		Air quality assessment	3.1.1	
	f. Is a biomass boiler proposed?	NO		Air quality assessment	3.1.1	
	g. Is any stack at least 1m above the highest part of the development?	N/A		N/A	N/A	
	h. What output capacity of emergency or STOR generation is proposed?	N/A	kWe		See note 7 below.	*Total generation capacity of emergency or Short Term Operating Reserve (STOR) generation. If none put "0"*
	i. Emergency or STOR generation fuel source?	No			See note 7 below.	

Figure C-4 Screenshot from 'Detailed AQA' tab (part 2) of Camden Air Quality Proforma v1

3a. Air Quality Neutral Assessment (required for all Major developments)

All Major developments are schemes of 10 or more dwellings or buildings where the floorspace created is 1,000 square metres or more. See CPG Air Quality Chapter 3.

	NO_x kg per annum	PM_{10} kg per annum	Document	Page/ section reference	
					See CPG Air Quality Chapter 3
Building Emissions Benchmark (BEB)	0	0	Air quality assessment	6.3 (see notes below)	*See Appendix 5 of Mayor of London Sustainable Design and Construction Supplementary Planning Guidance April 2014*
Total Building Emissions for development	0	0	Air quality assessment	6.3 (see notes below)	
Difference	0	0			*If greater than 0 then the proposals are not air quality neutral*
Transport Emissions Benchmark (TEB)	9.05	1.57	Air quality assessment	6.3	*See Appendix 5 of Mayor of London Sustainable Design and Construction Supplementary Planning Guidance April 2014*
Total Transport Emissions for development	8.78	1.52	Air quality assessment	6.3	
Difference	-0.27	-0.05			*If greater than 0 then the proposals are not air quality neutral*
Air Quality Neutral	CHECK SITE DETAILS				

4. Operational impact of development on occupants

Model details	Response
a. Emissions factor toolkit version used	EFT v10.1
b. Air quality modelling software used (names and versions)	ADMS Roads v5

E.g. EFT 10.1 Document should detail justification if not using most up to date

If more than one then ensure all details are set out and referenced in the document

Modelled annual expected (worst case) air quality at the development	Response	Document	Page/ section reference	
				Note Modelling should not predict improvements to future years (future vehicle emissions or future background concentrations).
a. Are any expected 'with development' NO_2 levels for the site above 38µg/m^3	YES	Air quality assessment	6.2 (see note 3 below)	*If yes then APEC B applies. Mitigation is expected for new residential uses or other sensitive uses*
b. Are any expected 'with development' NO_2 levels for the site above 42µg/m^3	NO	Air quality assessment	6.2 (see note 3 below)	*If yes then APEC C applies. Refusal on air quality grounds should be anticipated for new residential and sensitive use developments. Worker exposure in non-residential developments should be considered further. Mitigation measures must be presented in the AQA detailing anticipated outcomes of mitigation measures*
c. Are any expected 'with development' NO_2 levels for the site above 60µg/m^3	NO	Air quality assessment	6.2 (see note 3 below)	*Exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m^3 If yes and members of the public are likely to stay for over 1 hour then refusal should be anticipated unless it is designed to mitigate the impact.*
d. Are any expected 'with development' PM_{10} levels for the site above 20µg/m^3	YES	Air quality assessment	6.2 (see note 3 below)	
e. Are any expected 'with development' $PM_{2.5}$ levels for the site above 10µg/m	YES	Air quality assessment	6.2 (see note 3 below)	
f. Has air quality been modelled at all levels and all facades?	YES	Air quality assessment	6.2 (shows results to predicted pollutant concentrations relative to facades modelled). Receptor locations are also	

Figure C-5 Screenshot from 'Detailed AQA' tab (part 3) of Camden Air Quality Proforma v1

Approve/Condition/Refuse	Mitigation proposed to protect internal air quality	Response	Document	Page/ section reference	
	a. Is MVHR proposed?	YES	Air quality assessment	8.2	
	b. Will the MVHR inlet(s) be at roof level and away from busy roads and other emission sources such as extract systems and flues?	YES	Air quality assessment	8.2	
	c. Is NO_x filtration proposed?	NO	Air quality assessment	8.2	
	d. Is particulate filtration proposed?	NO	Air quality assessment	8.2	
	e. Will windows be openable?	No	Air quality assessment	8.2 (see note 4 below)	
	f. Are winter gardens proposed?	N/A	Air quality assessment	N/A	
	g. Other mitigation proposed (provide reference for details)	NO	Air quality assessment	N/A	
	5. Demolition and construction impact				
		Response	Document	Page / section reference	*See CPG Air Quality Chapter 4*
	a. What is the highest demolition/construction dust risk ***before*** mitigation?	low	Air quality assessment	Appendix A	*Control measures appropriate to the highest risk across any phase of development (demolition, earthworks, construction or trackout) should be applied. See SPG 8 The control of dust and emissions during construction and demolition for details.*
Approve/Condition/Refuse	b. Has mitigation been proposed in line with the GLA checklist for risk level in	YES	Air quality assessment	8.1	*Checklist in Appendix 7 of the Mayor of London's SPG 8 The Control of Dust and Emissions During Construction and Demolition July 2014*
	c. Is real time dust monitoring proposed?	NO	Air quality assessment	8.1	
Approve/Condition/Refuse	d. How many real time dust monitors are proposed?	TBC	Air quality assessment	8.1 (See note 6 below)	*If 'Medium' risk then at least 2 and if 'High' risk then at least 4 real time monitors are required. See Chapter 4 of CPG Air Quality.*
	e. Are there any other developments within a 100m radius of the development	YES	Air quality assessment	Appendix A	*Cumulative impacts: Consideration of the potential cumulative impacts on air quality which may arise during the construction or operational phases as a result of emissions arising from other developments within a 100m radius of the development.*
	f. Is the site within 10m of a school or hospital?	NO	Air quality assessment	Appendix A. See note 5 below	*Protective measures?*
	g. Is the site within 500m of a school or hospital?	YES	Air quality assessment	Appendix A. See note 5 below	

Additional comments / notes (please use cover letter or provide references to sections in documents in orange boxes for significant details):

1) Proposed Development will only allow for dignitaries to park on site.
2) Building emissions benchmark not calculated as no non-electric plant proposed.
3) On-site pollutant concentrations referred to above only considered at facade (aside from part c where screening against hourly mean AQO recommended).
4) Within the CSC, windows may have the functionality to allow them to open, but can be kept locked shut and be openable only for maintenance. Requirement to keep windows closed does not apply to office accommodation as not representative of expoure to annual mean NO_2 concentrations (exposure at offices not relevant).
5) University College Hospital and Netley Primary School located within 500m but not affected maximum receptor sensitivity within the dust risk assessment. Adjacent Maria Fidelis school understood to be vacated and change of use application permitted for use as office and community facilities.
7) No generators are proposed as part of the site. An allowance will be made for somewhere to 'plug one in' should it ever be necessary in the future but we will not have in in place as part of the design or supply strategy.

Camden

Air Quality Planning Checklist

This document is to be completed for all developments that are subject to an Air Quality Assessment (AQA).

Travel and Transport

1) If there will be parking in the development, will electric vehicle charging point/s be included?

   Not applicable. No parking to be provided with exception of occasional dignitaries. No electric charging to be included.

   If yes – please state how many, if no, please state why have they not been included.

2) Will secure cycle storage be provided for users of the building?

   Yes. Secure cycle storage is to be provided separately for both the CSC (40) and Site Accommodation (98).

   If yes – please state how many, if no, please state why have they not been included.

Energy

3) If a CHP is to be included, did you ensure that this technology is suitable for the energy requirements of the building? Please see Camden's Boiler Guidance Manual B for more information.

   Not applicable

   If yes, please briefly summarise why CHP was selected for this site.

4) If CHP is to be included, will it adhere to the GLA CHP Emissions Limits outlined in the *GLA's* Sustainable Design and Construction SPG?

   Not applicable

5) Has the impact of the CHP been modelled within the air quality assessment? **Not applicable**

Please note that if CHP modelling was not included due to the fact that the final CHP specification has not been decided, this will need to be clearly stated in the draft AQA, and the potential impact of the CHP will still need to be considered when assessing the exposure of occupants and/or locations of any ventilation inlets, if applicable. If full details of the CHP have not been included at Planning Application stage, Camden will impose a stringent Planning Condition for the CHP, which will include a requirement for modelling of the impact at all sensitive receptors, as well as a requirement that it adheres to the requirements of the GLA's Sustainable Design and Construction SPG.

Exposure

6) If located in an area of poor air quality and/or next to a busy road or diesel railway line, does the AQA include details of the way in which the building has been designed to reduce the exposure of occupants (e.g. through orientation, greening, placement of residential properties, or, only for developments in areas of very poor air quality, mechanical ventilation?)

Y. The Proposed Development is set back some distance from Hampstead Road. Facades are sealed and mechanical ventilation is proposed.

If not, the AQA must be revised to include this information.

Construction Dust

7) Does the project have a Construction Management Plan written in accordance with the recommendations in the Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance, including an assessment of the risk? And, if the risk is Medium or High, a real time monitoring proposal?

Y. Recommendations are in line with SPG. Risk is low. No monitoring required.

If not, this must be provided.

Air Quality Neutral

8) Does the AQA include an assessment against the GLA's Air Quality Neutral Standard?

Y

If not, this must be included, as outlined in the GLA's Sustainable Design and Construction SPG.

Please return this form with your AQA with your Planning Application