Burke Hunter Adams

KOKO, 65 Bayham Place, 1 Bayham Street and the Hope and Anchor Public House, Camden

Air Quality Assessment

Project No. 442569

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RSK

RSK GENERAL NOTES

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Title: KOKO, 65 Bayham Place, 1 Bayham Street and The Hope and Anchor Public House, Camden.

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Signature		Signature	
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Summary

A 'simple' air quality assessment for the proposed development at KOKO, 65 Bayham Place, 1 Bayham Street and The Hope and Anchor Public House, Camden, has been prepared with reference to existing air quality in the area and relevant air quality legislation, policy and guidance.

The proposed development comprises the '*demolition of 65 Bayham Place, 1 Bayham Street (retention of façade) and rebuilding to provide a 32 bedroom boutique hotel with extension to the rear and additional basement; retention and refurbishment of the Hope & Anchor Public House (Use Class A4) to provide restaurant and bar, minor reconfiguration to circulation space within KOKO. Conversion of the flytower for use by the hotel with the retention of the original theatre equipment. Installation of fourth floor extension to provide amenity space with terrace restaurant and bar. The proposals also include for the conversion of the KOKO dome to a private bar and general refurbishment and restoration to the building*'.

The demolition and construction work may have the potential to impact on local air quality, and this was assessed in accordance with the Mayor's Supplementary Planning Guidance *The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance* (CDECD SPG).

The risk of construction phase impacts was predicted to be a maximum of 'medium' with regard to disamenity and human health during the demolition and construction activities. Mitigation measures are recommended to control the risk, and it is recommended that these are secured by am agreed dust management plan (DMP).

With effective implementation of the mitigation measures, the impacts of the construction work on air quality are likely to be 'not significant'.

The principal air quality impacts associated with the development during the operational phase are likely to be due to increased road transport and building emissions, and the potential for receptors to be introduced into an area of poor ambient air quality.

The site is located within a borough-wide AQMA declared for exceedance of the annual mean NO_2 and daily mean PM_{10} standards. Monitoring data suggest concentrations of PM_{10} are likely to meet the annual mean standard. Diffusion tubes within 2km of the site show widespread exceedance of the annual mean standard for NO_2, and some annual means exceed 60µg/m^3, suggesting exceedance of the hourly mean standard may be likely.

The development is a hotel and music venue, therefore will not introduce exposure relevant to the annual mean NO_2, PM_{10} or $PM_{2.5}$ standards, however the potential may exist for relevant exposure to exceedances of the hourly NO_2 and daily mean PM_{10} standard at locations roadside to busy roads.

The Koko front facade is set back some distance from Camden High Street, and the south, east and north facades are roadside to much smaller roads, Crowndale Road, Bayham Street and Bayham Place respectively. It is therefore unlikely that the hourly mean standard for NO_2 or daily mean standard for PM_{10} would be exceeded at facades other than the Camden High Street facade.

The building will be mechanically ventilated. The auditorium will be served by a supply and extract system drawing air from roof level, mitigating and minimising potential exposure. It should be noted that intakes must not be located where they may be affected by the boiler flue discharge.

The hotel will be served by a mechanical ventilation with heat recovery (MVHR) system whose intakes will be sited on the Bayham Street and Bayham Place facades, where exceedance of the relevant air quality standards is not likely.

It is therefore considered that the proposed development will not increase exposure to air quality not meeting relevant standards.

The development includes embedded best practice mitigation measures to minimise emissions. Space heating will be provided by electric air source heat pumps, and HVAC plant resulting in no local emissions to air. Domestic hot water for the auditorium areas will be provided by point of use electric heaters resulting in no direct emissions. Domestic hot water for the hotel will be provided by two natural gas fired boilers which are low emission ('class 5' NOx emissions) and meet the NOx emissions requirement of <40mgNOx/kWh of the SDC SPG. No standby generator is proposed.

Although the development will be 'car free' and is unlikely to lead to employee off-site parking as the site has excellent public transport and cycling accessibility, some increased road traffic due to taxis and delivery/service vehicles is likely. The transport consultants for the scheme estimate that an additional 65 vehicles (AADT) per day, comprising 22 HGV movements due to delivery and waste collection and of the order of 39 taxi movements may be generated. This traffic generation is well below the indicative criteria proposed in the EPUK-IAQM guidance, therefore a significant impact is not anticipated and further assessment of road traffic exhaust emissions should be required.

Transport and building emissions were estimated according to GLA's Air Quality Neutral Planning Support Update document published in April 2014. The estimates were lower than derived building emissions and transport emissions benchmarks, therefore the development is considered air quality neutral.

A completed London Borough of Camden Air Quality Planning Checklist is presented at Appendix E.

Abbreviations

AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
AQS	Air Quality Standard
CHP	Combined Heat and Power
CHP	Combined heat and power
COL	Corporation of City of London
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EC	European Commission
EPUK	Environmental Protection UK
EU	European Union
GLA	Greater London Authority
GLA AQN	Air Quality Neutral Planning Support guidance
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LBC	London Borough of Camden
LDV	Light duty vehicle
LLAQM TG.16	London Local Air Quality Management Technical Guidance 2016
MOL DG	The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance
NAQS	National Air Quality Strategy
NPPF	National Planning Policy Framework
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
$PM_{2.5}$	Particulate matter of size fraction approximating to <2.5mm diameter
PM_{10}	Particulate matter of size fraction approximating to <10mm diameter
RSK	RSK Environment Limited
SDC SPG	Sustainable Design and Construction Supplementary Planning Guidance
SPG	Supplementary Planning Guidance
TEB	Transport Emissions Benchmark

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APPENDICES

1 INTRODUCTION

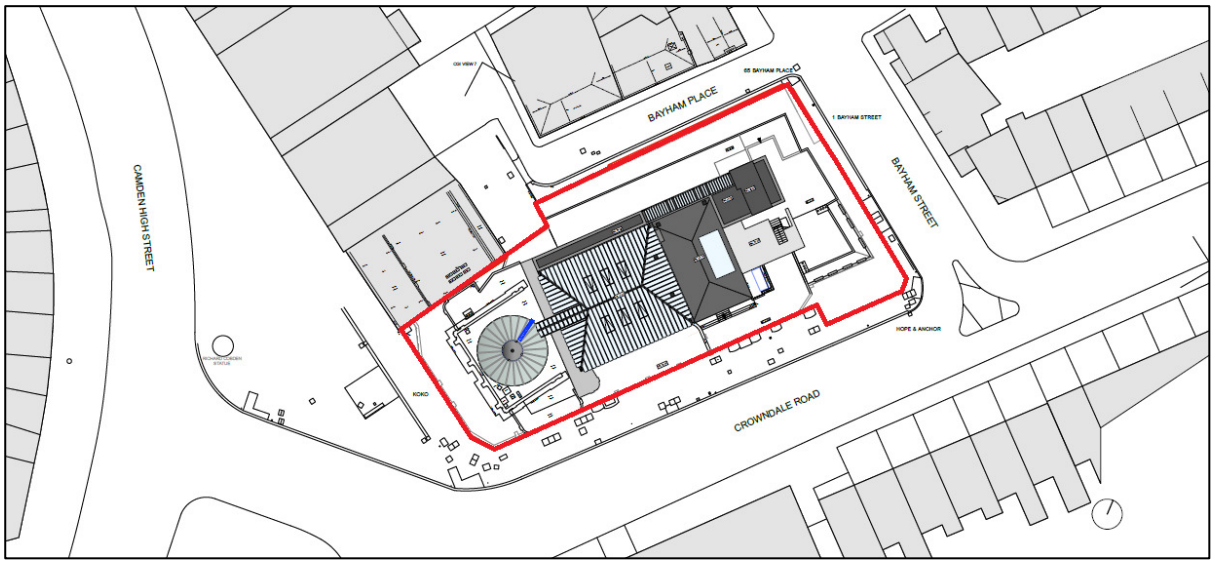
RSK Environment Ltd (RSK) was commissioned to undertake an assessment of potential air quality impacts associated with the proposed redevelopment of KOKO, 65 Bayham Place, 1 Bayham Street and 'The Hope and Anchor' public house, Camden.

The proposed site is located within the jurisdiction of the London Borough of Camden (LBC). The approximate grid reference for the centre of the site is 529222,183400. Figure 1.1 shows the site location and boundary. The site is not within the LBC 'growth areas' or the Central London 'clear zone' therefore it is assumed that the further planning criteria for these areas should not apply.

The proposed development comprises the '*demolition of 65 Bayham Place, 1 Bayham Street (retention of façade) and rebuilding to provide a 32 bedroom boutique hotel with extension to the rear and additional basement; retention and refurbishment of the Hope & Anchor Public House (Use Class A4) to provide restaurant and bar, minor reconfiguration to circulation space within KOKO. Conversion of the flytower for use by the hotel with the retention of the original theatre equipment. Installation of fourth floor extension to provide amenity space with terrace restaurant and bar. The proposals also include for the conversion of the KOKO dome to a private bar and general refurbishment and restoration to the building*'.

This report presents the findings of an assessment of existing/baseline air quality conditions, assesses the impact of the development on local air quality during the construction and operational phases of the development, presents the findings of an 'air quality neutral' assessment, and makes appropriate concluding remarks on any residual air quality impacts.

Figure 1.1: Proposed Development Site Location



2 LEGISLATION, PLANNING POLICY AND GUIDANCE

2.1 Air Quality Strategy

UK air quality policy is published under the umbrella of the Environment Act 1995, Part IV and specifically Section 80, the National Air Quality Strategy. The latest *Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air*, published in July 2007, sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2020.

The EU (European Union) Air Quality Framework Directive (1996) established a framework under which the EU could set limit or target values for specified pollutants. The directive identified several pollutants for which limit or target values have been, or will be set in subsequent 'daughter directives'. The framework and daughter directives were consolidated by Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, which retains the existing air quality standards and introduces new objectives for fine particulates ($PM_{2.5}$).

2.1.1 Air Quality Objectives

The air quality standards (AQSs) in the United Kingdom are derived from European Commission (EC) directives and are adopted into English law via the Air Quality (England) Regulations 2000 and Air Quality (England) Amendment Regulations 2002. The Air Quality Limit Values Regulations 2003 and subsequent amendments implement the EU Air Quality Framework Directive into English Law. Directive 2008/50/EC was translated into UK law in 2010 via the Air Quality Standards Regulations 2010.

The relevant[1] AQSs for England and Wales to protect human health are summarised in Table 2.1. The AQSs present the level to which the standards are expected to be achieved by a certain date.

Table 2.1: Air Quality Objectives Relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit ($\mu g/m^3$)
Nitrogen dioxide (NO_2)	1 calendar year	-	40
	1 hour	18	200
Particles (PM_{10})	1 calendar year	-	40
	24 hours	35	50
Fine particles ($PM_{2.5}$)	1 calendar year	-	25

[1] Relevance, in this case, is defined by the scope of the assessment.

2.1.2 The Environment Act

Local authorities are required to review and assess air quality in their areas under Section 82 of the Environment Act (1995). If exceedances of the air quality objectives are measured or predicted, the local authority must declare an air quality management area (AQMA) and prepare an air quality action plan to outline how air quality is to be improved..

2.2 Planning Policy and Guidance

The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the proposed development, be a material consideration in the determination of planning applications.

2.2.1 National Planning Policy Framework

In March 2012, The National Planning Policy Framework (NPPF) was published, superseding the bulk of previous Planning Policy Statements with immediate effect. The National Planning Policy Framework was intended to simplify the planning system and includes a presumption in favour of sustainable development.

Section 11 of the NPPF deals with Conserving and Enhancing the Natural Environment, and states that the intention is that the planning system should prevent '*development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability*' and goes on to state that '*new development* [should be] *appropriate for its location' and 'the effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account*.'

With specific regard to air quality, the NPPF states that:

'Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'.

2.2.2 Regional Planning Policy

<u>The London Plan, 2011 (incorporating 2016 amendments)</u>

The Mayor of London adopted 'The London Plan' in July 2011 (as amended), which provides a spatial development strategy for Greater London and brought together aspects of the Mayor's other strategies, such as the Mayor's Air Quality Strategy.

Policy 7.14 'Improving Air Quality' specifies that development proposals should have a number of considerations for air quality to achieve a reduction in pollutant emissions and minimise public exposure to pollution.

The policy sets out the following points in relation to planning decisions:

"Development proposals should:

- *minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans;*
- *promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';*
- *ensure that where provision needs to be made to reduce emissions from a development, these usually are made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches;*
- *where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified."*

Sustainable Design and Construction Supplementary Planning Guidance (SDC SPG)

The Sustainable Design and Construction Supplementary Planning Guidance (Mayor of London, 2014), which is herein referred to as the SDC SPG, provides detail on how air quality assessments should be undertaken. It also outlines mitigation measures which can be implemented whilst the development is in operation and sets out the expectations of an air quality neutral assessment, and refers to the 'Air Quality Neutral Planning Support' guidance (Moorcroft et al., 2014).

The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (CDECD SPG)

The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (Mayor of London, 2014), , indicates that dust and particulate matter (PM) generated during the construction phase of the development should be considered as a material consideration in the formation of Local Planning Documents and making planning decisions and outlines a procedure for assessing and mitigating any dust and particulate matter generated during the construction phase.

The Mayor's Air Quality Strategy

The Mayor's Air Quality Strategy outlines a number of measures to improve air quality in London, including using the planning system to reduce emissions from new developments.

2.2.3 Local Planning Policy

LBC Core Strategy

The LBC Core Strategy, adopted in 2010, states that the council will '*..Continue to try to enhance our local environment, for example by reducing air pollution and improving our streets and public spaces.'*

Moreover, the LBC Camden Development Policies Document (published November 2010) was published to supplement the Core Strategy (2010). It states the following:

- *"The Council will take into account impact on air quality when assessing development proposals."*
- *"Where development could potentially cause significant harm to air quality, we require an air quality assessment. Where the assessment shows that a development would cause significant harm to air quality, planning permission will be refused unless mitigation measures are adopted to reduce the impact to acceptable levels."*
- *"Our growth areas of Euston, Kings Cross, Holborn, Tottenham Court Road and West Hampstead (see Core Strategy policy CS2) are located along busy roads and currently experience poor levels of air quality and disturbance from noise. Developments in these areas will need to be well protected against air and noise pollution to ensure they are suitable for occupation".*
- *"The Council will also only grant planning permission for development in the Clear Zone region that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated. We will use planning conditions and legal agreements to secure Clear Zone measures to avoid, remedy or mitigate the impacts of development schemes in the Central London Area."*

LBC Air Quality Action Plan

In addition, LBC approved a final strategy and action plan for air quality in 2016. It details how they plan to make air quality a priority. The Clean Air Action Plan 2016 – 2018 states in regard to new developments:

- Minimise emission from construction and operation of developments by adhering to best practice and planning guidance.
- Developers should adopt measures which will reduce transport emission during the operational phase of the development.

- Undertake air quality assessment where development could have a negative impact on air quality where the development is adjacent to sensitive areas or will introduce new receptors into areas of existing poor air quality.
- Ensure enforcement of Non Road Mobile Machinery (NRMM) air quality polices for new developments.
- Map air quality levels and local health prevalence data with other indicators to support planning processes

The Action Plan also puts emphasis on reducing emissions from transport, requiring local businesses to encourage more sustainable forms of transport through the adoption of travel plans and other policies, to reduce transport emissions.

LBC – Construction Management Plans

LBC requires developers to prepare a Construction Management Plan (CMP), which can help to minimise the impact of construction, both for construction on the site and transport arrangements for servicing. Guidance and requirements for the completion of a CMP can be found on the LBC website.

2.2.4 Guidance Document - Land-Use Planning & Development Control: Planning for Air Quality (Environmental Protection UK and IAQM, 2017)

The EPUK-IAQM guidance includes a method for screening the requirement for an air quality assessment and determining the significance of any air quality impacts associated with a development proposal. The method contained within the guidance is replicated in Appendix B of this document.

3 ASSESSMENT SCOPE AND METHOD

3.1 Overall Approach

The approach taken for assessing the potential air quality impacts of the proposed redevelopment may be summarised as follows:

- characterisation of baseline local air quality;
- qualitative impact assessment of construction phase of the development;
- qualitative impact assessment of operational phase of the development;
- determination of whether the development can be classified as 'air quality neutral'; and,
- Recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

3.2 Baseline Characterisation

Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources.

A desk based study has been undertaken using data obtained from continuous and diffusion tube monitoring stations maintained by LBC. Estimated background data from the LAQM Support website maintained by DEFRA are also included.

3.3 Construction Phase Impact Assessment

Dust and particulate matter (PM) generated during the construction programme may have the potential for an adverse impact on local air quality, and therefore this was assessed in accordance with the 'Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (Mayor of London, 2014), which is herein referred to as the CDECD-SPG.

In order to assess the potential impacts, construction activities are divided into four types:

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

The first step is to screen the requirement for an assessment. An assessment is required where there are human and/or ecological receptors within certain distances of the site.

There are human receptors within 350m of the boundary of the site and within 50m of the trackout route; therefore, construction dust may have the potential to cause annoyance in the local area.

A qualitative construction impact assessment has been conducted to assess the risk of dust impacts and determine appropriate mitigation to adequately control the risk.

This assessment report considers the potential impact from demolition, earthworks, construction and trackout activities. The methodology is presented at Appendix A.

3.4 Operation Phase Impact Assessment

A simple assessment of potential operational phase impacts of the proposed development on local air quality and of local air quality in the proposed development was carried out according to the IAQM-EPUK guidance document '*Land-Use Planning & Development Control: Planning for Air Quality*' (Environmental Protection UK and IAQM, 2017).

Further details of the approach and methodology are presented at Appendix B.

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3.5 Air Quality Neutral Assessment

An air quality neutral assessment was undertaken with reference to the SDC SPG (2014) and the Moorcroft et al. (2014) 'Air Quality Neutral Planning Support' guidance (the GLA AQN guidance). A description of the 'air quality neutral' concept including building and transport emission benchmarks with reference to the SDC SPG is presented in Appendix D.

The approach taken for the air quality neutral assessment for the proposed development may be summarised as follows:

- Estimation of building and transport emissions associated with the development and comparison against a site-specific building emissions benchmark (BEB) and transport emissions benchmarks (TEB); and,
- Recommendations of measures to reduce the total building and transport emissions, where appropriate, in order for the development to be classified as 'air quality neutral' as per the definitions in the guidance documents.

4 BASELINE AIR QUALITY CHARACTERISATION

4.1 Emissions Sources and Key Air Pollutants

Transport-related emissions are one of the main sources of air pollution in urban areas. The principal pollutants relevant to this assessment are considered to be NO_2 and PM_{10}, generally regarded as the two most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions. These pollutants are generally considered to have the greatest potential to result in human health impacts, and are the substances of most concern in terms of existing levels in the area, as discussed below.

4.2 Location of site relative to AQMAs

The proposed development is located within the 'Camden' AQMA, which covers the whole of the local authority area. It was declared due to exceedances of the annual mean NO_2 and daily mean PM_{10} AQSs.

4.3 Baseline Monitoring Data

According to the LBC 2015 Updating and Screening Assessment there were 6 diffusion tubes measuring NO_2 concentrations (for comparison with the annual mean AQS) within 2.0km of the proposed development site. There are also two automatic monitors located within 2km of the site. The concentrations obtained at these monitoring locations during 2014 (the most recent year for which ratified data were available a the time of writing) are reproduced in Table 4.1. Exceedances of the annual mean AQS were measured at all but one of the monitoring locations.

Table 4.1: 2014 Pollutant Concentrations at the Monitoring Locations within the Vicinity of the Proposed Development Site

Site ID	Site Name	Site Type	Approx distance from proposed development (km)	Annual Average NO_2 ($\mu g/m^3$)	Annual Average PM_{10} ($\mu g/m^3$)	No. of 24-hour PM_{10} >50 $\mu g/m^3$	No. of hours NO_2 >200 $\mu g/m^3$
CA23	Camden Road	Roadside	0.7	**72**	-	-	-
CA20	Brill Place	Roadside	0.8	**52**	-	-	-
CD9*	Euston Road	Roadside	1.0	**98**	29	5	**170**
CA10	Tavistock Gardens	Urban Background	1.3	**47**	-	-	-
CA6	Wakefield Gardens	Urban Background	1.5	36	-	-	-
LB*	London Bloomsbury	Urban Background	1.6	**45**	20	11	0
CA16	Kentish Town Road	Roadside	1.7	**58**	-	-	-
CA11	Tottenham Court	Kerbside	1.7	**87**	-	-	-

Site ID	Site Name	Site Type	Approx distance from proposed development (km)	Annual Average NO_2 ($\mu g/m^3$)	Annual Average PM_{10} ($\mu g/m^3$)	No. of 24-hour PM_{10} >50 $\mu g/m^3$	No. of hours NO_2 >200 $\mu g/m^3$
	Road						
Air Quality Standard				**40 (annual mean)**		**35 days >50 $\mu g/m^3$**	**18 hours >200 $\mu g/m^3$**

Notes: Results in bold exceed the relevant AQS. * - Automatic monitoring sites.

4.4 LAQM-Tools Mapped Estimated Background Data

In addition to local monitoring data, estimated background air quality data are available from the LAQM Support website operated by Defra. The website provides estimated annual average background concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$ on a 1 km^2 grid basis. Table 4.3 identifies estimated annual average background NO_x, NO_2, PM_{10} and $PM_{2.5}$ concentrations at the proposed development site for the years 2013 to 2017 (the proposed development opening year). The annual mean AQS for NO_2 was predicted to be exceeded until 2019, after which background concentrations were estimated to be below the annual mean AQS. Exceedances of the annual mean PM_{10} and $PM_{2.5}$ AQSs are not predicted. As background concentrations are predicted to fall with time, concentrations in future years (post-2019) would not be expected to exceed the annual mean standards.

Table 4.3: Estimated Background Annual Average NO_x, NO_2, PM_{10} and $PM_{2.5}$ Concentrations at the Proposed Development Site (2014 to 2016 and 2019) from the LAQM Support website

Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the UK-AIR Website			
	Annual Average NO_X ($\mu g/m^3$)	Annual Average NO_2 ($\mu g/m^3$)	Annual Average PM_{10} ($\mu g/m^3$)	Annual Average $PM_{2.5}$ ($\mu g/m^3$)
2019	67.93	38.71	21.49	15.11
2016	79.34	**43.62**	22.22	15.81
2015	83.14	**45.25**	22.47	16.05
2014	87.65	**47.76**	22.88	16.45
AQS (annual mean)	**N/A**	**40**	**40**	**25***

Notes: Presented concentrations for 1km^2 grid centred on 529500,182500; approximate centre of development site is 529222, 183400; * target objective only.

4.5 Likely Existing 'Baseline' Air Quality at the Site

Concentrations of PM_{10} are likely to meet the annual mean AQS on the basis of the results from the two automatic monitoring stations and the LAQM-Tools estimated background data. The numbers of days exceeding the 24-hour standard for PM_{10} at the two automatic monitoring stations within 2km of the site were within the objective.

None of the diffusion tube sites is likely to be fully representative of conditions at Koko, however the diffusion tubes at roadside locations within 2km of the site show widespread exceedance of the annual mean standard for NO_2,

Box 5.2 of DEFRA guidance on Local Air Quality Management LAQM TG-16 advises that '*For diffusion tube monitoring, it can be considered that exceedances of the NO_2 1-hour objective may occur at roadside sites if the annual mean is above 60µg/m^3*'. A number of the diffusion tubes returned annual mean NO_2 results exceeding 60µg/m^3, suggesting exceedance of the hourly mean standard may be likely, however these are roadside to busy roads, whilst the Koko front facade is set back some distance from Camden High Street, and the south, east and north facades are roadside to Crowndale Road, Bayham Street and Bayham Place respectively and it is therefore likely that the hourly mean standard for nitrogen dioxide is met at the facades other than the Camden High Street facade.

5 AIR QUALITY IMPACT ASSESSMENT

5.1 Construction Phase

Atmospheric emissions from construction activities will depend on a combination of the potential for emissions (the type of activity and prevailing conditions) and the effectiveness of control measures. In general terms, there are two sources of emissions that will need to be controlled to minimise the potential for adverse environmental effects:

- exhaust emissions from site plant, equipment and vehicles; and,
- fugitive dust emissions from site activities.

5.1.1 Exhaust Emissions from Plant and Vehicles

The operation of vehicles and equipment powered by internal combustion engines results in the emission of exhaust gases containing the pollutants NOx, PM_{10}, volatile organic compounds, and carbon monoxide. The quantities emitted depend on factors such as engine type, service history, pattern of usage and fuel composition. The operation of site equipment, vehicles and machinery will result in emissions to atmosphere of exhaust gases, but such emissions are unlikely to be significant, particularly in comparison with levels of similar emission components from vehicle movements on the local road network surrounding the development site.

5.1.2 Fugitive Dust Emissions

Fugitive dust emissions arising from construction activities are likely to be variable in nature and will depend upon the type and extent of the activity, soil type and moisture, road surface conditions and weather conditions. Periods of dry weather combined with higher than average wind speeds have the potential to generate more dust.

Construction activities that are considered to be the most significant potential sources of fugitive dust emissions are:

- earth moving, due to the handling, storage and disposal of soil and subsoil materials;
- construction aggregate usage, due to the transport, unloading, storage and use of dry and dusty materials (such as cement and sand);
- movement of heavy site vehicles on dry or untreated haul routes; and,
- Movement of vehicles over surfaces where muddy materials have been transferred off-site (for example, on to public highways).

Fugitive dust arising from construction activities is mainly of a particle size greater than the PM_{10} fraction (that which can potentially impact upon human health); however, construction activities may contribute to local PM_{10} concentrations. Appropriate dust control measures can be highly effective for controlling emissions from potentially dust

generating activities identified above, and adverse effects can be greatly reduced or eliminated.

5.1.3 Potential Dust Emission Magnitude

With reference to the CDECD-SPG criteria outlined in Appendix A, the estimation of dust emissions magnitudes for demolition, earthworks, construction and trackout activities are presented in Tables 5.1, 5.2, 5.3 and 5.4. and summarised in Table 5.5.

Partial demolition only of an existing masonry structure is proposed, without on-site crushing, at a maximum of 10-20m above ground, potentially in the summer months, leading to a conservative dust emissions class estimate for demolition of 'Medium', as presented in Table 5.1, below.

Table 5.1: Summary of Dust Emissions Magnitude of Earthworks Activities (Before mitigation

Demolition Criteria	Dust Emissions Class	Basis of Classification
Total volume of buildings to be demolished	Small	<20,000m³
On-site crushing and screening proposed	Small	No on-site crushing and screening
Height of demolition activities	Medium	10-20m above ground
Potential for dusty materials	Medium	Potentially dusty material
Work times	Medium	Summer months
Overall Rating	**Medium**	**Conservative**

The site is small and largely occupied by existing buildings, so the proposed earthworks are limited. Fewer than 5 earth moving plant are likely to be in use at any one time, and although the soil is likely to have a significant clay content, no bunds are proposed and the quantity of earth moved is likely to be <20,000 tonnes leading to a dust emissions class estimate for earthworks of 'small', as presented in Table 5.2, below.

Table 5.2: Summary of Dust Emissions Magnitude of Earthworks Activities (Before mitigation)

Earthworks Criteria	Dust Emissions Class	Basis of Classification
Total site area	Small	Less than 2,500m²
Soil type	Small	Clay
Earth moving vehicles at any one time	Small	Less than 5
Height of bunds	Small	No Bunds
Total material moved	Small	Less than 20,000 tonnes
Work times	Small	Wetter months
Overall Rating	**Small**	

The total build volume is <25,000m3, and although some masonry construction is likely, no batching or sandblasting is proposed, leading to a 'Medium' dust emissions magnitude assessment for construction., as presented in Table 5.3, below.

Table 5.3: Summary of Dust Emissions Magnitude of Construction Activities (Before mitigation)

Construction Criteria	Dust Emissions Class	Basis of Classification
Total building volume	Small	<25,000m^3
On-site concrete batching or sandblasting proposed	Small	No batching or sandblasting
Dust potential of construction materials	Medium	Some concrete and masonry construction
Overall Rating	**Medium**	**Conservative**

The site area is small and the surface is covered with existing buildings, with no unpaved roads, and the number of HDV visiting site day is likely to be fewer than 10, therefore the trackout dust emissions magnitude is assessed as 'Low', as presented in Table 5.4, below.

Table 5.4: Summary of Dust Emissions Magnitude of Trackout Activities (Before mitigation)

Trackout Criteria	Dust Emissions Class	Basis of Classification
Number of heavy duty vehicles (HDV) >3.5t per day	Small	Assumed <10 per day
Surface type of the site	Small	Some clay soil but mostly renovation
Length of unpaved road	Small	<50m
Overall Rating	**Low**	

The dust emissions classes are summarised in Table 5.5, below.

Table 5.5: Summary of Dust Emission Magnitudes (Before mitigation)

Construction Activities	Dust Emissions Class
Demolition	Medium
Earthworks	Small
Construction	Medium
Trackout	Small

5.1.4 Sensitivity of the Area

The sensitivity of the recieving area was be determined by reviewing the number of 'high', 'medium' and 'low' sensitivity human and ecological receptors within progressively increasing distances from the site (for construction and earthworks) and any routes along which trackout is likely to occur, in accordance with the CDECD-SPG.

Figure 5.1 shows a map indicating the construction buffers for identifying the sensitivity of the area and Table 5.6 presents the determined sensitivity of the area with the factors itemised which have helped to define this.

Construction activities are relevant up to 100m from the proposed development site boundary whereas trackout activities are considered relevant up to 50m from the edge of roads within 50m of the site boundary..

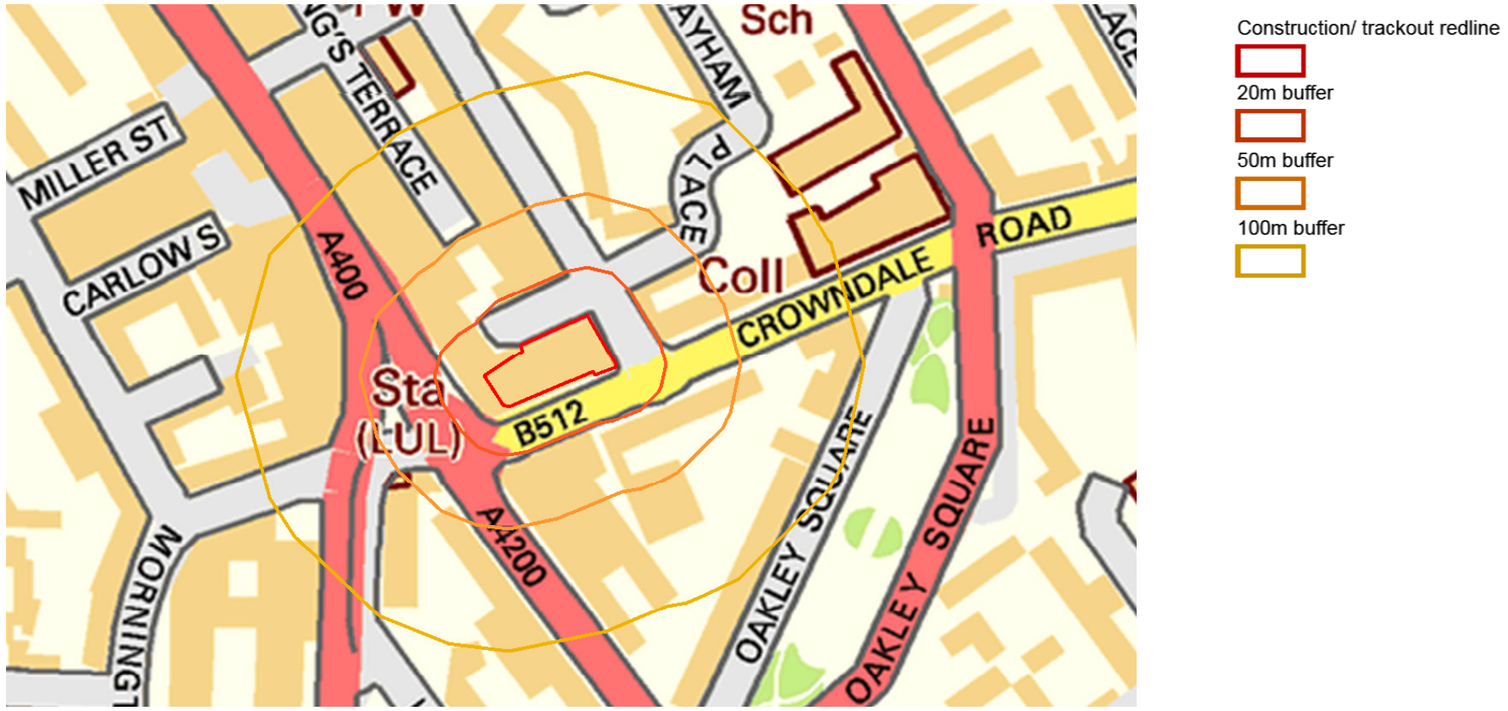
Dwellings are considered 'high sensitivity' receptors for dust soiling and human health. Using the buffer maps presented at Figure 5.1, it was estimated that there are likely t9o be between 10 and 100 dwellings within 20m of the site boundary and 50m of the track out route, leading to a 'high' sensitivity assessment for dust soiling, and assuming a conservative likely existing PM_{10} concentration of 24-28µg/m^3, a 'high' sensitivity to PM_{10}.

No designated ecologically sensitive receptors within 350m of site boundary or track out route, therefore the sensitivity of the area to ecological impacts is 'negligible'. .

Table 5.6: Sensitivity of the area

Potential Impact		Sensitivity of the surrounding area	
		Earthworks and Construction	Trackout
Dust soiling	Receptor sensitivity	High	High
	Number of receptors	10-100	10-100
	Distance from the source	20m	50m
	Sensitivity of the area	**High**	**High**
Human health	Receptor sensitivity	High	High
	Annual mean PM_{10} concentration	24-28µg/m^3	24-28µg/m^3
	Number of receptors	10-100	10-100
	Distance from the source	20m	50m
	Sensitivity of the area	**High**	**High**
Ecological	Receptor sensitivity	No designated ecologically sensitive receptors within 50m of site boundary or track out route.	
	Distance from the source		
	Sensitivity of the area	**Low**	**Low**

Figure 5.1: Construction Activities Buffer Map



5.1.5 Risk of Impacts

The dust emission magnitudes summarised in Table 5.5 were combined with the sensitivity of the area summarised in Table 5.6, to determine the risk of impacts of construction activities before mitigation, as identified in Table 5.7.

Site-specific mitigation measures to reduce the 'medium' construction phase and demolition phase risk of impact identified for general site activities are detailed in Appendix C.

Table 5.7: Summary of the Dust Risk from Construction Activities

Potential Impact		Dust Risk Impact		
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Medium Risk	Low Risk	Medium Risk	Low Risk
Human health	Medium Risk	Low Risk	Medium Risk	Low Risk
Ecological	Negligible	Negligible	Negligible	Negligible

5.2 Qualitative Operational Phase Assessment

As indicated in section 3.4, the principal air quality impacts associated with the development are likely to be the impact of the proposed development on local air quality, and the impact of the poor local ambient air quality on the proposed development.

5.2.1 Impact of Ambient Air Quality on Development

As indicated in section 4.6, ambient air quality at the proposed development is likely to meet the long and short term standards for PM_{10} and $PM_{2.5}$, and although there may be a risk of exceedance of the hourly mean standard for nitrogen dioxide at the Camden High Street facade, the Crowndale Road, Bayham Street and Bayham Place facades are unlikely to exceed this standard. The annual mean standard for NO_2 is likely to be exceeded. .

The London Local Air Quality Management Technical Guidance (2016) (LLAQM TG.16) indicates that the annual mean NO_2 and PM_{10} AQSs should not be applied to hotels, unless people live there as their permanent residence, which is not proposed in this case.

The daily and 8-hour mean and 1-hour mean AQSs apply to the development..

It is not considered that the development would introduce exposure relevant to the annual mean NO_2, PM_{10} or $PM_{2.5}$ AQSs, though there is a risk that exposure to exceedances of the short term NO_2 AQSs could be increased at the Camden High Street facade only, if unmitigated.

5.2.2 Impact of Development on Local Air Quality

To assess the impacts of the development on existing air quality during the operational phase of the development, the development was compared with the screening criteria in section 6 of the EPUK-IAQM guidance.

The development includes more than 1,000m^2 of floor space and therefore exceeds the screening criteria set out in Table 6.1 of the EPUK-IAQM guidance (as reproduced in Appendix B).

The proposed development is 'car free', and is unlikely to lead to employee off-site parking as the site has excellent public transport and cycling accessibility, however the transport consultants for the scheme, ADL Limited, estimated the vehicle movements associated with the development (with reference to the TRAVL database for developments with little or no on-site parking). They identified that the development would be expected to generate an additional 65 vehicles (when expressed as a 2-way AADT flow) per day, comprising 22 heavy goods vehicle movements due to delivery and waste collection and of the order of 39 taxi movements. This traffic generation is well below the indicative criteria proposed in the EPUK-IAQM guidance, therefore a significant impact is not anticipated and further assessment of road traffic exhaust emissions should not be indicated.

It is understood that combined heat and power (CHP) or other significant point sources of emissions to air are not proposed. Space heating for the hotel will be provided by electric driven air source heat pumps, and heating and cooling for the music venue will be electric, via a mechanical heating, ventilation and air conditioning (HVAC) system, neither of which will lead to direct local emissions to air. Hot water for the music venue will be provided by electric point of use water heaters and will not lead to local emissions to air.

Domestic hot water for the hotel will be provided by two gas boilers. The units specified are 'BFC (50) Cyclone' efficient, natural gas fuelled condensing glass-lined water heaters with a combined thermal input of 104kWh, and are rated 'NOx Emissions Class 5', with NOx emissions of 36mg/kWh, which complies with the SDC SPG requirement that individual and/or communal gas boilers should achieve a NOx rating of <40 mgNOx/kWh. The boilers will discharge a via single flue terminating 600mm above the roof.

No standby emergency generator is planned.

Table 5.7 below reproduces the further screening criteria from Table 6.2 of the EPUK-IAQM guidance, and compares the proposed development with them.

Table 5.7: Significance of the Potential Operation Phase Impacts With Reference to the Criteria Suggested in Environmental Protection UK-IAQM Guidance

Indicative Criteria to Proceed to an Air Quality Assessment	Comparison to the screening criteria identified and explanation
A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.	No – the additional AADT is 39 additional vehicle movements (generally Taxis) – see below.
A Change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	No – it is understood that 22 additional HGV movements are anticipated.
Road realignment, where the change is 5m or more and the road is within an AQMA.	No – there is no on-site parking and road realignment will not be affected.
Introduction of a new junction or the removal of an existing junction near to relevant receptors. This applies to junctions that cause traffic to significantly change vehicle accelerate/ decelerate, e.g. traffic lights, or roundabouts.	No – there are no plans for a new junction or existing junction to be removed.
Introduction or change of a bus station, where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.	No – it is not anticipated that the development would introduce any additional bus routes.
Have an underground car park with extraction system, where the ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).	No – no on-site parking is proposed.
Having one or more substantial combustion process, where the combustion unit is: - any centralised plant using bio fuel - any combustion plant with single or combined thermal input >300kWh - a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year).	No – 2 Condensing Glass-Lined Water heater with a combined thermal input of 104kWh. No standby emergency generator planned.
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/seca is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion.	No – the combined boiler capacity of104Kw leads to a NOx emission rate of 1mg/s. Discharge a via single flue terminating 600mm above the roof level, likely to give good dispersion.

The indicative screening criteria in Table 5.7 above are not exceeded, therefore it is considered unlikely that the impact of the development on local air quality will be significant.

5.3 Air Quality Neutral Assessment

5.3.1 Building Emissions Benchmark Calculations

Building Emissions Calculations

The mechanical engineers for the scheme, Ralph T. King and Associates (RKA), have indicated that the only source of on-site combustion emissions will be 2 condensing water heater boilers.

The BFC (50) Cyclone Condensing Glass-Lined Water Heater is the make and model of boiler that has been selected for the development. The specification states that each boiler will have a thermal input of 52.2mg/kWh. As a conservative estimate it has been assumed that the boilers will be in operation for 24 hours a day for a full year. .

The gas-fired boiler will not produce significant PM_{10} emissions and therefore PM_{10} not been assessed. The estimated annual NOx emissions from the boiler, based on the above parameters, are provided in Table 5.8.

Table 5.8: Annual NO_x emissions from Combustion Sources

Source	Number of units	Operation (hour/annum – conservative estimate)	Input (kW)	Emission rate (mg/kWh)	Total Annual NOx (kg/annum), both units
BFC Cycolne Condensing Glass-Lined Water Heater	2	8,760	52.2	36	32.92

Building benchmark calculations

The NOx BEBs of 70.9g/m^2 for a C1 development and 90.3g/m^3 for a D2 development referenced in the GLA AQN Guidance were used in this calculation and multiplied by the respective gross internal areas of the development. The calculated benchmarked building NO_x emission for the proposed development has been determined to be 631.3kg/annum, as shown in Table 5.9.

Table 5.9: Calculation of Benchmarked NO_x Emissions using the relevant BEBs for each Land-Use Category

Land use type	GFA (m^2)	NOx Building Emissions Benchmark (gNOx/m^2/annum)	NOx Building Emissions Benchmark (kg/annum)
D2 (Assembly and leisure)	3,485	90.3	314.7
C1 (Hotel)	4,466	70.9	316.6

The development emissions of 32.92 kg NO_x/annum are significantly below the BEB for and therefore the development is considered as 'air quality neutral' from a building emissions perspective.

5.3.2 Transport Emissions

According to the Content Travel Demand Survey referenced in the air quality neutral assessment, the proposed development is located in inner London and the assessment has therefore used the inner London emissions factors specified in the guidance.

Transport emission calculations

The proposed development is 'car free' but transport consultants for the scheme provided estimated two-way vehicle movement flows for taxi journeys, as outlined in section 5.2. Average trip length data are not provided for the land-use classes of the proposed development therefore surrogate TEBs based on trip rates have been used, as suggested by the guidance.

The transport trip rates calculations for the development are summarised in Table 5.10 below. The total number of trips (trips/m^2/annum) was estimated by dividing the total number of trips per annum by the area of each land use class, as defined in the air quality neutral guidance. For a conservative estimate the total number of trips for the development as a whole was used for each land-use class, in reality these figures would be lower. HGV movements were not included as the development is not classed as retail or distribution.

Table 5.10: Calculation of Transport Emissions associated with each Land-Use Category

Land use type	No. trips per annum (in AADT)	Total trips per annum	GIA (m^2)	No. Of trips (trips/m^2/annum)
C1	39*	14,235	4,466	3.2
D2	39*	14,235	3,485	4.1

* Worst case assumption that total traffic derived from each land-use class

Transport benchmark calculations

The transport benchmark trip rates are used for land-use classes where it is not possible to derive trip lengths (see Appendix D). The transport benchmark for the development can be calculated by multiplying the average annual trip rate by the gross internal area (m^2) for each land-use class. The calculations are shown in Table 5.11 below.

Table 5.11: Transport Emissions Benchmarks associated with each Land-Use Category

Type of area	GIA (m^2)	Average Number of Trips for Land-use Class (trips/m^2/annum)	Transport Benchmark Trip Rate (trips/annum)
C1	4,466	5.0	22,330
D2	3,485	22.5	78,412.5

Comparison of Transport Trip Rates with Transport Trip Rates Benchmarks

The estimated development trips per annum are well below the transport trip rate benchmarks with conservative trip estimates and therefore further action is not considered to be required in order for the development to be classified as 'air quality neutral' from a transport emissions perspective.

6 MITIGATION MEASURES

6.1 Construction Phase Mitigation

The dust emitting activities outlined in section 5.1 can be effectively controlled by appropriate dust control measures and any adverse affects can be greatly reduced or eliminated. The dust risk categories identified have been used to define appropriate, site-specific mitigation methods, which are detailed in Appendix C.

Prior to commencement of construction activities, it is recommended that an agreement on the scope of a dust management plan (DMP) or similar for the construction phase will be reached with the local authority to ensure that the potential for adverse environmental effects on local receptors is minimised. The DMP should include *inter alia*, measures for controlling dust and PM from site construction operations as outlined at Appendix C, and recommendations for reactive monitoring, to ensure the continued effectiveness of recommended dust and PM mitigation measures.

6.2 Operational Mitigation – Air Quality

The building is set back from the Camden High Street facade,

It is understood that the building will be mechanically ventilated. The auditorium will be served by a supply and extract HVAC system drawing air from roof level. Drawing air from roof level will minimise pollutant concentrations and mitigate potential exposure.

Care must be taken that intakes are not located where they may be affected by the boiler flue discharge.

Each floor of the hotel will be served by mechanical ventilation with heat recovery (MVHR) system. The intakes for these systems will be sited on the Bayham Street and Bayham Place facades, where exceedance of the relevant air quality standards is not likely.

It is therefore considered that the proposed development will not increase exposure to air quality not meeting relevant standards.

The development includes a number of best practice embedded mitigation measures to minimise emissions. It will be ‘car free’, and space heating will be provided by electric air source heat pumps, and HVAC plant resulting in no local emissions to air. Domestic hot water will be provided by point of use electric heaters resulting in no direct emissions. Domestic hot water for the hotel will be provided by two natural gas fired boilers, however the specified units efficient, low emission (‘class 5’ NOx emissions) and meet the NOx emissions of <40mgNOx/kWh required by the SDC SPG,

7 CONCLUSIONS

A ‘simple’ air quality assessment for the proposed development at KOKO, 65 Bayham Place, 1 Bayham Street and The Hope and Anchor Public House, Camden, has been prepared with reference to existing air quality in the area and relevant air quality legislation, policy and guidance.

The demolition and construction work may have the potential to impact on local air quality, and this was assessed in accordance with the CDECD SPG. The potential risk of construction phase impacts was predicted to be a maximum of ‘medium’ with regard to disamenity and human health during the demolition and construction activities.

Mitigation measures are recommended to reduce the risk, and it is recommended that these are secured by a dust management plan (DMP). With effective implementation of the mitigation measures, the impacts of the construction work on air quality are likely to be ‘not significant’.

The principal air quality impacts associated with the development during the operational phase are likely to be due to increased road transport and building emissions, and the potential for receptors to be introduced into an area of poor ambient air quality.

The site is located within a borough-wide AQMA declared for exceedance of the annual mean NO_2 and daily mean PM_{10} standards. Monitoring data suggest concentrations of PM_{10} are likely to meet the annual mean AQS, however diffusion tubes within 2km of the site show widespread exceedance of the annual mean standard for NO_2, and some annual means exceed 60µg/m^3, suggesting exceedance of the hourly mean standard may be likely.

The development is a hotel and music venue, therefore will introduce exposure relevant to the annual mean NO_2, PM_{10} or $PM_{2.5}$ AQSs, however the potential may exist for relevant exposure to exceedences of the hourly NO_2 and daily mean PM_{10} standard at locations roadside to busy roads.

The Koko front facade is set back some distance from Camden High Street, and the south, east and north facades are roadside to much smaller roads, Crowndale Road, Bayham Street and Bayham Place respectively and it is therefore unlikely that the hourly mean standard for nitrogen dioxide or daily mean standard for PM_{10} would be exceeded at facades other than the Camden High Street facade.

The building will be mechanically ventilated. The auditorium will be served by a supply and extract system drawing air from roof level, mitigating and minimising potential exposure. It should be noted that intakes must not be located where they may be affected by the boiler flue discharge.

The hotel will be served by mechanical ventilation with heat recovery (MVHR) system. whose intakes will be sited on the Bayham Street and Bayham Place facades, where exceedance of the relevant air quality standards is not likely.

It is therefore considered that the proposed development will not increase exposure to air quality not meeting relevant standards.

The development includes a number of best practice embedded mitigation measures to minimise emissions. Space heating will be provided by electric air source heat pumps, and HVAC plant resulting in no local emissions to air. Domestic hot water for the auditorium areas will be provided by point of use electric heaters resulting in no direct emissions. Domestic hot water for the hotel will be provided by two natural gas fired boilers which are, low emission ('class 5' NOx emissions) and meet the NOx emissions of <40mgNOx/kWh required by the SDC SPG. No standby generator is proposed.

Although the development will be 'car free' and is unlikely to lead to employee off-site parking as the site has excellent public transport and cycling accessibility, the transport consultants for the scheme estimate that an additional 65 vehicles (AADT) per day, comprising 22 HGV movements due to delivery and waste collection and of the order of 39 taxi movements may be generated. This traffic generation is well below the indicative criteria proposed in the EPUK-IAQM guidance, therefore a significant impact is not anticipated and further assessment of road traffic exhaust emissions should not be required.

Transport and building emissions were estimated according to GLA's Air Quality Neutral Planning Support Update document published in April 2014. The estimates were lower than derived building emissions and transport emissions benchmarks, therefore the development is considered air quality neutral.

A completed London Borough of Camden Air Quality Planning Checklist is presented at Appendix E.

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APPENDIX A
CONSTRUCTION DUST ASSESSMENT METHODOLOGY

To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based upon the MOL DG. The assessment follows the steps recommended in the guidance.

Step 1 and Step 2 methods from the MOL DG are described in this Appendix to assign dust risk categories for each of the construction activities.

Step 1: Screen the requirement for assessment

The first step is to screen out the requirement for a construction dust assessment, this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

- a 'human receptor' within:
    - 350m of the boundary of the site; or
    - 50m of the route used by construction vehicles on the public highway, up to 500m from the site entrance(s).
- an 'ecological receptor':
    - 50m of the boundary of the site; or
    - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total building volume >50,000m^3, potentially dusty construction material, on-site crushing and screening, demolition activities >20m above ground level;
- **Medium**: Total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10m – 20m above ground level; and,
- **Small**: Total building volume <20,000m^3, construction material with low potential for dust release, demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total site area >10,000m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes;

- **Medium**: Total site area 2,500 – 10,000m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes; and,
- **Small**: Total site area < 2,500m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <10,000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: Total building volume >100,000m^3, piling, on site concrete batching;
- **Medium**: Total building volume 25,000 – 100,000m^3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching; and,
- **Small**: Total building volume <25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: >100 HDV (3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium**: 25 – 100 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and,
- **Small**: <25 HDV (<3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following factors:

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

Table A1 has been used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table A1: Sensitivity of the Area Surrounding the Site

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	• Users can reasonably expect an enjoyment of a high level of amenity. • The appearance, aesthetics or value of their property would be diminished by soiling. • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day) • Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	• Locations with an international or national designation *and* the designated features may be affected by dust soiling. • Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • Examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home. • The appearance, aesthetics or value of their property could be diminished by soiling. • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Examples include parks and places of work.	• Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	• Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. • Locations with a national designation where the features may be affected by dust deposition. • Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	• The enjoyment of amenity would not reasonably be expected. • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.	• Locations with a local designation where the features may be affected by dust deposition. • Example is a local Nature Reserve with dust sensitive features.

Based on the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. Tables A2 to A4 indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the guidance, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table A2: Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distances from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3: Sensitivity of the area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Conc.	Number of Receptors	Distances from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/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*	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note: The IAQM guidance recommends a further breakdown of 'medium risk' categories, although these are less conservative and have therefore not been utilised in this assessment.

Table A4: Sensitivity of the area to Ecological Impacts

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

Step 2C: Defining the Risk of Impacts

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. Tables A5 to A7 indicate the method used to assign the level of risk for each construction activity.

Table A5: Risk of Dust Impacts from Demolition

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

Table A6: Risk of Dust Impacts from Earthworks/Construction

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

Table A7: Risk of Dust Impacts from Trackout

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

APPENDIX B
OPERATION IMPACT ASSESSMENT METHODOLOGY

This appendix contains the methodology used in the assessment for the operational impact assessment to include reference to EP-UK & IAQM guidance.

The EPUK & IAQM guidance makes reference to the Town and Country Planning (Development Management Procedure) Order (England) 2010 [(Wales) 2012] definition of a 'major' development when scoping assessments required for the planning process. A 'major' development includes developments where:

- The number of dwellings is 10 or above;
- The residential development is carried out of a site of more than 0.5ha where the number of dwellings is unknown;
- The provision of more than 1,000m^2 commercial floorspace; or,
- Development carried out on land of 1ha or more.

Consideration of air quality impacts and approaches to reduce impacts from any 'major' developments is therefore recommended.

There are two aspects of air quality impact to be considered:

- The impact of existing sources in the local area on the proposed development (governed by background pollutant levels and proximity to sources of air pollution); and,
- The impacts of the proposed development on the local area.

With regard to the changes in air quality or exposure to air pollution, the guidance indicates that each local authority will be likely to have their own view on the significance of this; these are to be described in relation to whether an air quality objective is predicted to be met, or at risk of not being met. Exceedances of these objectives are considered as **significant** if not mitigated.

As part of the impact of the proposed development on the local area, a two-staged assessment is recommended as per guidance.

Stage 1: Determines whether an air quality assessment is required. Requires any of the criteria under (A) coupled with any of the criteria under (B) in Table B1 to apply to be required to proceed to Stage 2.

Stage 2: Where an assessment is deemed to be required, this may take the form of a Simple Assessment or a Detailed Assessment, taking reference to the criteria in Table B2.

Table B1: Stage 1 Criteria to proceed to Stage 2

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

Table B2: Indicative Criteria for Requiring an Air Quality Assessment

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors.	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes.	Where the combustion unit is: - any centralised plant using bio fuel - any combustion plant with single or combined thermal input >300kWh - a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year).
8. Have a combustion process of any size.	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way or their size and/or height.

APPENDIX C
SITE-SPECIFIC MITIGATION MEASURES

Site-specific mitigation measures are divided into general measures, applicable to all sites and measures specific to earthworks, construction and trackout. Depending on the level of risk assigned to each site, different mitigation is assigned. The method of assigning mitigation measures as detailed in the MOL DG has been used. In addition, any additional mitigation measures required in the Southwark (2016) guidance have been referred to.

For those mitigation measures that are general, the highest risk assessed has been applied. In this case, the 'High risk' site mitigation measures have been applied, as determined by the dust risk assessment in Section 8. Two categories of mitigation measure are described in the MOL DG – 'highly recommended' and 'desirable', which are indicated according to the dust risk level identified in Table 6.6. Desirable measures are presented in *italics*. Measures taken from the Southwark (2016) guidance and which are not replicated in the MOL DG have been underlined.

Best Practice will be used to control potential fugitive emissions from the construction project, therefore the measures listed below, whether cited as 'highly recommended' or 'desirable' in the MOL DG, will be applied on/ around site.

Site management

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Develop a Dust/Air Quality Management Plan.
- Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary.
- Display the head or regional office contact information.
- Record and respond to all dust and air quality pollutant emissions complaints.
- Make a complaints log available to the local authority when asked.
- Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.
- Regular checks for dust soiling should be carried out within 100m of the site boundary, with wet cleaning methods used where and when visible dust deposition is identified.
- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.
- Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary (i.e. all construction sites for 'major' developments in Southwark), to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.

Preparing and maintaining the site

- Plan site layout: machinery and dust causing activities should be located away from receptors.
- Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.
- Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Where possible, site them with due regard to prevailing wind direction – anticipated to be south-westerly (see figure C1 below).
- Store fine materials (i.e. under 3mm in diameter) in buildings or enclosures.
- *Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution.*
- Reuse hard core material to avoid unnecessary vehicle trips.
- Avoid site runoff of water or mud.
- Keep site hoarding, fencing, barriers and scaffolding clean using wet methods.
- Remove materials from site as soon as possible.
- Cover, seed, fence or compact stockpiles to prevent wind whipping, where practicable. They should also be graded and keep them securely sheeted. Alternatively, irrigators could be used, or long term stockpiles could be re-vegetated or turfed.
- Require a change of shoes and clothes by staff and visitors before leaving site. Personal cleaning facilities such as boot cleaners and showers should also be provided.
- *Agree monitoring locations with the Local Authority.* All major sites require continuous monitoring and therefore it is anticipated that such a monitoring programme would be adopted. The type and nature of monitoring should necessarily be identified in a DMP following planning approval.
- *Where possible, commence baseline monitoring at least three months before phase begins.*
- Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.

Operating vehicle/machinery and sustainable travel

- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone.
- Ensure all non-road mobile machinery comply with the standards set within the MOL DG.
- Ensure all vehicles switch off engines when stationary – vehicles should not idle for more than one minute.
- 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 5mph on surfaced haul routes and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).

- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- All light goods and heavy duty vehicles servicing sites should meet the 'Euro 6' standards specified under the requirements of Regulation (EC) No 715/2007 of The European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information have been transposed into The Motor Vehicles (EC Type Approval) (Amendment) Regulations 2008, which have amended the Motor Vehicles (EC Type Approval) Regulations 1998.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Operations

- Cutting, grinding and sawing should not be conducted on-site and pre-fabricated, pre-cut materials and modules should be brought to site. Where this is not practicable, only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).
- Use enclosed chutes, conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- Reuse and recycle waste to reduce dust from waste materials
- No bonfires or burning of waste materials.

Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces, where practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil.
- Only remove secure covers in small areas during work and not all at once.

Specific to Construction

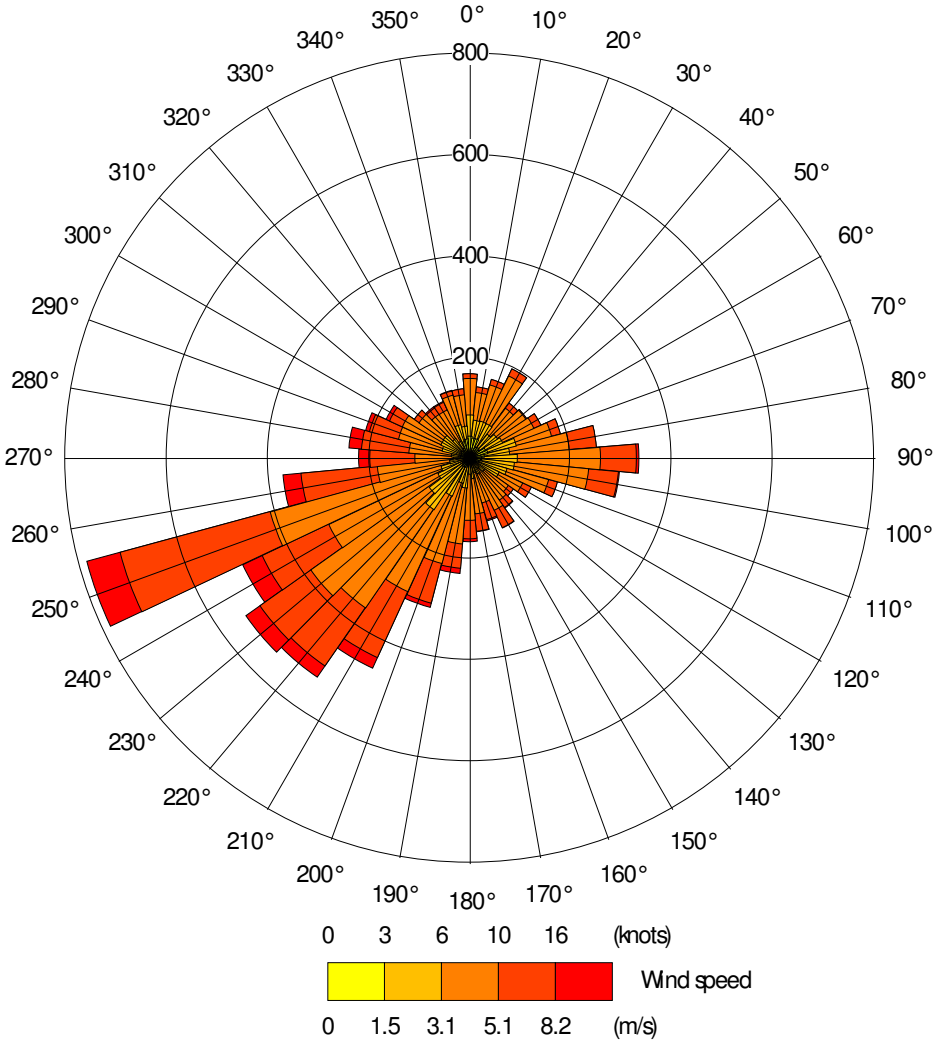
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

- *Avoid scabbling (roughening of concrete surfaces) if possible.* Any scabbling undertaken should involve pre-cleaning wet surfaces, screening work areas, and wet sweeping any arisings generated.
- *Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.*
- *For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.*

Specific to Trackout

- All vehicles entering and leaving site should be covered.
- Regularly use a water-assisted dust sweeper on the access and local roads (including road edges), as necessary, to remove any material tracked out of the site.
- Use wet cleaning methods and mechanical road sweepers on all roads within 100m of the site entrance at least once a day.
- Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul roads/ areas (where applicable), which are regularly damped down with fixed or mobile sprinkler systems and regularly cleaned, to prevent debris from accumulating.
- Inspect haul routes (where applicable) for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. They should also be cleaned daily.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.
- Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.

Figure C1: Windrose for 2014 data collected at London City Airport Meteorological Monitoring Station



APPENDIX D
AIR QUALITY NEUTRAL ASSESSMENT

Emission Standards

There are minimum standards outlined in the SDC SPG provided for gas boilers, biomass boilers and combined, heat and power (CHP) plants. For Ultra Low NO_x boilers, (either individual or communal) installed in residential and commercial buildings, they should achieve a NO_x rating of <40mgNO_x/kWh; these types of boilers are now standard for many developers.

Emission standards have been produced for developments that fall into two different tiers, Band A and Band B, shown in Table D1. The emission standards are to reduce the NO_x and PM_{10} emissions from new developments in London; CHP plants and biomass boilers are to comply with these set standards as well as the development as a whole meeting the 'air quality neutral' benchmarks. An air quality neutral assessment can predict that air quality will be affected as a result of the proposed development, even if emissions standards are met, and in these circumstances additional mitigation would be required for offsetting purposes. Table D2 presents the emission standards applicable to the development proposals and the likely techniques which would be required to meet emission standards, as replicated from the SPG.

Table D1: Proposed Development Baseline Air Quality Tiers

Band	Applicable Range	
	Baseline annual mean NO_2 and PM_{10}	Baseline 24-hour mean PM_{10}
Band A	>5% below national objective	>1-day less than national objective
Band B	Between 5% below or above national objective	1 day below or above national objective

Source: Sustainable Design and Construction SPG (2014)

Table D2: NOx Emission Standards for Boiler (Band B) Applicable to the Proposals

Combustion Appliance	Emission standard at reference O_2 (mg/Nm^3)	Equivalent concentration at 0% O_2 (mg/Nm^3)	Likely technique required to meet emission standards
Spark ignition engine (natural gas/biogas)	95	125	Selective Catalytic Reduction (SCR) – lean burn engines Non-Selective Catalytic Reduction (NSCR) -rich burn engines)

Source: Sustainable Design and Construction SPG (2014)

Application of the Air Quality Neutral Policy

The GLA's Air Quality Neutral Planning Support Update document published in April 2014 provides guidance on the application of the 'air quality neutral' policy. The air quality neutral policy is said to be applicable to proposed developments with ten or more residential dwellings (or an area of more than 0.5ha) and for all other uses, where the floor space is 1,000m^2 or more (or when the site area is more than 1ha).

There are a number of options available when judging whether a proposed development is air quality neutral, taking into account different types of development and how much information is know on the existing use and the proposed use. The options are presented below.

The guidance has established a building emissions benchmark (BEB) and transport emissions benchmark (TEB) for different land use classes. The proposed development needs to demonstrate compliance with these benchmarks, or where this is not possible, offsetting measures need to be used to meet the benchmarks.

Emissions from buildings and transport are to be treated separately.

Building Emission Benchmark (BEB)

Building emission benchmarks (BEB) have been set for NO_x and PM_{10}, for a series of land-use classes. To calculate the emissions from the buildings, the following information is required for each land-use category:

- Gross floor area (m^2) of development;
- On-site emissions of NO_x associated with building use (kg/annum) calculated from energy use (kWh/annum) and default or site-specific emission factors (kg/kWh); and
- On-site emissions of PM_{10} associated with oil or solid fuel use (kg/annum) calculated from energy use (kWh/annum) and default or site-specific emission factors (kg/kWh).

On-site emissions are calculated either from the estimates of fossil fuel consumption per annum, using default emission factors provided by the GLA Air Quality Neutral Planning Support 2014 document, or from knowledge of the emission standards that apply to the combustion sources (CHP/boiler). In this case, estimates were made regarding point source emissions in the model (in g/s) and therefore these emissions rates were converted to emissions rates (in kg/annum) based on estimated emissions rates. A calculation of NO_x and PM_{10} emissions (kg/annum), where applicable, for each land use class is undertaken to give total building emissions for the development.

The BEB emissions for the development are also calculated (g/m^2), using the annual emission rates as provided by the Sustainable Design and Construction SPG (2014), reproduced in Table D3 and the proposed gross internal area/ number of residential units for each type of land use. Following this, a subtraction of the BEB from the total building emissions is undertaken and, should the outcome be negative, the building emissions are therefore within the benchmark however should the outcome be positive, on or off-site mitigation is required.

Table D3: 'Air Quality Neutral' Building Emission Benchmarks

Land Use Class	NO_x (g/m^2)	PM_{10} (g/m^2)
Class A1	22.6	1.29
Class A3 – A5	75.2	4.32
Class A2 – and Class B1	30.8	1.77
Class B2 – B7	36.6	2.95
Class B8	23.6	1.90

Land Use Class	NO_x (g/m^2)	PM_{10} (g/m^2)
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
D1 (a)	43.0	2.47
D1 (b)	75.0	4.30
Class D1 (c – h)	31.0	1.78
Class D2 (a - d)	90.3	5.18
Class D2 (e)	284	16.3

Source: Sustainable Design and Construction SPG (2014).

Transport Trip Rate Benchmark (TEB)

Benchmark trip rates for those land-use classes where it was not possible to derive trip lengths are shown in Table A1.1

Table A1.1: Average Number of Trips per Annum for Different Development Categories

Landuse	Number of Trips (trips/m^2/annum)		
	CAZ	Inner	Outer
A3	153	137	170
A4	2.0	8.0	-
A5	-	32.4	590
B2	-	15.6	18.3
B8	-	5.5	6.5
C1	1.9	5.0	6.9
C2	-	3.8	19.5
D1	0.07	65.1	46.1
D2	5.0	22.5	49.0

TRAVL (Trip Rate Assessment Valid for London) is a unique, multi-modal trip generation database designed specifically for use in the capital. It is used by planners working on projects across Greater London to estimate the effect of proposed changes in land use on transport patterns and, in particular, on the amount of road traffic in an area.

From the TRAVL database it is possible to obtain average car-trip generation rates per dwelling for residential developments and trip generation rates for all vehicles, for each of the other broad land-use categories.

The average number of trips is multiplied by the total GEA for each land-use class. This can be used as a surrogate benchmark for land-used classes where trip length data is not available.

APPENDIX E
CAMDEN AIR QUALITY PLANNING CHECKLIST

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 points be included?

Y/**N**

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

The proposed development is car free therefore there will be no parking spaces.

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

Y/N

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

19 spaces in the form of nine two-tier cycle racks (18 cycles) and one wall mounted bracket – located on the basement level floor. The bike store will be used by both staff as well as customers.

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.

Y/**N**

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

4) If CHP is to be included, was this included within the air quality modelling in the AQA?

Y/N – if no, please state why.

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. Please note that the report will also Camden Planning Checklist November 2013 need to evidence that the CHP will conform to the latest (stringent) emissions limits outlined in the GLA's Draft Sustainable Design and Construction SPG.

5) If CHP will be included and the final technology agreed, have you ensured that it is the best in class in terms of NOx emissions?

Y/N

Please note that in addition to adhering to the Emission Limits outlined in the GLA Draft Sustainable Design and Construction SPG, Camden's aim is that all new CHPs will have a "Negligible" impact at all identified receptors, as defined by the EPUK Best Practice Guidance. In your AQA, please outline how you have adhered to this.

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/N

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 High, a real time monitoring proposal?

Y/N

If not, this must be provided.

Please return this form with your AQA with your Planning Application