Seaforth Land Holdings Limited

20-23 Greville Street, London

Air Quality Assessment

MLM. Group

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1 Limitations and Exceptions

This report and its findings should be considered in relation to the terms and conditions proposed and scope of works agreed between MLM and the client.

The Conclusions and Recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon until considered in the context of the whole report.

This report provides available factual data for the site and the surrounding area at the time of the study and as obtained by the means described in the text. The data is related to the site on the basis of the site location information provided by the Client.

It should be appreciated that the information that has been made available to date, is not necessarily exhaustive and that further information relevant to the proposed site usage may be provided which could change the overall findings.

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2 Introduction

2.1 General

MLM Consulting Engineers Ltd (MLM) was commissioned by Seaforth Land Holdings Limited (the Client) to undertake an air quality assessment to assist with the planning application of the proposed refurbishment at 20-23 Greville Street London EC1N 8SS ('Site').

The Site falls within the planning jurisdiction of London Borough of Camden (LBC).

2.2 Report Structure

The structure of the report is summarised below:

- A brief description of the site and proposed development
- A brief description of the legislation governing air quality in England
- Details of the methodology used for the assessment
- Results of the Air Quality Assessment
- Conclusions

2.3 Objectives

The objectives of this report are:

- To review of air quality around the development site using existing air quality monitoring and/or modelling data;
- To impact on air quality during the construction phase and detailed mitigation methods for controlling dust and pollution emissions associated with plant and vehicles;
- To assess the likely air quality at the proposed development site in terms of nitrogen dioxide (NO_2) and the Particulate Matter (PM_{10}, ie particles which are less than 10µm in diameter) concentrations to indicate the number of receptors which could be exposed to poor air quality as a result of the development; and
- Recommendation of appropriate mitigation measures, if required in addition to those included at the design stage.

As agreed with the Senior Planning Officer at LBC during the consultation exercise, a 'simple' assessment has been undertaken using qualitative methods rather than using detailed dispersion modelling.

3 The Site

3.1 Location and Description

The proposed development site is located to the south of Greville Street, and comprises an existing 1970s office building, including at basement, ground, first, second, third, fourth and roof levels.

The site falls within the planning jurisdiction of London Borough of Camden (LBC), and the approximate coordinates of the site are 531468 (Easting), 181762 (Northing).

An initial review of LBC's Local Air Quality Management activities indicates that the whole borough has been declared as an Air Quality Management Area (AQMA) for exceedances of the annual mean NO_2 objective and also annual mean and 24-hour mean PM_{10} objectives. The site is, therefore, within the AQMA.

The location of the Site is shown below in Figure 1.

3.2 The Proposed Development

The planning application is for:

> *"Change of use of existing office (Class B1a) use at basement, ground floor and 1st floor to retail/restaurant (Class A1/A3) use; demolition of existing 5th floor plant room and erection of new 2 storey roof extension for office use; erection of 5 storey rear extension; infill of rear lightwell to create cycle storage and changing facilities at basement level; external alterations including new facade and glazing, and associated works."*

An indicative layout of the proposed development is provided in Figure 2.

4 Air Quality Standards

4.1 International Legislation and Policy

The European Directive (2008/50/EC) sets legally binding limits for concentrations of outdoor air of major air pollutants that impact public health such as particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2). The European Directive is implemented in the UK under the Air Quality Standards Regulations 2010. The obligations under the Air Quality Standards Regulations 2010 are separate from those of the 2000 and 2002 UK Regulations because local authorities in the UK will only have powers to manage some of the pollutants in the Air Quality Standards Regulations 2010 as most of the source pollutants will be managed by the Environment Agency under the IPPC Regime. Therefore, the obligation to meet the Air Quality Standards Regulations 2010 rests with the Secretary of State for Environment.

4.2 National Legislation and Policy

4.2.1 Local Air Quality Management

Part IV of the Environment Act 1995, requires the UK Government to publish an Air Quality Strategy and local authorities to review, assess and manage air quality within their areas. This is known as Local Air Quality Management (LAQM). The 2007 Air Quality Strategy establishes the policy for ambient air quality in the UK. It includes the National Air Quality Objectives (NAQOs) for the protection of human health and vegetation for 11 pollutants. Those NAQOs included as part of LAQM are prescribed in the Air Quality (England) Regulations 2000 and the Air Quality (Amendment) (England) Regulations 2002. Table 4.1 presents the NAQOs for Nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of 10 µg or less (PM_{10}), the key pollutants of concern in relation to vehicle emissions.

Table 4.1 Relevant Objectives set out in the Air Quality Strategy

Pollutant	Concentrations	Measured As
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times per year	One hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times per year	24 hour mean
	40 µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	25 µg/m^3	Annual Mean

The Air Quality Strategy also introduced a new policy framework for tackling fine particles ($PM_{2.5}$) including an exposure reduction target. However, although EU Directive 2008/50/EC includes a new regulatory framework for $PM_{2.5}$ this pollutant is not included within LAQM, therefore, there is no requirement to assess this pollutant unless as part of an Environmental Impact Assessment (EIA).

However, to ensure a robust assessment $PM_{2.5}$ has been considered in this assessment. The objective for this pollutant has been included in Table 4.1.

The NAQOs apply to external air where there is relevant exposure to the public over the associated averaging periods within each objective. Guidance is provided within Local Air Quality Management Technical Guidance 2009 (LAQM.TG (16)) issued by DEFRA for Local Authorities, on where the NAQOs apply as detailed in Table 4.2. The objectives do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (ie centre of roadways).

Table 4.2 Locations Where Air Quality objectives Apply

Averaging period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed.	Building façades of offices or other places of work where members of the public do not have regular access. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean objective would apply. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 hour mean objectives apply. Kerbside Sites (eg pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one-hour or more. Any outdoor locations where the public might reasonably be expected to spend one-hour or longer.	Kerbside sites where the public would not be expected to have regular access.

4.2.2 National Planning Policy Framework

Published on 27 March 2012, the National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. It replaces Planning Policy Statement 23: Planning and Pollution Control which provided planning guidance for local authorities with regards to air quality. At the heart of the NPPF is a presumption in favour of sustainable development.

It requires Local Plans to be consistent with the principles and policies set out in the Framework with the objective of contributing to the achievement of sustainable development.

Current planning law requires that application for planning permissions must be determined in accordance with the relevant development plan (ie Local Plan or Neighbourhood Plan). The NPPF should be taken into account in the preparation of development plans and therefore the policies set out within the Framework are a material consideration in planning decisions.

The NPPF identifies 12 core planning principles that should underpin both plan-making and decision-taking, including a requirement for planning to *'contribute to conserving and enhancing the natural environment and reducing pollution'*.

Under Policy 11: Conserving and Enhancing the Natural Environment the Framework requires the planning system to *'prevent both new and existing developments from contributing to or being put at unacceptable risk or being adversely affected by unacceptable levels of air pollution'*.

In dealing specifically with air quality the Framework 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 an AQMA and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in AQMAs is consistent with the local air quality action plan'*

4.2.3 Control of Dust and Particulates Associated with Construction

Section 79 of the Environmental Protection Act (1990) states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Statutory nuisance is defined as:

> *'Any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'*
>
> *'Any accumulation or deposition which is prejudicial to health or a nuisance'*

Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

In the context of the proposed development, the main potential for nuisance of this nature will arise during the construction phase - potential sources being demolition, clearance, earthworks, construction and landscaping processes.

There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist - 'nuisance' is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred. However, research has been undertaken by a number of parties to determine community responses to such impacts and correlate these to dust deposition rates. However, impacts remain subjective and statutory limits have yet to be derived.

4.2.4 Local Planning Policy

LBC's Draft Local Plan includes an air quality chapter. Within this, Policy CC4 states that:

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

Until the new Local Plan is adopted the Council's Local Development Framework from 2010 remains the relevant set of planning policy documents. A number of policies relating to improving air quality are contained within LBC's Core Strategy. In particular policy CS16 (Improving Camden's health and wellbeing) recognises the impact of poor air quality on public health, which states that:

"The Council will seek to improve health and well-being in Camden. We will… recognise the impact of poor air quality on health and implement Camden's Air Quality Action Plan which aims to reduce air pollution levels".

The Core Strategy is supported by the Camden Development Policies document. Policy DP32 sets out how LBC Council will expect developments to reduce their impact on air quality:

"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".

LBC has also prepared a Supplementary Planning Document - Camden Planning Guidance (CPG) 6 Amenity, which provides further guidance on air quality. It includes information on when an air quality assessment will be required, what an air quality assessment should cover and what measures can reduce air quality emissions and protect public exposure. LBC's overarching aim is for new development to be 'air quality neutral' and not lead to further deterioration of existing poor air quality. Mitigation and offsetting measures to deal with any negative air quality impacts associated with the development proposals may be required. The development should be designed to minimise exposure of occupants to existing poor air quality. It states that the Council requires assessments for development that could have a significant negative impact in air quality. This impact can arise during both the construction and operational stages of a development as a result of increased NO_x and PM_{10} emissions.

4.2.5 Air Quality Action Plan

LBC has declared an AQMA for NO_2 and PM_{10} that covers the whole Borough, and has developed an Air Quality Action Plan. Camden's Clean Air Action Plan outlines the Councils commitment to improving air quality in the Borough.

The key objectives of the plan are to reduce PM_{10} and NO_2 concentrations by:

- Encouraging reductions in fossil fuel use, the adoption of clean fuels and low emission technology and promote energy efficiency;
- Raising awareness about air quality in Camden and promote lifestyle changes which can help reduce levels of air pollution and minimise exposure to air pollution;
- Improving the health and well-being of the local population, including those that work and visit Camden;
- Working in partnership with national and regional bodies, and with local public and private organisations, to foster and drive improvements in air quality;
- Leading by example and reduce NO_2 and PM_{10} emissions associated with the Council's own buildings and transport services;
- Ensuring actions which serve to reduce NO_2 and PM_{10} emissions complement actions to mitigate CO_2 emissions.

5 Local Baseline Air Quality

5.1 Local Air Quality Management

Air quality monitoring has identified ongoing exceedances of the air quality objectives and Council's AQMA, which covers the whole of the Borough.

5.1.1 Automatic Monitoring

LBC operates four automatic monitoring sites (LB, CD1, CD3 and CD9) that measure NO_2, PM_{10} and $PM_{2.5}$, CO, SO_2 and O_3. The Site location in relation to the nearest automatic monitoring sites is shown in Figure 3.
The measured concentrations of NO_2 and PM_{10} from 2014 to 2016 is shown in Table 5.1 to 5.2 below.

Table 5.1 Monitored NO_2 Concentrations at Automatic Monitoring sites

Site ID	Site Name	Site Type	Distance from the Site (in kms)	NO_2 Annual Mean Concentration (in µg/m^3)		
				2014	2015	2016
LB	London Bloomsbury	Urban Background	1.4	**45**	**48**	**42**
CD3	Shaftesbury Avenue	Roadside	1.5	**69**	**83**	**84**
CD9	Euston Road	Roadside	1.8	**98**	**90**	**88**
CD1	Swiss Cottage	Kerbside	5.5	**66**	**61**	**66**

Note: Exceedance of the NO_2 annual mean NAQO of 40 µg/m^3 are shown in bold.
NO_2 annual mean in excess of 60 µg/m^3, indicating a potential exceedance of the hourly mean AQS objective are shown in bold and underlined.

Table 5.2 Monitored PM_{10} Concentrations at Automatic Monitoring sites

Site ID	Site Name	Site Type	Distance from the Site (in kms)	PM_{10} Annual Mean Concentration (in µg/m^3)		
				2014	2015	2016
LB	London Bloomsbury	Urban Background	1.4	20	22	20
CD3	Shaftesbury Avenue	Roadside	1.5	25	22	18

Site ID	Site Name	Site Type	Distance from the Site (in kms)	PM_{10} Annual Mean Concentration (in µg/m^3)		
				2014	2015	2016
CD9	Euston Road	Roadside	1.8	29	18	24
CD1	Swiss Cottage	Kerbside	5.5	22	20	21

Based on the information in above tables, the distance of the sites CD3, CD9 and CD1 is more than 1.5kms from the proposed development site and therefore, are unlikely to represent the air quality at the proposed development site. The closest monitoring location LB is approximately 1.4kms from the proposed development site and being an urban background site, is likely to represent the air quality at the proposed development site.

5.1.2 Non Automatic Monitoring

During 2016, the LBC's diffusion tube network comprised of NO_2 diffusion tubes at 14 locations. Table.5.3 below shows NO_2 monitoring data from the non-automatic sites from 2014 to 2016 that were within 2kms of the proposed development. The Site location in relation to the nearest diffusion tube locations is shown in Figure 3.

Table 5.3 Monitored NO_2 Concentrations at Non-Automatic sites from 2014 to 2016

Site ID	Site Name	Site Type	Distance from the Site (in kms)	Annual Mean NO_2 concentration (µg/m^3)		
				2014	2015	2016
CA6	Wakefield Gardens	Urban Background	1.23	36.4	35.8	31.3
CA21	Bloomsbury Street	Roadside	1.51	**80.8**	**71.4**	**72.2**
CA10	Tavistock Gardens	Urban Background	1.69	**46.5**	**44.6**	39.7
CA4	Euston Road	Roadside	1.71	**89.7**	**86.8**	**82.7**
CA11	Tottenham Court Road	Kerbside	1.90	**86.8**	**85.6**	**83.6**

Notes: Exceedance of the NO_2 annual mean NAQO of 40 µg/m^3 are shown in bold.
NO_2 annual mean in excess of 60 µg/m^3, indicating a potential exceedance of the hourly mean AQS objective are shown in bold and underlined.

5.2 Data from London Air Website

A snapshot of the annual mean pollution map of NO_2 obtained from the London Air website is shown in Figure 4. The figure indicates that the NO_2 concentrations in the vicinity of Greville Street are in the range 40 – 43 µg/m^3, which are above the NAQOs. The figure also indicates that the PM_{10} concentrations are in the range 25 – 34 µg/m^3, which is below the NAQOs.

5.3 Defra Background Maps

Additional information on estimated background pollutant concentrations has been obtained from the DEFRA background maps provided on UK-AIR, the Air Quality Information Resource (http://uk-air.defra.gov.uk). Estimated air pollution concentrations for oxides of nitrogen (NO_x), NO_2, PM_{10} and $PM_{2.5}$ have been extracted from the 2015 background pollution maps for the UK and are set out in Table.5.4 below. These maps are available in 1km x 1km grid squares and provide an estimate of concentrations between 2015 and 2030. Background concentrations have been taken from the grid squares 530500, 181500; which includes the Site.

Table 5.4 Annual Mean Background Concentrations from Defra based on Background Maps.

Pollutant	Background Concentrations (µg/m^3)		
	2018	2019	2020
NO_2	44.9	41.6	37.6
PM_{10}	20.7	20.4	20.0
$PM_{2.5}$	13.1	12.8	12.5

Based on the information in the Table.5.4 above, there is a clear decreasing trend in the background concentrations of all pollutants from 2018 through to 2020.

6 Construction Phase Impacts

6.1 Methodology

It is inevitable that with any development, demolition and construction activities would cause some disturbance to those nearby. Dust arising from most construction activities tends to be of a coarse nature, which through dispersion by the wind, can lead to soiling of property including windows, cars, external paintwork and laundry.

The ability of dust particles to remain suspended in the air depends on its shape, size and density. Coarse particles (>30µm) tend to be deposited within 100m of source. Finer particles, between 10-30µm, are generally deposited within 200 to 500 m of source, while very fine particles (<10 µm), which remain suspended for longer, can travel up to 1km from source. The greatest proportion of construction dust is made up of coarse particles, thus the majority of dust emissions are deposited within 100m of source.

However, as well as giving rise to annoyance due to soiling of surfaces from dust emissions, there is evidence of major construction activities causing increases in long term PM_{10} concentrations and in the number of days exceeding the short term PM_{10} objective of 50 µg/m^3. The potential for impacts to occur during the construction of a proposed development must therefore be considered, to ensure appropriate mitigation measures are applied to reduce potential impacts at adjacent receptors. However, it should be noted that disruption due to demolition and construction is a localised phenomenon and is temporary in nature.

During the construction of the proposed development, lorries would require access to the site to deliver and remove materials; earthmoving plant and other mobile machinery will work on site and generators and cranes will also be in operation. These machines produce exhaust emissions; of particular concern are emissions of NO_2 and PM_{10}.

The assessment of construction impacts has followed the methodology set out within guidance produced by the Institute of Air Quality Management (IAQM) on assessing impacts from construction activities and is set out below.

6.1.1 Prediction Method and Approach

In order to assess the potential impacts, the activities on construction sites are divided into four categories. These are:

- Demolition (removal of existing structures);
- Earthworks (soil-stripping, ground-levelling, excavation and landscaping);
- Construction (activities involved in the provision of a new structure); and
- Trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

For each activity, the risk of dust annoyance, health and ecological impact is determined using three risk categories: low, medium and high risk. The risk category may be different for each of the four activities. The risk magnitude identified for each of the construction activities is then compared to the number of sensitive receptors in the near vicinity of the site in order to determine the risks posed by the construction activities to these receptors.

Step 1: Screen the Need for an Assessment

The first step is to screen the requirement for a more detailed assessment. An assessment is required where there is:

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

Step 2A: Define the Potential Dust Emission Magnitude

This is based on the scale of the anticipated works and the proximity of nearby receptors. The risk is classified as small, medium or large for each of the four categories.

Demolition: The potential dust emission classes for demolition are:

- Large: Total building volume >50,000m^3, potentially dusty construction material (eg Concrete), 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 10-20m above ground level; and
- Small: total building volume <20,000m^3, construction material with low potential for dust release (eg metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks: This involves excavating material, haulage, tipping and stockpiling. The potential dust emission classes for earthworks are:

- Large: Total site area >10,000m^2, potentially dusty soil type (eg clay, which would be prone to suspension when dry due to small particle size), >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 2,500m^2 - 10,000m^2, moderately dusty soil (eg silt), five - ten heavy earth moving vehicles active at any one time, formation of bunds 4m - 8m in height, total material moved 20,000 tonnes- 100,000 tonnes; and
- Small: Total site area <2,500m^2, soil type with large grain size (eg sand), <five heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <20,000 tonnes, earthworks during wetter months.

Construction: The important issues here when determining the potential dust emission magnitude include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The categories are:

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

Trackout: The risk of impacts occurring during trackout is predominantly dependent on the number of vehicles accessing the Site on a daily basis. However, vehicle size and speed, the duration of activities and local geology are also factors which are used to determine the emission class of the Site as a result of the trackout. The categories are:

- Large: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (eg high clay content), unpaved road length > 100m;
- Medium: 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (eg high clay content, unpaved road length 50-100m; and

- Small: <10 HDV (>3.5t) outward movements 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 (PM_{10}) and ecological receptors. The sensitivity of the area takes into account the following factors:

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

Table 6.1 is used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table 6.1 Examples of Factors Defining Sensitivity of an Area

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	Users can reasonably expect 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. eg dwellings, museums and other important collections, medium and long-term car parks and car showrooms.	10 – 100 dwellings within 20m of site. Local PM_{10} concentrations close to the objective (eg annual mean 36 -40 $\mu g/m^3$), eg residential properties, hospitals, schools and residential care homes.	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red List for Great Britain. eg A Special Area of Conservation (SAC).
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	Less than 10 receptors within 20 m. Local PM_{10} concentrations below the objective (eg. annual mean 30-36 $\mu g/m^3$). eg office and shop workers but would generally not include workers occupationally exposed to PM_{10} as protection is covered by	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 eg A Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	periods as part of the normal pattern of use of the land. eg parks and places of work.	the Health and Safety at Work legislation	
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. eg playing fields, farmland unless commercially sensitive horticultural, footpaths, short lived car parks and roads.	Locations where human exposure is transient. No receptors within 20m. Local PM_{10} concentrations well below the objectives (less than 75%). eg public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. eg Local Nature Reserve with dust sensitive features.

Based on the sensitivities assigned to the different receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification can be defined for each. Tables 6.2 to 6.4 indicate the criteria used to determine the sensitivity of the area to dust soiling, human health and ecological impacts.

Table 6.2 Sensitivity of the Area to Dust Soiling on People and Property

Receptor Sensitivity	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 6.3 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low		≥1	Low	Low	Low	Low	Low

Table 6.4 Sensitivity of the Area to Ecological Impacts

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

Step 2C: Define the Risk of Impacts

The final step is to combine the dust emission magnitude determined in step 2A with the sensitivity of the area determined in step 2B to determine the risk of impacts with no mitigation applied. Tables 6.5 to 6.7 indicate the method used to assign the level of risk for each construction activity.

The identified risk of impact is then used to identify appropriate mitigation measures for inclusion with a Dust Management Plan (DMP) which is usually incorporated within the Site's Construction Environmental Management Plan (CEMP).

Table 6.5 Risk of Dust Impacts from Demolition

Sensitivity of Area	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 6.6 Risk of Dust Impacts from Earthworks/Construction

Sensitivity of Area	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 6.7 Risk of Dust Impacts from Trackout

Sensitivity of Area	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

6.1.2 Significance Criteria of Construction Phase Impacts

As detailed in the assessment methodology, each activity during construction is assessed and the dust emission magnitude defined. The sensitivity of the surrounding area to potential impacts is then considered. The risk of dust effects is then identified based on the dust magnitude and sensitivity of surrounding area. This is then used to identify appropriate mitigation.

6.2 Dust Impacts during the Construction Phase of the Proposed Development

The proposed development site is currently a five-storey building, of 1970 origins and as mentioned in Section 3 of this report the Site is located on the southern side of Greville Street.

Dust emissions from demolition and construction activities can result in significant impacts on ecologically sensitive receptors within 50m of a construction site.

A review of data held on the Defra's MAGIC website shows there are no sites designated as important within 50m of the Site. Therefore, the impacts at ecological receptors have not been considered further within this assessment.

The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

The Non-Road Mobile Machinery (NRMM) used as part of the proposed development is expected to be minimal and would comply with the requirements set out in London Mayor's Supplementary Planning Guidance 'The Control of Dust and Emissions from Construction and Demolition'.

A wind rose from London City Airport meteorological station for the year 2012 to 2016 is shown in Figure 5. We consider this station as a representative of the development site. The prevailing wind direction during five years was south-westerly. Areas most consistently affected by pollutants are influenced by prevailing winds that are generally located downwind of an emission source, and therefore these are likely to be to the north-east of Greville Street and parts of Farringdon Road.

6.2.1 Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of anticipated works at the site and has been classified as small, medium or large for each of the four activities; demolition, earthworks, construction and trackout.

Based on the information available on construction activities, we have qualitatively assessed the magnitude of dust emissions during of each activity and summarised in Table 6.8.

Demolition

Demolition is defined as any activity which involves the removal of an existing structure (or structures). This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time.

The site is currently a five-storey building land, and the extent of demolition is <20,000 m^3. However, as the proposals include demolition of the existing roof level structures, the height of the demolition is more than 20m. The dust emission magnitude is therefore considered to be 'Medium' for conservative assessment.

Earthworks

Earthworks are those activities involved in preparing the site for construction such as excavation of material, haulage, tipping, stockpiling and levelling.

No earthworks are proposed. Therefore, it is considered that the potential dust emission magnitude for earthwork activities would be 'Small'.

Construction

There are a number of factors that can have an impact on the magnitude of dust emission during construction activities, which include the size of the building, materials used for construction, the method of construction and the duration of the build.

It is not clear if there will be any sand blasting or concrete batching involved during the construction stage. Given the size of the proposed development to be 1057m^3, the dust emission magnitude from construction would be 'Small'.

Trackout

The risk of impacts occurring during trackout is predominantly dependent on the number of vehicles accessing the site on a daily basis. However, vehicle size and speed, the duration of activities and local geology are also factors which are used to determine the emission class of the site as a result of trackout.

Based on the size of the site, it is anticipated that construction phase activities will result <10 heavy duty vehicles (HDV) per day on the adjacent road network and the length of the unpaved road to be less than 50m. The resulting magnitude of emissions from trackout activities are therefore considered to be 'Small'.

Table 6.8 Summary of Dust Emission Magnitude for Each Activity

Source	Magnitude
Demolition	Medium
Earthworks	Small
Construction	Small
Trackout	Small

6.2.2 Sensitivity of the Surrounding Area

The sensitivity of the surrounding 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 concentrations
- Site-specific factors ie whether there are natural shelters such as trees, to reduce the risk of wind-blown dust

Based on the IAQM guidance residential dwellings and school are considered as 'High' sensitivity receptors in relation to both dust soiling and health effects of PM_{10}.

As seen in Figure 6, the area surrounding the proposed development site are non-residential in nature. However, for conservative assessment it is assumed that there are over 10 high sensitive receptors (assumed to be apartments above some buildings with commercial use on the ground floor) within the 20m buffer zone. As a result, given the distance and number of these receptors, the sensitivity of the surrounding area is considered to be 'High' in relation to dust soiling effects on people and property from the construction activities.

Table 6.9 Sensitivity of Receptors

Potential Impact		Sensitivity at Site
Dust Soiling	Receptor sensitivity	High
	Number of receptors	10 -100 within 20m
	Sensitivity of the area	**High**
Human Health	Receptor sensitivity	High
	Annual mean PM_{10} concentration	<24 µg/m^3
	Number of receptors	10-100 within 20m

Potential Impact		Sensitivity at Site
	Sensitivity of the area	**Low**

Trackout may occur from the side of the roads used by the construction traffic and up to 50m from the site access point from a small site. Based on the road layout it is understood that the construction traffic will have access to Farringdon Road from Greville Street. It is assumed that are 10-100 high sensitive receptors (ie residential dwellings) on these roads which could be less than 20m from the HDV's during the trackout. The resulting sensitivity of the surrounding area is therefore considered to be 'High' in relation to dust soiling effects on people and property from trackout.

Table 6.10 Summary of Sensitivity of Surrounding Area

Potential Impact	Sensitivity of Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low

6.2.3 Defining the Risk of Impacts

The dust emission magnitude as set out in Table 6.8 is combined with the sensitivity of the area (Table 6.10) to determine the risk of both dust soiling and human health impacts, assuming no mitigation measures applied at site.

The risk of impacts associated with each activity are provided in Table 6.11 below and have been used to identify site-specific mitigation measures, which are set out in Appendix A.

Table.6.11 Summary of Risk Effects to Define Site Specific Mitigation

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

7 Operational Phase Impacts

7.1 Methodology

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) jointly published a guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' (and updated in January 2017) to ensure that air quality is adequately considered in the land-use planning and developmental control process.

It provides a decision making process which assists with the understanding of air quality impacts and implications as a result of development proposals. It provides a framework for air quality considerations within local development control processes, promoting a consistent approach to the treatment of air quality issues within development control decisions.

The guidance includes a method for screening the requirement for an air quality assessment, the undertaking of an air quality assessment, the determination of the air quality impact associated with a development proposal and whether this impact is significant.

The guidance also provides some clarification as to when air quality constitutes a material consideration and highlights the linkage with other relevant issues (for example traffic speed reduction measure and the use of alternative technology to provide energy) and the importance of the understanding of these with the input from other discipline specialists. The 'creeping baseline' is another issue raised with regard to cumulative impacts.

The guidance note is widely accepted as the most appropriate reference method for this purpose. This 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 floor space; or,
- Development carried out on land of 1ha or more.

There are two types of air quality impacts 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 a NAQO 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 7.1 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 7.2.

Table 7.1 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 7.2 Indicative Criteria at Stage 2 to determine if an Air Quality Assessment is required

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, ie 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, eg 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 100AADT 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.

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
	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.

7.2 Traffic Data

Caneparo Associates Limited were commissioned to provide transport planning advice to support the proposed development. The Transport Assessment confirms that the proposed development will result in net reduction in car journeys. There are currently three informal car parking spaces that will be removed.

The proposals are likely to result in circa 19-21 delivery trips per day, an increase of 13-14 delivery trips when compared to the existing use of the Site as office floor space. However, the Transport Assessment confirms that the vast majority of deliveries to both the office and retail floor space will be undertaken by light goods vehicles no larger than 4.6t vans, which will not have a material impact on the operation and environmental condition of the public highway.

Based on the above information, the net reduction in traffic movements during the operational phase of the proposed development are expected to improve the traffic conditions on Greville Street and Farringdon Road.

7.2.1 Comparison against EPUK criteria

As seen in section 7.1, the proposals include provision of additional 1104 m^2 of commercial floor space and the Stage 1 criteria for an air quality assessment has been met for the proposed development. Therefore, the assessment has proceeded to Stage 2, and the information relevant to the proposed development has been compared against EPUK's indicative criteria and the results summarised in Table 7.3 below.

Table 7.3 Information relevant to the development to proceed to an air quality assessment.

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment	Information relevant to the proposed development
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 Air Quality Management Area (AQMA). • More than 500 AADT elsewhere.	The TA states that the existing informal car parking spaces to the rear of the building will be removed. Therefore, the proposed development is will lead to 'net' reduction in car movements on the local road network. Therefore, with the location of the proposed development within an AQMA, this criteria has not been met.
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.	Based on TA (January, 2018) this criteria is not considered to be met as the estimated change in delivery movements is expected to be below 25 AADT. Furthermore, it is expected that that the vast majority of deliveries to both the office and retail floor space will be undertaken by light goods vehicles no larger than 4.6t vans, which will not have a material impact on the operation and environmental conditions of the public highway. Therefore, with the location of the proposed development within an AQMA, this criteria has not been met.
3. Realign roads, ie changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA	Not proposed
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, eg. Traffic lights, or roundabouts.	Not proposed

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment	Information relevant to the proposed development
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 100AADT elsewhere.	Not Proposed
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).	Not Proposed
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).	No CHP proposed. However, use of low NO_x boilers have been recommended.
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.	Not proposed.

Based on all of the above information the proposed development is unlikely to affect the air quality at the proposed development site and the impact is considered to be '**Insignificant'**.

7.3 Likely Exposure of Future Receptors

Based on the available information, the sections below discuss the likely exposure of future receptors to the air quality in the area.

7.3.1 Baseline and Background Air Quality

Information from Table.5.1, shows that the monitoring data that is considered representative of the Proposed Development Site (locations LB, CA6 and CA10), the likely air quality is considered acceptable for the proposed non-residential use.

Information from the wind rose (refer Figure 5), although the predominant wind direction is south-westerly, the receptors at the proposed developed site will be located down-wind of the road emissions from the Greville Street.

Annual mean background concentrations from Defra (based on the 2015 background maps) indicate that atmospheric concentrations of PM_{10} and $PM_{2.5}$ are well below the annual mean NAQOs for years 2018, 2019 and 2020.

Annual mean background concentrations from Defra (based on the 2015 background maps) indicate that atmospheric concentrations of NO_2 are above the annual mean NAQOs for 2018 and 2019. However, as the proposed development doesn't include any residential units, the annual mean objective is not applicable.

7.3.2 Air Pollution Map from London Air

The modelled annual pollution maps for NO_2 (refer Figure 6) from the London Air website show that NO_2 concentrations on the Greville Street range between 40 - 43 µg/m^3. Though this is above the annual mean NAQOs, this objective is not applicable to the non-residential use.

7.3.3 Land use in the vicinity of the Proposed Development Site.

The proposed development will be a five-storey building comprising of commercial space. Therefore, it is considered that the proposed development is consistent with the existing land use in the general area.

7.3.4 Summary of the Likely Air Quality at the Proposed Development Site

Based on the information summarised in Section 7.4.1 to 7.4.4, it is considered that the likely air quality at the proposed development site would not introduce new receptors into a location of poor air quality applicable to the proposed non-residential use.

7.3.5 Comparison with Air Pollution and Exposure Criteria (APEC)

Based on the London Councils Air Quality and Planning Guidance and information summarised in the above Sections, the Air Pollution and Exposure Criteria (APEC) for the receptors from the proposed development are likely to belong to the Category APEC – B as shown in Table.7.4 below.

Table.7.4 Significance of exposure to air pollution and the levels of mitigation required, for the following Air Pollution Exposure Criteria (APEC) table:

APEC criteria	Applicable Range NO_2 Annual Mean	Applicable Range PM_{10}	Recommendation
APEC - B	Between 5% below or above national objective	Annual Mean: Between 5% above or below national objective 24 hr: Between one-day above or below national objective.	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered eg Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.

Given that the annual mean objective doesn't apply at the proposed development site, the above information has been provided for 'indicative' purposes only. The actual Air Pollution and Exposure Criteria is expected to be 'APEC – A' and the recommendation is likely to be 'No air quality grounds for refusal; however mitigation of any emissions should be considered.'

8 Air Quality Neutral Assessment

8.1 General

Policy within the London Plan requires development to be 'air quality neutral', the aim of which is to bring forward development that are air quality neutral or better and that do not degrade air quality in areas where air quality objectives are not currently being achieved. The proposed development is located in London Borough of Bexley, which is categorised as an 'Outer' London Borough, and as such the appropriate figures for Outer London were used.

Guidance for undertaking AQNA are given in the following two documents:

- The Air Quality Neutral Planning Support Update 2014;
- Mayor of London Sustainable Design and Construction Supplementary Planning Guidance 2014.

8.2 Method of Assessment

GLA 80371 guidance recommends that the Air Quality Neutral Assessment should focus on the NO_x and PM_{10} emissions and to consider the emissions from the energy sources used within the building and emissions from transport vehicles associated with buildings use.

8.3 Transport Emissions

8.3.1 General

The air quality neutral assessment for the road traffic emissions compares the road traffic emissions from the proposed development with benchmark values based on land usage.

8.3.2 Assessment

The project's TA has provided estimated trip rates for the proposed development; there are an estimated 13-14 delivery trips when compared to the existing use of the Site as office floor space. As it is expected that the vast majority of deliveries to both the office and retail floor space will be undertaken by light goods vehicles no larger than 4.6t vans, the increase is not considered to lead to a material impact on the operation and environmental condition of the public highway. However, these 14 trips (using light goods vehicles) have been used for air quality neutral calculations for transport emissions. It should be noted that as the proposed development will remove the existing three informal car parking spaces, this estimation is considered to represent worst case emissions.

GLA 80371, provides emission factors in terms of g/vehicle-km. Based on these rates, the worst-case annual vehicle emissions associated with the additional vehicle trips are presented in Table 8.1.

Table 8.1 Calculated Emissions for Proposed Traffic

Land use	Annual Traffic Flow (veh/ annum)	Emission rate (g/veh/km)		Average distance travelled by vehicle per trip (km)	All Vehicle (Annual Emissions (kg/yr)	
		NO_x	PM_{10}		NO_x	PM_{10}
Retail (A1)	5110	0.37	0.0665	5.9	11.2	2.0

The benchmark emissions were calculated using the GLA 80371 guidance for the additional commercial space (A1) and increase in office space (B1). The emissions are calculated based on the increase area is presented in Table 8.2.

Table 8.2 Benchmark Emissions for Proposed Development

Land use	Number of dwellings/Site area m^2	Benchmark Emission rate (g/dwelling/annum)		All Vehicle (Annual Emissions (kg/yr)	
		NO_x	PM_{10}	NO_x	PM_{10}
Office (B1)	123	11.4	2.05	1.4	0.3
Commercial (A1-A3)	981	219	39.3	214.8	38.6
Total				**216.2**	**38.9**

The calculated transport emissions of 11.2 kg/yr for NO_x and 2 kg/yr for PM_{10} shown in Table 8.1 are less than the combined NO_x emissions from the office and commercial benchmark emissions of 216.2 kg/yr of NO_x and 38.9 kg/yr of PM_{10} as seen in Table.8.2. The transport related emissions from the proposed development meet the Air Quality Neutral benchmark and therefore no further action is required.

As there is no centralised boilers proposed for the development, Air Quality Neutral calculations for building emissions have not been calculated. However, given the sustainable design nature of the proposed development and proposed use as office and commercial units, the air quality emissions are not expected to be significant.

9 Mitigation and Residual Impact

9.1 Construction Phase

The control of dust emissions from construction activities relies upon management provision and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, even large-scale operations have been successfully undertaken without impacts to nearby properties.

Site specific mitigation measures should be set up based on the risk effects as outlined in Table 6.11. Examples of these measures are provided in the IAQM guidance document. In addition to the 'highly recommended' measures, the IAQM guidance also sets out a number of 'desirable' measures which should also be considered for inclusion within the Construction Environmental Management Plan (CEMP). These are set out in Appendix A.

Following implementation of the measures recommended for inclusion within the CEMP the impact and effect of emissions during the construction stage of the proposed development would be '**Not Significant'**.

9.2 Operational Phase

Based on the information provided in Section 7, the proposed development is not expected to lead to significant impact on local air quality.

The proposed development would not introduce new receptors into a location of existing poor air quality. No mitigation is considered to be required.

9.3 Residual Impacts

By following the mitigation measures outlined in Section 8.1, the residual impacts during the construction phase are likely to be '**Insignificant'**.

No additional measures are required during the operational phase and the residual impacts are considered to be '**Insignificant'**.

10 Conclusions

MLM Consulting Engineers Ltd was commissioned Seaforth Land Holdings Limited (Client) to undertake an Air Quality Assessment in relation to a proposed non-residential development at 20-23 Greville Street, London. The Site falls within the planning jurisdiction of London Borough of Camden (LBC) and the whole of the Borough was declared an Air Quality Management Area (AQMA). A qualitative assessment on air quality for the construction phase (demolition, earthwork, construction and trackout) and operational phase of the development has been carried out.

From the qualitative assessment carried out for the construction phase, it has been determined that the risk of these activities to dust soiling are 'Negligible' to 'Medium' risk, while that towards human health impact are 'Negligible' to 'Low' Risk. Following the implementation of the recommended mitigation measures, the impact of emissions during the construction phase of the development is likely to be 'Not Significant'.

During the operational phase and based on the information available in the Transport Assessment (TA), the Proposed Development is likely to result in a 'net' reduction in vehicle trips on the surrounding road network. The air quality impact of the proposed development during the operational phase is considered to be 'insignificant'.

Based on the relevant local air quality monitoring data, the air pollution maps from London Air and background concentrations from Defra, the estimated NO_2 concentrations at the proposed development site would be below the relevant NAQOs for the proposed use as non-residential. Therefore, the proposed development would not introduce new receptors into an area of poor air quality.

The Air Quality Neutral Assessment (AQNA) carried out for the transport related emissions from the proposed development meet the benchmark emissions.

Air quality constitutes a material consideration in the determination of planning applications. However, given that the proposed development is for non-residential use and with the effective implementation of recommended mitigation measures, it is considered that air quality should not present a constraint to the granting of planning permission for the proposed development.

11 References

1 The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (SPG). July 2014. Greater London Authority (GLA).

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14 Revised Early Minor Alterations Consistency with the National Planning Policy Framework
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20 Camden's Clean Air Action Plan 2016-2018. LBC (2016).
21 MAGIC website: http://www.magic.gov.uk/
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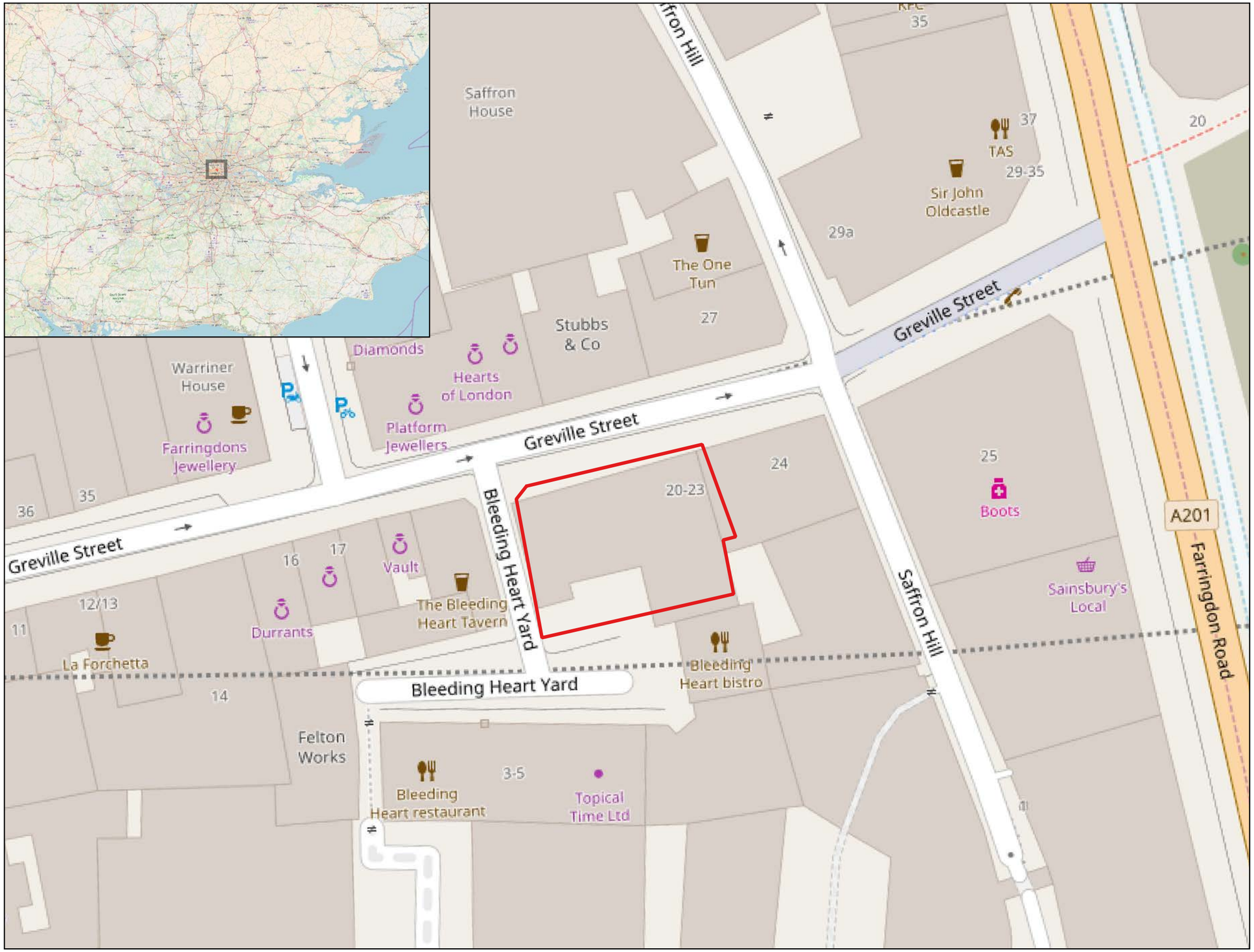
Figures

LEGEND

SITE LOCATION



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THIS DRAWING IS INDICATIVE ONLY

COORDINATE SYSTEM: BRITISH NATIONAL GRID
UNITS: METRE
SCALE: 1:500
BASEMAP SOURCE: OPEN STREET MAP

REV	DATE	DESCRIPTION	MADE	CKD

MLM. Group

DRAWING STATUS: FINAL

CLIENT: SEAFORTH LAND HOLDINGS LIMITED

PROJECT: 20-23, GREVILLE STREET, LONDON

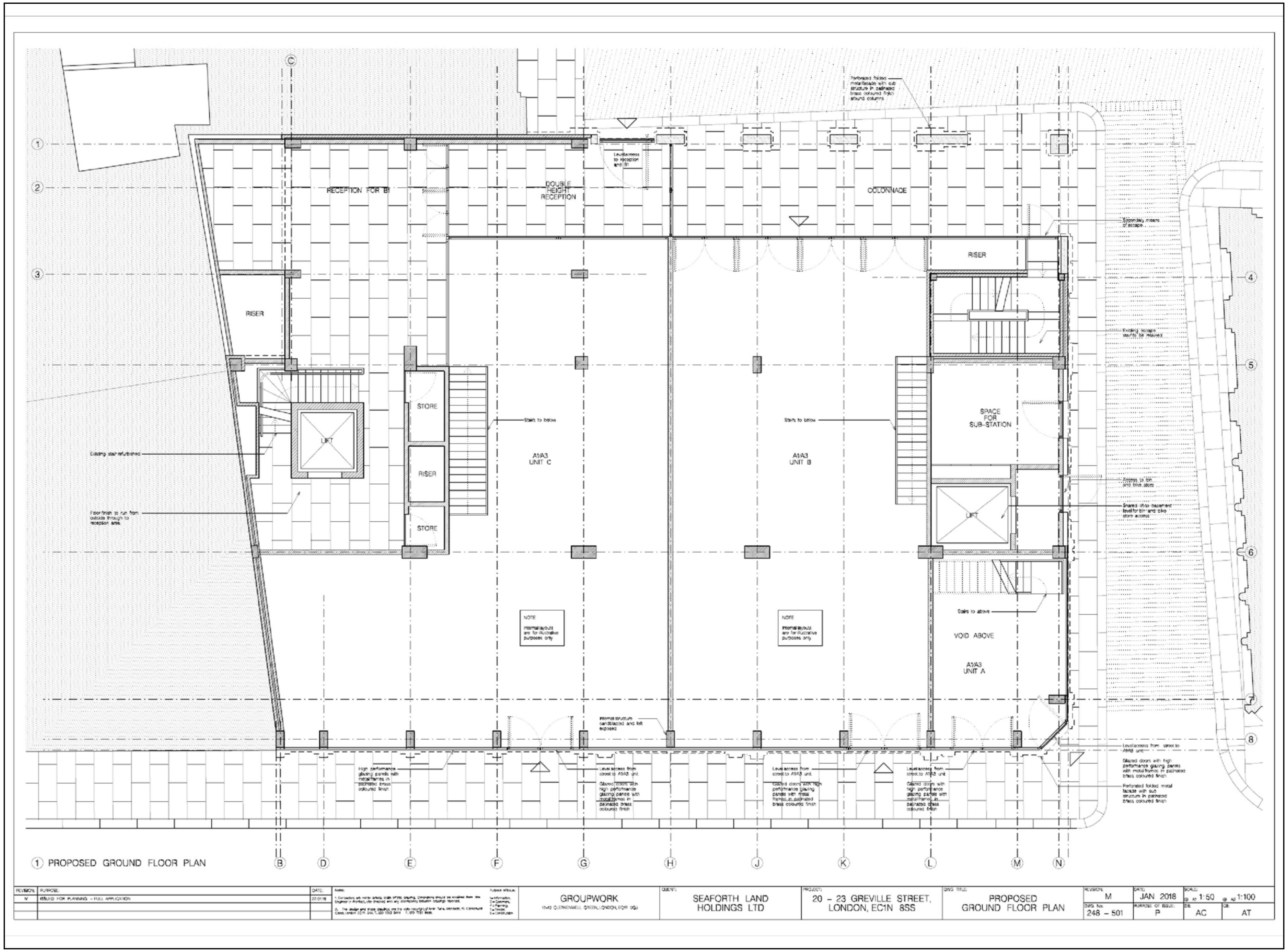
DRAWING TITLE: SITE LOCATION

DRAWN/DESIGN:	SSR	DATE:	16/04/2018	STATUS:	S2
CHECKED:	KN	APPROVED:	KN	REVISION:	C01

DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 1

LEGEND

PROPOSED GROUND FLOOR LAYOUT



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COORDINATE SYSTEM: BRITISH NATIONAL GRID

REV	DATE	DESCRIPTION	MADE	CKD

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DRAWING STATUS: FINAL

CLIENT: SEAFORTH LAND HOLDING LIMITED

PROJECT: 20-23, GREVILLE STREET, LONDON

DRAWING TITLE: PROPOSED SITE LAYOUT

DRAWN/DESIGN:	SSR	DATE:	16/04/2018	STATUS:	S2
CHECKED:	KN	APPROVED:	KN	REVISION:	C01

DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 2

LEGEND

- SITE BOUNDARY
- AQMA
- AUTOMATIC SITES
- DIFFUSION TUBE SITES

0 200 400 600 m

THIS DRAWING IS INDICATIVE ONLY

COORDINATE SYSTEM: BRITISH NATIONAL GRID
UNITS: METRE
SCALE: 1:15,107
BASEMAP SOURCE: OPEN SOURCE

REV	DATE	DESCRIPTION	MADE	CKD

MLM. Group

DRAWING STATUS: FINAL

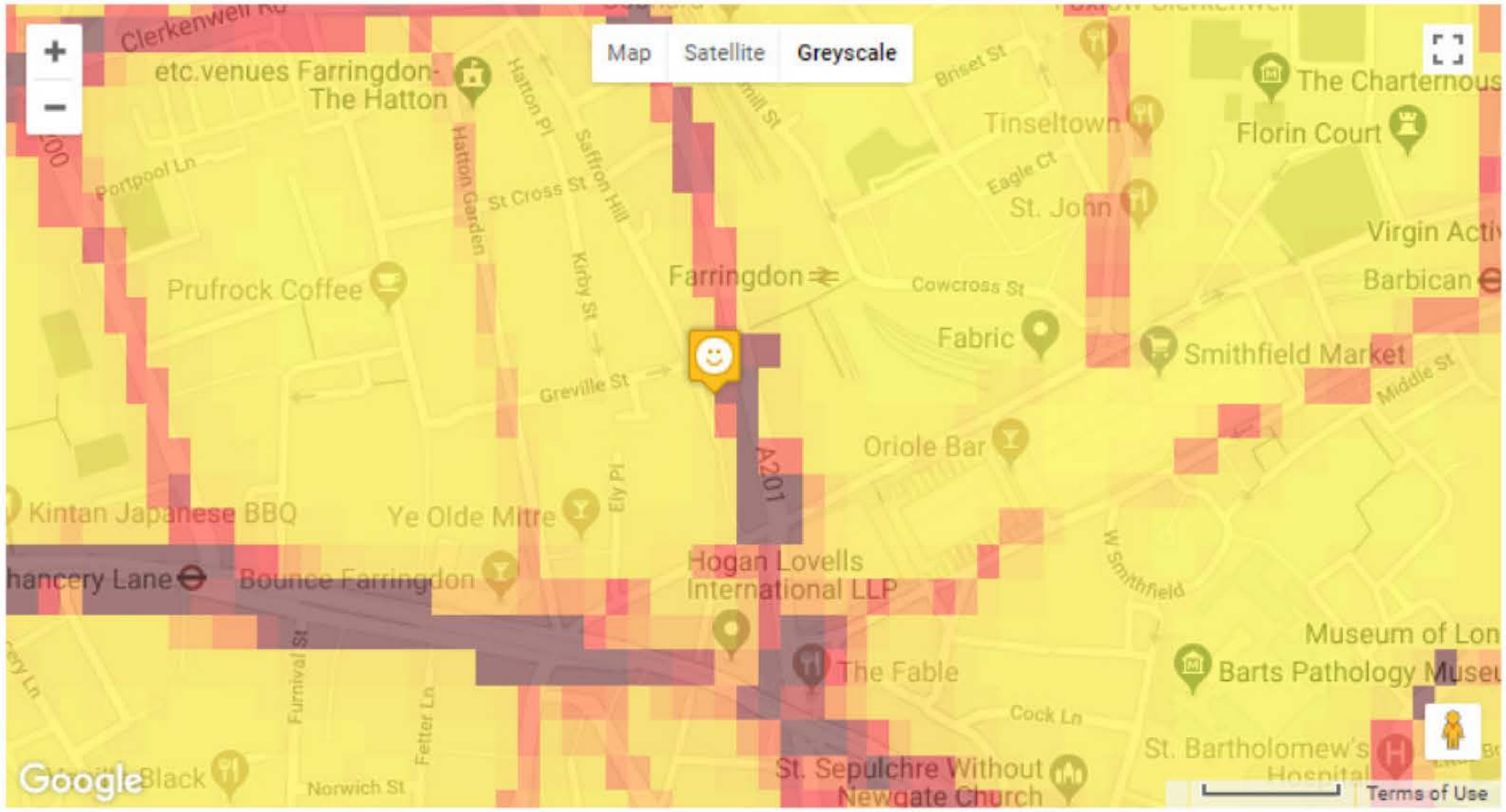
CLIENT: SEAFORTH LAND HOLDINGS LIMITED

PROJECT: 20-23, GREVILLE STREET, LONDON

DRAWING TITLE: LOCATION OF SITE IN RELATION TO LOCAL AUTHORITY MONITORING POINTS

DRAWN/DESIGN:	SSR	DATE:	16/04/2018	STATUS:	S2
CHECKED:	KN	APPROVED:	KN	REVISION:	C01

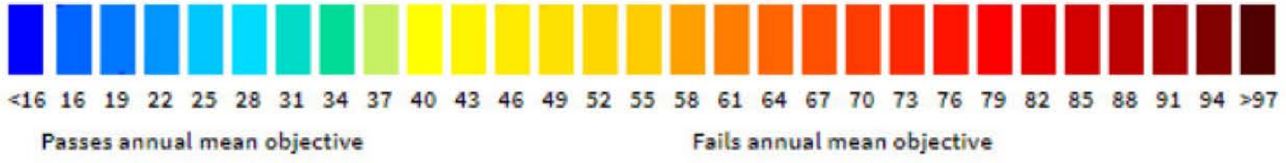
DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 3



Modelled annual mean NO2 air pollution, based on measurements made during *2013*.

This map was used with permission from The Greater London Authority and Transport for London, who fund, develop and maintain the London Atmospheric Emissions Inventory. For more information please visit data.london.gov.uk

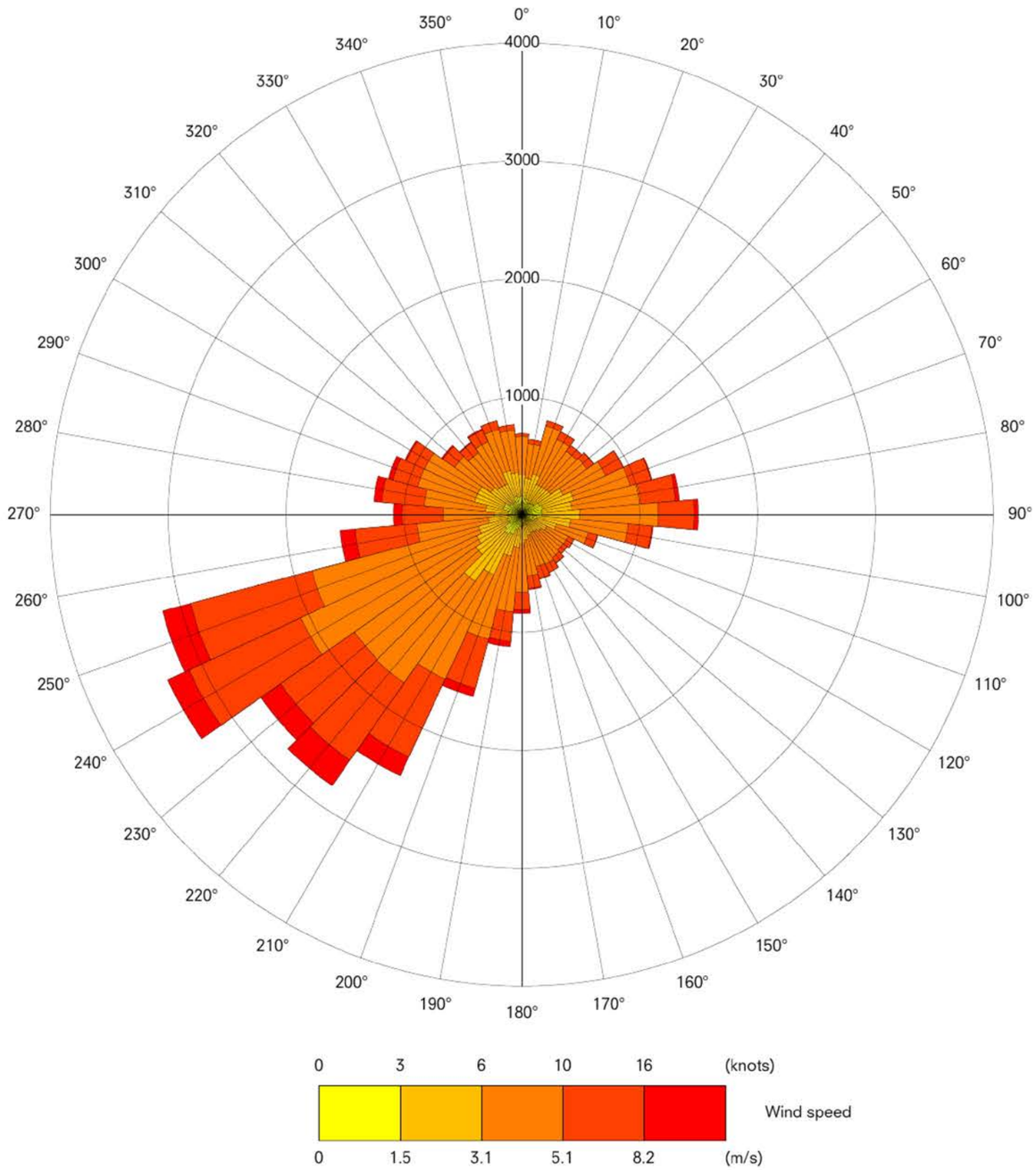
Key: Annual mean NO2 air pollution for 2013, in microgrammes per metre cubed (ug/m3)



REV	DATE	DESCRIPTION	MADE	CKD

MLM. Group

DRAWING STATUS: FINAL			DRAWING TITLE: LONDON AIR POLLUTION MAP FROM LONDON AIR		
CLIENT: SEAFORTH LAND HOLDINGS LIMITED	DRAWN/DESIGN: SSR	DATE: 16/04/2018	STATUS: S2		
	CHECKED: KN	APPROVED: KN	REVISION: C01		
PROJECT: 20-23, GREVILLE STREET, LONDON	DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 4				



REV	DATE	DESCRIPTION	MADE	CKD

MLM. Group

DRAWING STATUS: FINAL

DRAWING TITLE: WIND ROSE FROM LONDON CITY AIRPORT STATION 2012-2016

CLIENT: SEAFORTH LAND HOLDINGS LIMITED

DRAWN/DESIGN:	SSR	DATE:	16/04/2016	STATUS:	S2
CHECKED:	KN	APPROVED:	KN	REVISION:	C01

PROJECT: 20-23, GREVILLE STREET, LONDON

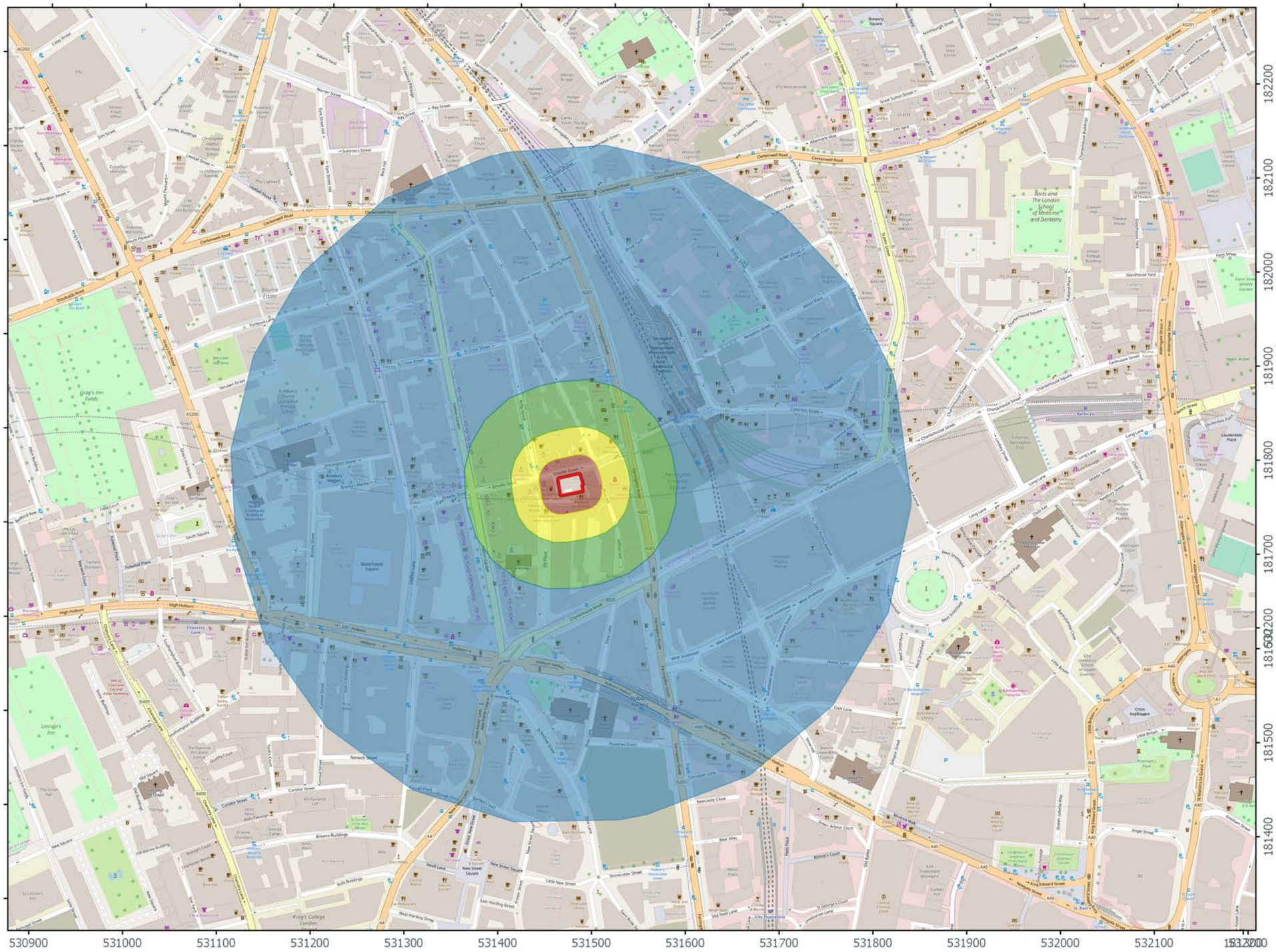
DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 5

LEGEND

SITE BOUNDARY

CONSTRUCTION DUST BUFFERS

- 20M
- 50M
- 100M
- 350M



0 100 200 300 m

THIS DRAWING IS INDICATIVE ONLY

COORDINATE SYSTEM: BRITISH NATIONAL GRID
UNITS: METRE
SCALE: 1:7,000
BASEMAP SOURCE: OPEN STREET MAP

REV	DATE	DESCRIPTION	MADE	CKD

MLM. Group

DRAWING STATUS: FINAL

DRAWING TITLE: CONSTRUCTION DUST RISK ASSESSMENT BUFFER ZONES

CLIENT: SEAFORTH LAND HOLDINGS LIMITED

DRAWN/DESIGN:	SSR	DATE:	16/04/2018	STATUS:	S2
CHECKED:	KN	APPROVED:	KN	REVISION:	C01

PROJECT: 20-23, GREVILLE STREET, LONDON

DRAWING NO: 776327-MLM-ZZ-XX-DR-J-FIGURE 6

Appendix A - Dust Mitigation Measures

It is recommended that the 'desirable' and 'highly recommended' measures set out below are incorporated into the CEMP and approved by LBC prior to commencement of any work on site. The 'desirable' measures are shown in *italics*.

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of the person accountable for air quality and dust issues on the site boundary (ie the environment manager/engineer or site manager);
- Display the head or regional office contact information on the site boundary;
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
- Record all dust and air quality complaints, identify cause, take appropriate measures to reduce emissions in a timely manner and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site and the action taken to resolve the situation in the log book;
- *Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.*
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results and make inspection log available to LBB when asked;
- Increase frequency of site inspection by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged periods of dry or windy conditions;
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles;
- Fully enclose site or specific operations where there is a high potential for dust production and the activities are being undertaken for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If being re-used on site, cover as detailed below;
- Cover, seed or fence stockpiles to prevent wind whipping;
- Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable;
- *Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas;*
- Produce a construction logistic plan to manage the sustainable delivery of goods and materials;
- *Implement a Travel Plan that supports and encourages sustainable travel;*
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction eg suitable local exhaust ventilation systems;

- Ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and 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.
- Avoid bonfires and burning of waste materials.

Measures specific to demolition

- *Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).*
- Ensure 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 needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures specific to construction

- *Avoid scabbling (roughening of concrete surfaces) if possible*
- *Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;*

Measures specific to trackout

- *Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.*
- *Avoid dry sweeping of large areas.*
- *Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.*
- *Record all inspections of haul routes and any subsequent action in a site log book.*
- *Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).*

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