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51 CALTHORPE STREET, LONDON, WC1X 0HH

Air Quality Assessment

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Air Quality Assessment

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Contents

Appendices

Registration of Amendments

Revision	Date	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

Brief

1.1 Create Consulting Engineers Ltd has been appointed to undertake an air quality assessment for the proposed development at 51 Calthorpe Street, London, located in the London Borough of Camden (LBC).

Project Context

1.2 The site comprises an existing three storey Victorian-era building that is currently used as offices and storage. The building's eastern side is located adjacent to the Holiday Inn Hotel and the western side abuts other residential buildings on Calthorpe Street. The front of the existing development faces south-east over Calthorpe Street and is opposite the Mount Pleasant Royal Mail sorting centre. The rear north-west elevation of the development faces the Cubitt Street play centre. The site is accessed solely via Calthorpe Street.

1.3 The red line boundary and the location of the development site is presented in Figure 1.1.

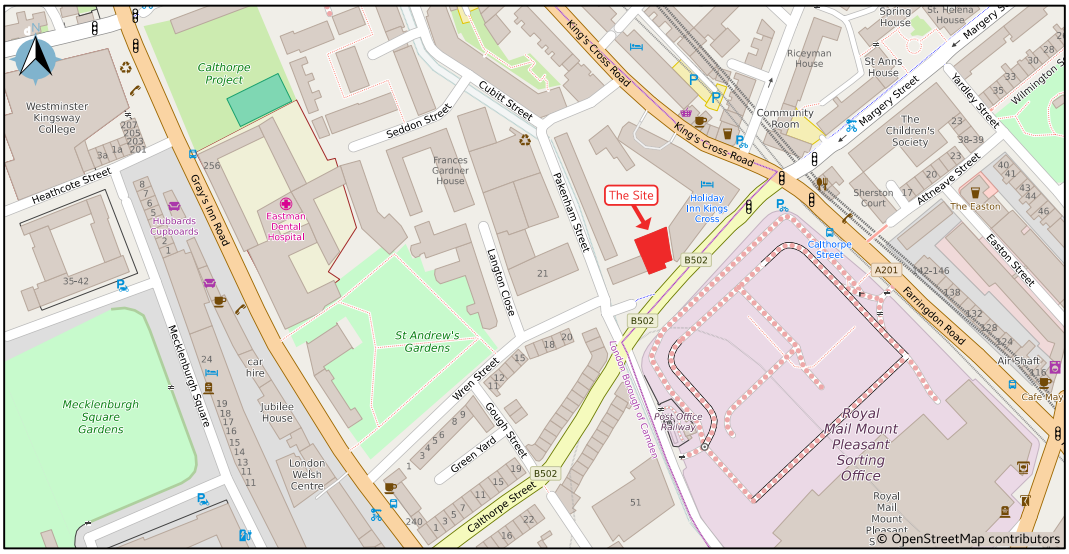

Figure 1.1: Location of the Development Site

1.4 The development proposals include the partial demolition and removal of some existing structures (including the roof) with the retention of the external walls and some floors followed by the construction of eight new flats and offices over six storeys. This includes a new basement level below the footprint of the building and the excavation of the forecourt to extend the existing lower ground floor.

Assessment Scope

1.5 This report considers the air quality impacts associated with both the construction and operation of the development. Likely changes to air quality in the area, as a result of the proposed development have been considered in relation to the national and EU Air Quality Standards to determine their significance. Also, where required, the air quality assessment considers mitigation measures to reduce the effect of the proposed development upon local air quality.

1.6 In terms of the construction impacts, the development proposal will have the potential to generate dust, particulate matter (PM_{10}), and nitrogen oxide (NOx)[1] emissions during the demolition and construction phases. These impacts are assessed in accordance with the Institute of Air Quality Management (IAQM) best practice guidance[2].

1.7 The development site is located in an Air Quality Management Area (AQMA) where concentrations of traffic-related pollutants (namely PM_{10} and nitrogen dioxide NO_2) are breaching the national objectives. Therefore, this assessment considers the exposure of future residents to ambient air quality. Where required the assessment proposes mitigation measures to reduce the impact of poor air quality on future residents.

1.8 The development proposal does not include any additional car parking spaces. It is therefore considered that traffic related air quality impacts do not require any assessment.

1.9 The proposed development includes 8 gas-fired domestic boilers (one for each of the residential unit) which will give rise to NOx emissions. This report considers the potential impacts of these emissions in the Air Quality Neutral assessment.

1.10 An 'Air Quality Neutral' assessment was undertaken where building emissions (from on-site boilers) were compared against the benchmarks detailed in the GLA Sustainable Design and Construction Supplementary Planning Guidance[3].

1 Nitrogen dioxide (NO2) and nitric oxide (NO) are both oxides of nitrogen and are collectively referred to as NOx.
[2] Holman et al (2014). *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London. www.iaqm/wpcontent/uploads/guidance/dust_assessment.pdf.
[3] Greater London Authority (2014). Sustainable Design and Construction SPG.

2.0 LEGISLATION AND POLICY CONTEXT

National Legislation

The Air Quality Strategy

2.1 European Union (EU) legislation forms the basis for UK air quality policy, the legislation has been developed in response to the identification of the relationship between air pollution and adverse effects upon human health and ecosystems. The EU Framework Directive 96/62/EC[4] on ambient air quality assessment and management came into force in November 1996 and had to be implemented by Member States by May 1998. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants.

2.2 Directive 96/62/EC and the three daughter Directives that followed were combined to form Council Directive 2008/50/EC[5] on Ambient Air Quality and Cleaner Air for Europe came into force in June 2008.

2.3 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales & Northern Ireland[6], originally adopted in 1997[7], re-issued in 2000[8] and amended in 2003[9]. It has been set out in accordance with the requirements of Part IV of the Environment Act (1995)[10]. The AQS sets standards and objectives for pollutants to protect human health, vegetation and ecosystems. The AQS sets out a framework for Local Authorities to reduce adverse health effects from air pollution and ensures that international commitments are met (the Local Air Quality Management system).

2.4 Air quality objectives and limit values that currently apply in the United Kingdom can be divided into four groups:

- United Kingdom air quality objectives set down in regulations for the purpose of Local Air Quality Management (LAQM);
- United Kingdom national air quality objectives not included in regulations;
- European Union (EU) Limit Values transcribed into United Kingdom legislation; and
- Guidelines: e.g. World Health Organization (WHO) guidelines.

[4] European Parliament (1996). Council Directive 96/62/EC on ambient air quality assessment and management.
[5] European Parliament (2008). Council Directive 2008/50/EC on ambient air quality and cleaner air for Europe.
[6] Department for Environment, Food and Rural Affairs (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Island. HMSO, London.
[7] Department of the Environment (1997). The UK National Air Quality Strategy. HMSO, London.
[8] Department of the Environment, Transport and the Regions (2000). The Air Quality Strategy for England, Scotland, Wales and Northern Island. HMSO, London.
[9] Department of the Environment, Transport and the Regions (2003). The Air Quality Strategy for England, Scotland, Wales and Northern Island: Addendum. HMSO, London.
[10] Department for Environment, Food and Rural Affairs (1995). The Environment Act 1995. HMSO, London.

2.5 The current air quality standards and objectives, of pollutants relevant to this assessment, are presented in Table 2.1. The standards and objectives relevant to the LAQM framework have been developed through the Air Quality (England) Regulations (2000)[11] and the Air Quality (England) (Amendment) Regulations 2002[12]; with the Air Quality Standards Regulations 2010[13] implementing the EU Directive 2008/50/EC.

2.6 London Borough of Camden have declared their entire area as an AQMA where NO_2 and PM_{10} objectives are exceeded in several locations.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO_2)	200 µg m^{-3}	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40 µg m^{-3}	Annual mean	31/12/2005
Particles (PM_{10})	50 µg m^{-3}	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40 µg m^{-3}	Annual mean	31/12/2004

Table 2.1: Air Quality Strategy Objectives (England)

The National Planning Policy Framework

2.7 The National Planning Policy Framework (NPPF) (March 2012)[14] Policy 11 notes that planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of AQMAs and the cumulative impacts on air quality from individual sites in local areas. It also states that planning decisions should ensure that any new development in an AQMA is consistent with the local air quality action plan.

2.8 National Planning Practice Guidance (NPPG)[15] (2014) has been developed in order to support the NPPF. Paragraph 005 of the Air Quality Guidance provides a concise outline as to how air quality should be considered in order to comply with the NPPF. Guidance states when air quality is considered relevant to a planning application, which includes when the proposals:

- *'Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations'; or*
- *'Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality'.*

[11] UK Parliament (2000). Air Quality (England) Regulations 2000, SI 2000/928. HMSO, London
[12] UK Parliament (2002) The Air Quality (England) (Amendment) Regulations 2002, SI 2002/3043. HMSO, London.
[13] UK Parliament (2010). The Air Quality Standards Regulations 2010, SI 2010/1001. HMSO, London.
[14] Department of Communities and Local Government (2012). National Planning Policy Framework. HMSO, London.
[15] Department for Communities and Local Government (2014). National Planning Policy Guidance. HMSO, http://planningguidance.planningportal.ov.uk/

2.9 The NPPG provides guidance for the completion of air quality assessments stating the importance of an assessment to be location specific, and being:

'proportionate to the nature and scale of development proposed and the level of concern about air quality.'

2.10 The mitigation measures where necessary for a development are stated to be:

'location specific, depend on the proposed development and should be proportionate to the likely impact.'

Regional Planning Policy

The London Plan (2015)

2.11 The London Plan, Further Alterations London Plan (FALP)[16] has been adopted in March 2015 and contains updated guidance for air quality and planning decisions under Policy 7.14. (Improving Air Quality) stating that:

'Development proposals should:

- *minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within 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 as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plan;*
- *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';*
- *be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs);*
- *ensure that where provision needs to be made to reduce emissions from a development, this is usually 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; and*
- *increased exposure to existing poor air quality should be minimised by avoiding introduction of potentially new sensitive receptors in locations where they will be affected by existing sources of air pollution (such as road traffic and industrial processes). Particular attention should be paid to development proposals such as housing, homes for elderly people, schools and nurseries. Where additional negative*

[16] Greater London Authority FALP (2015). The London Plan: Spatial Development Strategy for Greater London FALP. GLA, London.

air quality impacts from a new development are identified, mitigation measures will be required to ameliorate these impacts.'

The Mayor's Air Quality Strategy (2010)

2.12 Cleaning the Air: The Mayor's Air Quality Strategy[17] within Chapter 4 outlines a number of policies relating to new developments and pollutant emissions.

2.13 Policy 6, Reducing emissions from construction and demolition sites:

'The Mayor will work with London Boroughs, the GLA group and the construction industry to encourage implementation of the Best Practice Guidance for construction and demolition sites across London.'

2.14 Policy 7, Using the planning process to improve air quality:

'The Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions.'

Local Planning Policy

Camden Core Strategy 2010 – 2025 – Local Development Framework (2010)[18]

2.15 The Core Strategy was adopted in November 2010 and sets the key elements of The London Borough of Camden's vision. It is a central part of the Local Development Framework (LDF).

2.16 Within Section 3, paragraph 16.14 states the following:

"Camden suffers from poor air quality which impacts on human health, particularly the very young, older people and those with existing heart and lung conditions. The avoidance of localised air pollution is therefore very important in avoiding a potential negative impact on health and on the environment..."

2.17 Under Development Policies, Policy DP32 – Air Quality and Camden's Clear Zone, states the following:

"The Council will require air quality assessments where development could potentially cause significant harm to air quality. Mitigation measures will be expected in developments that are located in areas of poor air quality.

[17] Greater London Authority (2010). Clearing the Air: The Mayor's Air Quality Strategy. GLA, London.
[18] London Borough of Camden(LBC). (2010). Camden Core Strategy 2010-2025. LBC, London

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."

2.18 Still under Development Policies, paragraph 32.4 adds:

"The Council will take into account impact on air quality when assessing development proposals. Regard will be paid to Camden's Air Quality Action Plan and to Cleaning London's Air: The Mayor's Air Quality Strategy. 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..."

Camden's Clean Air Action Plan 2016-2018

The plan includes actions to help reduce the key air pollutants in the borough (namely NO_2 and Particulate Matters (mainly PM_{10} and $PM_{2.5}$) which arise from road traffic, gas boilers, and other sources.

The Plan includes actions related to the following subject areas:

- Monitoring air quality in Camden;
- Reducing emissions from buildings and new developments;
- Reducing emissions from transport;
- Raising awareness of air quality; and
- Lobbying and partnership working.

2.19 Following a review of the actions included in the Plan, it is concluded that proposed development will not interfere or hinder the implementation of any of the actions.

3.0 BASELINE CONDITIONS

3.1 Baseline data were gathered from the following sources:

- 2015 Air Quality Updating and Screening Assessment for London Borough of Camden;
- 2015 Air Quality Updating and Screening Assessment for London Borough of Islington; and
- DEFRA's national air quality background maps[19].

Local Air Quality Management

3.2 Under the government's Air Quality Strategy, all local authorities are required to assess air quality within their borough annually. In 2000, London Borough of Camden declared the entire Borough as an AQMA for both NO_2 and PM_{10}. The main source of these two pollutants in the borough is traffic and concentrations closely follow the road network.

Air Quality Monitoring Data

3.3 Although the site is located within the London Borough of Camden area, it is also located within close proximity to the boundary with London Borough of Islington. London Boroughs of Camden and Islington monitor NO_2 and PM_{10} using automatic air quality monitoring stations. Also, they use passive NO_2 diffusion tube at several locations. None of the automatic monitoring sites are located in the vicinity of the development. The nearest NO_2 diffusion tube sites to the proposed development are shown in Figure 3.1 and annual mean results are presented in Table 3.1.

Site Name	Site Type	Annual Mean NO_2 Concentrations µg/m^3		
		2012	2013	2014
Roseberry Avenue	Roadside	**58**	**57**	**58**
Percy Circus	Roadside	**40**	38	**40**
Wakefield Gardens	Urban Background	N/A	N/A	36

Exceedance of the NO_2 annual mean air quality objective of 40 µg/m^3 are shown in **bold**.

Table 3.1: Annual mean NO_2 Diffusion tube monitoring (data in **bold** breach the relevant national air quality objectives)

[19] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011

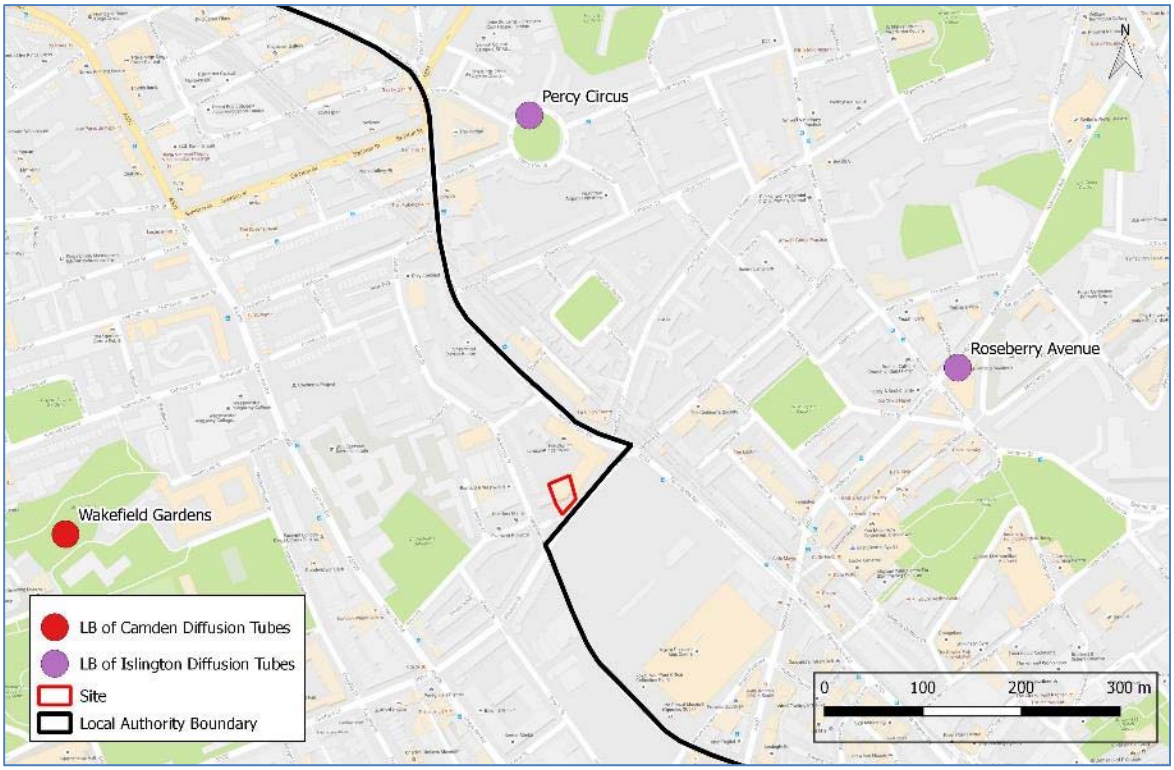

Figure 3.1: Location of NO_2 diffusion tube sites.

3.4 Annual mean results of NO_2 monitoring indicate that exceedances of the national objective of 40 µg/m^3 were recorded at the roadside locations of Roseberry Avenue and Percy Circus. However, results were within the objective at the urban background site of Wakefield Gardens.

3.5 NO_2 monitoring data from the roadside locations indicate that the proposed site is located within an area that is shown as being above the annual mean concentration objective for NO_2.

Mapped Background Pollution

3.6 The Defra website includes estimated background air pollution data for NOx, NO_2 and PM_{10} for each 1 km by 1 km OS grid square. Background pollutant concentrations are modelled from the base year of 2013 based on ambient monitoring and meteorological data from 2013 and the website includes projections for future years. Estimated pollutant concentrations for the current year (2016) in the OS grid square in which the proposed development site lies (centred at 530500, 182500) are shown in Table 3.3 below. Annual mean NO_2 background concentration exceeded the relevant objective. However, PM_{10} concentrations are within the relevant objective.

Pollutant	2016 Annual Mean (µg/m^3)
NO_x	76.7
NO_2	42.5
PM_{10}	22.1

Table 3.3: Annual Mean Background Concentrations of NO_x, NO_2 and PM_{10}

4.0 AIR QUALITY IMPACT ASSESSMENT

Construction

4.1 Potential dust impacts associated with construction activities have been assessed in accordance with guidance from the Institute of Air Quality Management (IAQM)[20] and the Greater London Authority (GLA)[21] best practice documents. The IAQM provides guidance on a five step process to assess the potential impacts of construction dust pre-mitigation, provide mitigation measures specific to the risk and assess the post-mitigation impacts.

4.2 The assessment procedure follows the following framework:

Step	Outcome
Step 1: Need for Detailed Assessment	Detailed assessment required due to proximity of sensitive receptors within 350m
Step 2: Assess the Risk of Dust Effect	High risk site due to receptors within 20m
Step 3: Identify the Need for Site-Specific Mitigation	Mitigation measures detailed in the GLA best practice guidance for High Risk will be followed
Step 4: Define Effects and their Significance	Slight adverse impacts (following mitigation)

Table 4.1: IAQM Factors for Defining the Sensitivity of an Area

4.3 During the demolition, site clearance and construction phases, there is the potential for emissions of dust to cause annoyance/nuisance for sensitive receptors, both human and ecological located close to the site.

4.4 Given the close proximity of sensitive receptors, the risk of dust annoyance occurring during construction is considered to be high; however after the implementation of appropriate mitigation measures, the significance of the impacts will only be slight.

Operation

4.5 During operation, emissions to the atmosphere can occur from both vehicles using the development and the proposed domestic gas-fired boilers. As the development proposal does not include any additional car parking spaces there will be no emissions from vehicles using the development.

4.6 The impact of NOx emissions from the domestic boilers is considered in the Air Quality Neutral assessment presented in section 5 of this report.

[20] Holman et al (2014). *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London. www.iaqm/wpcontent/uploads/guidance/dust_assessment.pdf.
[21] Greater London Authority and London Councils (2006). The Control of dust and emissions from construction and demolition: Best Guidance Practice. GLA, London.

5.0 AIR QUALITY NEUTRAL ASSESSMENT

5.1 London Plan Policy 7.14 requires development proposals within Greater London to be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs). A method for assessing this is outlined in the Sustainable Design and Construction SPG April 2014.

5.2 The Guidance sets out Building Emissions Benchmarks (BEB) and Transport Emissions Benchmarks (TEB) based upon the Gross Floor Area (GFA m^2) and on-site emissions of NOx and PM_{10}. Developments that do not exceed these benchmarks will be considered to avoid any increase in NOx and PM_{10} emissions. BEB for NOx for all land use classes are presented in Table 5.1.

Land Use Class	NOx (g/m2)
Class A1	22.6
Class A3 - A5	75.2
Class A2 and Class B1	30.8
Class B2 - B7	36.6
Class B8	23.6
Class C1	70.9
Class C2	68.5
Class C3	26.2
D1 (a)	43.0
D1 (b)	75.0
Class D1 (c -h)	31.0
Class D2 (a-d)	90.3
Class D2 (e)	284

Table 5.1: Building Emissions Benchmarks (BEBs) Emissions for Different Land Use Classes (Source: Air Quality Neutral Planning Support Update: GLA 80371, April 2014)

5.3 This assessment considers NOx building emissions from eight gas-fired domestic boilers (one for each of the residential unit).

5.4 NOx emissions factors and total maximum NOx building emissions are detailed in Table 5.2 below.

Plant	NOx emission factors (mg/kWhr)	Total maximum NOx (kg/annum)
8 X 35.3	34.9	86.3

Table 5.2: Total building emissions

5.5 The proposed development comes under land uses C3 and B1. Table 5.3 shows calculations of the total BEBs for the development.

Land use	GIA (m^2)	BEB (g/m^2/annum)	kg/annum
C3	729	26.2	19.1
B1	980	30.8	30.2
		Total	49.3

Table 4.5: Building Emission Benchmarks (BEB)

5.6 The above results indicate that NOx building emissions are higher than the BEB. However, it should be noted that these calculations are based on the boilers all operating at maximum capacity 24 hours a day all year round. If seasonal and diurnal profiles for the boilers' operation are taken into consideration, the total building emissions will be reduced to levels which are within the BEB.

6.0 EXPOSURE OF FUTURE RESIDENTS TO AMBIENT AIR QUALITY

6.1 Air quality monitoring data and national pollution background maps indicate that annual mean NO_2 objective is breached at the development site. The main source of air pollution is traffic emissions. As with a large proportion of London, the development site is situated in an area that experiences elevated air pollutant levels. The high pollutant concentrations are attributed to high background concentrations in general and to traffic emissions.

6.2 The application of mitigation measures, detailed in Section 7 will reduce the impact of ambient air quality on future occupants.

7.0 MITIGATION MEASURES

Construction Dust

7.1 A construction dust assessment has been completed for the proposed development in accordance with IAQM guidance and is presented in Appendix A. Within the assessment, site specific mitigation measures have been identified that ensure compliance with both the London Plan and the Mayor's Air Quality Strategy.

7.2 The mitigation measures have been recommended because, although the construction magnitude is considered small, the potential for dust soiling and human health effects was considered to be high.

7.3 Details of the mitigation measures suggested for the proposed development site can be seen in Appendix A.

7.4 The mitigation measures outlined below should make up part of a Construction Environment Management Plan (CEMP) that should be implemented to minimise the potential of adverse construction dust impacts throughout all the relevant construction stages.

Demolition:

- Soft strip inside buildings before demolition;
- Bag and remove any biological debris or damp down such material before demolition; and
- Ensure effective water suppression is used during demolition operations, hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;
- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust release.

Trackout:

- Ensure any vehicles entering and leaving site are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping of large areas.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid bonfires and the burning of waste materials.

7.5 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

7.6 The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will not normally be significant.

Construction Traffic and Plant

7.7 As previously stated, there is potential for air pollutant impacts to arise from construction plant and vehicles associated with the scheme. Currently the number of construction vehicles and construction plant have not been confirmed, however the following BAT (Best Available Technology) should still be implemented during the demolition and construction phases.

7.8 The construction traffic and plant mitigation measures recommended are as follows:

- All vehicles should switch off engines when stationary, no idling vehicles;
- On-road vehicles to comply with the requirements of the Low Emission Zone and the London NRMM standards, where applicable;
- All non-road mobile machinery (NRMM) to use ultra low sulphur diesel (ULSD) where available;
- Minimise the movement of construction traffic around the site;
- Maximising efficiency (this may include alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing);
- Vehicles should be well maintained and kept in a high standard of working order;
- Avoid the use of diesel or petrol powered generators by using mains electricity or battery powered equipment where possible; and
- Locate plant away from boundaries close to residential areas.

Exposure of future residents to ambient air quality

7.9 It is necessary to locate ventilation supply intakes away from Calthorpe Street. These should be located at the rear of the buildings. This will minimise ingress of air pollutants into the building and subsequent exposure of residents to air pollution.

7.10 Also, all the ventilation intakes should be fitted with NO_2 and NOx chemical scrubbing systems. Such system will provide an effective mean of reducing high NO_2 levels down to the levels within the national annual mean objective of 40ug/m^3.

7.11 Additionally, the residents and occupants of the proposed development should be made aware of the air pollution monitoring services available in London, the free services providing text messages and information relating to air quality as shown in Table 7.1 below.

Name of Service	Website	Service Provided
airText	www.airtext.info	Free text message service providing air quality alerts for Greater London.
London Air	www.londonair.org.uk	Free downloadable air quality app providing real time air quality index across London, in addition LAQM data for London Boroughs is available.

Table 7.1: London Air Quality Services

8.0 SUMMARY AND CONCLUSIONS

8.1 This assessment demonstrates that the proposed development is situated within an AQMA declared by London Borough of Camden. The AQMA covers the whole borough and it is declared on the basis that levels of NO_2 and PM_{10} would not meet the national objectives at several locations in the borough.

8.2 Air quality monitoring data and national pollution background maps indicate that the national NO_2 objective is breached at the development site. The main source of air pollution is traffic emissions. As with a large proportion of London, the development site is situated in an area that experiences elevated air pollution levels. The high pollutant concentrations are attributed to high background concentrations in general and to traffic emissions.

8.3 A construction dust assessment has been undertaken for the demolition and construction phase associated with the proposed development in accordance with IAQM and GLA guidance on the assessment of dust from demolition and construction (Appendix A).

8.4 Mitigation measures have been proposed for construction traffic and stationary plant associated with the proposed development which should be incorporated into an overall construction management plan (CMP) for the site.

8.5 It is recommended that a Dust Management Plan (DMP) is also included in the CMP and cover all stages of construction and incorporate appropriate mitigation measures. Following the successful implementation of the DMP, the residual effects of construction dust and emissions from construction activities upon local area sensitive receptors should be temporary, adverse but not significant.

8.6 To ensure suitable indoor air quality within the proposed buildings, a mechanical ventilation system should provide suitable indoor air quality conditions, reducing the need for opening windows. The location of the ventilation air inlets should be agreed with London Borough of Camden prior to construction to ensure that pollutants are not re-circulated.

8.7 It is necessary to locate ventilation supply intakes away from Calthorpe Street. These should be located at the rear of the building. This will minimise ingress of air pollutants into the building and subsequent exposure of residents to air pollution. Also, ventilation intakes should be fitted with NO_2 and chemical scrubbing systems in order to reduce pollution down to levels within the national objectives.

8.8 The development proposal does not include any additional car parking spaces. Therefore, traffic related air quality impacts are assessed to be negligible.

8.9 Results of the Air Quality Neutral assessment indicate that NOx building emissions are higher than the relevant GLA benchmarks (based on the maximum capacity of the gas-fired boilers). However, if seasonal and diurnal profiles for the boilers operation are taken into consideration, the total building emissions are expected to be reduced to levels which are within the benchmarks.

9.0 DISCLAIMER

9.1 Create Consulting disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report.

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APPENDICES

APPENDIX A

Construction Dust Assessment

CONSTRUCTION DUST ASSESSMENT

A.1 The construction dust assessment has been completed in accordance with 2014 IAQM guidance and follows the procedure as outlined in Section 4 of this report.

Screen the Need for a Detailed Assessment

A.2 The following screening criterion has been applied to the assessment: An assessment will normally be required where there is:

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

A.3 There are a number of human receptors within 350 m of the site boundary but no ecological receptors within 50 m of the site. However, a dust assessment is still required due to the proposed development location meeting some of the above criteria.

Assess the Risk of Dust Impacts

A.4 The assessment of the risk of dust impacts was completed in two stages:

- Determine the potential dust emission magnitude; and
- Determine the sensitivity of the area to dust impacts.

A.5 The potential dust emission magnitude for all four of the construction activities were determined to be Small, Medium or Large according to the criteria presented in Table A.1.

Construction Activity	Dust Emission Magnitude Scale		
	Small	Medium	Large
Demolition	Total building volume <20,000m^3, construction material with low potential for dust release, demolition activities <10m above ground, works during wetter months.	Total building volume 20,000-50,000m^3, potentially dusty construction material, demolition activities 10-20m above ground level.	Total building volume >50,000m^3, potentially dusty material, on-site crushing and screening, activities >20m above ground level.
Earthworks	Total site area <2,500m^2, soil type with large grain	Total site area 2,500-10,000m^2, moderately	Total site area >10,000m^2, potentially

Construction Activity	Dust Emission Magnitude Scale		
	Small	Medium	Large
	size, <5 heavy earth moving vehicles active at one time, bunds <4m high, total material moved <20,000t, works during wetter months.	dusty soil type, 5-10 heavy earth moving vehicles active at one time, bunds 4-8m high, total material moved 20,000-100,000t.	dusty soil type, >10 heavy earth moving vehicles active at one time, bunds >8m high, total material moved >100,000t.
Construction	Total building volume <25,000m^3, construction material with low potential for dust release.	Total building volume 25,000-100,000m^3, potentially dusty construction material, on site concrete batching.	Total building volume >100,000m^3, on site concrete batching, sandblasting.
Trackout	<10 HDV* outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50m.	10-50 HDV outward movements in any one day, moderately dusty surface material, unpaved road length 50-100m.	>50 HDV outward movements in any one day, potentially dusty surface material, unpaved road length >100m.
* HDV – Heavy Duty Vehicle (>3.5t), Note – In each case, not all the criteria need to be met, and that other criteria may be used if justified.			

Table A.1: Dust Emission Magnitude Criteria

A.6 The completed assessment of Dust Emission Magnitude is shown in Table A.2 below.

Construction Activity	Dust Emission Magnitude	Justification
Demolition	Medium	Existing building has been estimated to have a total volume of 27,000m^3
Earthworks	Medium	Total site area has been estimated to be 2,700m^2 and 5 to 10 earth moving vehicles will be required on site.
Construction	Medium	Total building volume has been estimated to be between 25,000-100,000m^3, potentially dusty construction material.
Trackout	Medium	Estimated to be between 10-50 heavy vehicles per day.

Table A.2: Dust Emission Magnitude Assessment

A.7 The sensitivity of the area has been assessed in relation to a number of factors such as: the specific sensitivities of receptors in the area; the proximity and number of those receptors and in the case of PM_{10}; the local background concentration; and also following the significance criteria in Tables A.3, A.4 and A.5 below.

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

Table A.3: Sensitivity of the Area to Dust Soiling Effects of People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32 µg m^{-3}	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg m^{-3}	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg m^{-3}	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg m^{-3}	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A.4: Sensitivity of the Area to Human Health Impacts

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

Table A.5: Sensitivity of the Area to Ecological Impacts

A.8 In addition to Tables A.3, A.4 and A.5 any site specific factors have been taken into account when defining the sensitivity of the area:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors; and
- the duration of the potential impact, as a receptor may become more sensitive over time.

A.9 The completed pre-mitigation impact risk assessment incorporating the sensitivity of the area and the dust emissions magnitude for the four construction activities is shown below.

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	High	High	High	High
Ecological	N/A	N/A	N/A	N/A

Table A.6: Summary of Dust Risk (pre-mitigation)

Site-specific Mitigation

A.10 From the identification of the risk of impacts with no mitigation applied in Table A.6, it is possible to determine the specific mitigation measures that can be applied in relation to the level of risk associated with the construction activity. The mitigation measures described below are suggested as measures that should be included in a site specific Construction Environmental Management Plan (CEMP).

Demolition:

- Soft strip inside buildings before demolition
- Bag and remove any biological debris or damp down such material before demolition; and
- Ensure effective water suppression is used during demolition operations, hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is required.

Earthworks:

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Avoid carrying out any earthworks during dry weather if reasonably practicable having regard to programme and contracting arrangements for the relevant works or provide and ensure appropriate use of water to control dust; and
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

Construction:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless required for a particular process;
- Mix large quantities of cement, grouts and other similar materials in enclosed areas remote from site boundaries and potential receptors;

- 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; and
- For small supplies of fine powder ensure bags are sealed after use and are stored appropriately to prevent dust.

Trackout:

- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Ensure any vehicles entering and leaving sites are securely covered to prevent escape of materials during transport;
- Routinely clean public roads and access routes using wet sweeping methods; and
- Avoid dry sweeping of large areas.

General Mitigation Measures:

- Ensure regular cleaning of hardstanding surfaces using wet sweeping methods;
- Display the head or regional office contact information, and the name and contact details of person(s) accountable for air quality on the site boundary;
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Log all air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record all measures taken. Make the complaints log available to the Local Authority when asked;
- Carry out regular on-site and off-site inspections to monitor dust soiling effects, with cleaning to be provided if necessary. Increase the frequency of inspections when activities with a high potential to produce dust are being carried out;
- Erect barriers around the site, any dusty activities and stockpiles (to be covered);
- Screen areas of the building, where dust producing activities are taking place, with debris screens or sheeting;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Remove materials that have a potential to produce dust as soon as possible, unless being re-used. If they are to be re-used, on site covers should be used;
- Ensure all vehicles switch off engines when stationary, no idling vehicles;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine sprays on such equipment wherever possible; and
- Avoid bonfires and the burning of waste materials.

A.11 It is important that attention is paid to any construction activity that takes place in close proximity to the site boundary, potentially at the closest location to sensitive receptors.

A.12 The implementation of the specific mitigation measures given above within a CEMP will ensure that the potential adverse impacts from construction dust during all construction stages are avoided. It is noted by the IAQM that through the use of effective mitigation, the effects of dust from construction activity will normally be not significant.

Determine Significant Effects

A.13 Prior to the implementation of any mitigation measures the highest significance of adverse effects was 'High Risk' for all activities associated with the development. The mitigation measures listed have been chosen due to their suitability to the site and to reduce the risk of adverse effects from the four stages of construction.

A.14 The implementation of the site specific mitigation measures is designed to mitigate potential dust impact. These measures will ensure that potential significant adverse dust effects will not occur and the residual effect will normally be 'not significant'.

Conclusions of Construction Dust Assessment

A.15 The completion of the construction dust assessment has shown that the residual effect of the proposed development in the context of construction dust emissions will be 'not significant'. This conclusion has been made based on the assumption that the suggested mitigation measures will be implemented and is relevant for all sensitive receptors within 350 m of the site.

A.16 It is important to note that even with a rigorous CEMP in place, it is not possible to guarantee that all mitigation measures will be effective at all times. If there is an interruption in the water supply used for dust suppression or adverse weather conditions are experienced that exacerbate dust emissions, the receptors may experience occasional, short term dust annoyance.

A.17 However, the likely scale of this would not normally be considered sufficient to change the conclusion that with mitigation the effects will be 'not significant'. It is therefore important to consider all mitigation measures and provide a frequent review and assessment procedure for each when in place to ensure that they continue to provide a full level of mitigation.