

Report for:

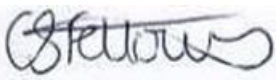
John Filbee Properties Ltd

816 Oxford Road, Reading

Air Quality Assessment

Status: Final

Date: 20.09.2021

Author	 Chloe Fellows Air Quality Consultant
Reviewed & Approved By	 Graham Parry Managing Director
Report For	John Filbee Properties Ltd The Chase The Warren Caversham Reading RG4 7TQ
Date	20.09.2021
Version Number	A4337/AQ/01
Status	Final

This report has been prepared by ACCON UK Limited with all reasonable care and diligence within the terms of the contract with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. We accept no responsibility to third parties to whom this report, or any part, thereof is made available. Any such party relies upon the report at their own risk.

Contents

1.	Introduction.....	5
2.	Air Pollution Policy Context	6
2.1.	Legislation.....	6
2.2.	Planning Policy.....	9
2.3.	Relevant Guidance.....	12
3.	Site Description and Baseline Conditions.....	13
3.1.	Site Description.....	13
3.2.	Local Air Quality Monitoring.....	13
3.3.	Background Concentration of Air Pollutants.....	14
4.	Methodology of Assessment and assessment criteria	15
4.1.	Methodology	15
4.2.	Construction Phase Dust Emission Assessment	15
4.3.	ADMS Roads Modelling of Pollutant Concentrations.....	16
4.4.	Model Set-up Parameters	16
4.5.	Applying the AQS to this Development	17
4.6.	Construction Phase Assessment Criteria.....	17
4.7.	Operational Phase Assessment Criteria	18
4.8.	Traffic Data	18
4.9.	Validation and Verification of the Model	19
5.	Impacts and Constraints of Air quality	21
5.1.	Construction Phase Assessment.....	21
5.2.	Operational Impact Assessment.....	23
5.3.	Predicted Air Quality Constraints on the Development.....	25
6.	Mitigation	27
6.1.	Construction Phase.....	27
6.2.	Operation Phase	29
7.	Conclusions.....	30
	Appendices	31
	Appendix 1: Glossary of Terms	32
	Appendix 2: Air Quality Standards.....	33
	Appendix 3: 2019 Heathrow Airport Wind Rose	34
	Appendix 4: Proposed Development – Ground Floor Receptor Locations	35

List of Tables

Table 2.1: UK Air Quality Objectives for NO ₂ , PM ₁₀ and PM _{2.5}	7
Table 2.2 Examples of where AQS should be applied	7
Table 3.1: Local Monitoring Data Suitable for Model Verification.....	14
Table 3.2: Background Concentrations of Pollutants	14
Table 4.1: 2019 Traffic Flow Data for Verification.....	18
Table 4.2: 2023 Opening Year Traffic Flow Data	19
Table 4.3: NO ₂ Annual Mean Verification for 2019	20
Table 5.1: Potential Dust Emission Magnitude	22
Table 5.2: Sensitivity of the Study Area.....	22
Table 5.3: Summary Dust Risk Table to Define Site Specific Mitigation.....	23
Table 5.4: Modelled 2023 Total NO ₂ Concentrations – Existing Receptors.....	24
Table 5.5: Modelled 2023 Total PM ₁₀ Concentrations – Existing Receptors	24
Table 5.6: Modelled 2023 Total PM _{2.5} Concentrations – Existing Receptors	24
Table 5.7: Modelled 2023 NO ₂ Concentrations – Development Receptors	26
Table 5.8: Modelled 2023 PM ₁₀ and PM _{2.5} Concentrations – Development Receptors	26

1. INTRODUCTION

ACCON UK Limited (ACCON) has been commissioned by Weston & Co Architects Limited on behalf of John Filbee Properties Ltd to provide an air quality assessment for the proposed development at 816 Oxford Road, Reading. The site is located within the administrative boundary of Reading Borough Council.

The existing site comprises of 1-2 storey light industrial buildings which have been vacant for some time. The proposed development involves the demolition of the existing building and the erection of two new residential blocks to provide 25 new residential dwellings. The site fronts onto Oxford Road (A329).

It is considered that the proposed development may have a temporary impact on local air quality during the construction phase, with a potential for nuisance through the generation of dust and particulate matter. Further to this, the proposals may introduce future occupants to existing air quality issues at the site, given the site is located in an urban setting surrounded by heavily trafficked roads and its location within the city-wide AQMA.

This assessment has been completed in order to determine whether the proposed development achieves compliance against the National Air Quality Objectives (NAQOs), along with National and Local Planning Policy. The assessment has been undertaken in accordance with the Department for Environment, Food and Rural Affairs' (DEFRA) current Technical Guidance on Local Air Quality Management (LAQM.TG16.)¹ and covers the effects of local air quality on the development.

The report assesses the overall pollutant concentrations of nitrogen dioxide (NO₂) and particulates (PM₁₀ and PM_{2.5}) at the proposed development site. A glossary of terms is detailed in **Appendix 1** and the location of the site is shown in **Section 3.1**. The development plans for the site with development receptor locations are identified in **Appendix 4**. It is intended that the proposed development will be occupied by 2023 at the earliest.

The potential air quality constraints on the development and impacts on local air quality have been assessed on the basis of the findings of detailed dispersion modelling using ADMS Roads (version 5.0.0.1), which has been undertaken in the context of relevant NAQOs, emission limit values and relevant guidance.

¹ DEFRA, 2018, Local Air Quality Management Technical Guidance (TG16).

2. AIR POLLUTION POLICY CONTEXT

2.1. Legislation

2.1.1. Air Quality Strategy and Local Air Quality Management (LAQM)

Part IV of the Environment Act 1995 requires the Secretary of State to publish an Air Quality Strategy (AQS) and Local Authorities (LAs) to review and assess the quality of air within their boundaries.² The latter has become known as Local Air Quality Management (LAQM), an instrument by which the Government's air quality objectives are to be achieved over a determined period of time.

The AQS provides the policy framework for local air quality management and assessment in the UK. It sets out air quality standards and objectives for key air pollutants which are designed to improve air quality and protect human health and the environment from the effects of pollution. These terms are defined below:

- The 'standards' are set at concentrations below which health effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of a particular pollutant.
- The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of the costs, benefits, feasibility and practicality of achieving the standards. The air quality standards and objectives are outlined in **Appendix 2**.

As part of this LAQM role, LAs are required to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. Where a LA identifies areas of non-compliance with the Air Quality Objectives (AQOs)³ of pollutants of concern, and there is relevant public exposure, there remains a statutory need to declare the geographic extent of non-compliance as an Air Quality Management Area (AQMA) and to draw up an action plan detailing appropriate measures and policies that can be introduced in order to work towards achieving the objective(s).

The objectives for use by LAs are prescribed within the Air Quality (England) Regulations 2000⁴, and the Air Quality (England) (Amendment) Regulations 2002⁵. The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are summarised in **Table 2.1**. The objectives for NO₂ and PM₁₀ were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. The PM_{2.5} objective was to be achieved by 2020. It should be noted that LAs in England have a flexible role in working towards reducing emissions and concentrations of PM_{2.5}.

² In 1997, the United Kingdom National Air Quality Strategy (NAQS) was published in response to the Environment Act of 1995, setting out a framework of standards and objectives for the air pollutants of most concern (SO₂, PM₁₀, NO_x, CO, lead, benzene, 1,3-butadiene and tropospheric ozone), to be achieved by local authorities through a system of Local Air Quality Management (LAQM) by 2005. The aim of the strategy was to reduce the air pollutant impact on human health by reducing airborne concentrations. A review of the NAQS led to the publication of Air Quality Strategy for England, Scotland, Wales and Northern Ireland in January 2000, whilst in July 2007 was further reviewed with various amendments to the Air Quality Objectives for local authorities.

³ Defra, 2018, Local Air Quality Management Technical Guidance (TG16)

⁴ The Stationary Office (2000) Statutory Instrument 2000, The Air Quality (England) Regulations 2000, London

⁵ The Stationary Office (2002) Statutory Instrument 2002, The Air Quality (England) (Amendment) Regulations 2002, London

Table 2.1: UK Air Quality Objectives for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Objectives	Averaging Period
Nitrogen dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ not to be exceeded more than 35 times a year	24-hour mean
	40µg/m ³	Annual mean
Particulate Matter (PM _{2.5})*	Work towards reducing emissions/ concentrations of fine particulate matter (PM _{2.5})	Annual mean

* The PM_{2.5} objective, which is to be met by 2020, is not in (Air Quality England) Regulations and there is no requirement for local authorities to assess it, although they are encouraged to do so.

The AQS objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objective. **Table 2.2** identifies examples of where the annual mean objectives should apply as provided in LAQM.TG16⁶, and include: building facades of residential properties⁷, schools, hospitals, etc. The annual mean objectives are not relevant for the building facades of offices or other places of work where members of the public do not have regular access, kerbsides or gardens. The 24-hour mean objective applies to all locations where the annual mean objective would apply, together with hotels and gardens of residential properties. The 1-hour mean objective also applies at these locations as well as at any outdoor location where a member of the public might reasonably be expected to stay for 1-hour or more, such as shopping streets, parks and sports grounds, as well as bus stations and railway stations that are not fully enclosed.

Table 2.2 Examples of where AQS should be applied

Averaging Period	AQS Should Apply	AQS Should Not Apply
Annual Mean	All locations where members of the public might be regularly exposed. Building facades of: - Residential properties* - Schools - Hospitals - Care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. - Hotels, unless people live there as their permanent residence. - Residential gardens - Kerbside sites or any other location where public exposure is expected to be short term.

⁶ Such locations should represent parts of the garden where relevant public exposure is likely, for example where there are seating or play areas. It is unlikely that relevant public exposure would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.

⁷ Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

Averaging Period	AQS Should Apply	AQS Should Not Apply
24-hour and 8-hour mean	All locations where the annual mean objective would apply. - Hotels - Residential gardens	Kerbside sites or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. - Kerbside sites (e.g. pavements of busy shopping streets) - Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might spend one hour or more. - Any outdoor locations where members of the public might spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

*Such locations should represent parts of the garden where relevant public exposure is likely, for example where there are seating or play areas. It is unlikely that relevant public exposure would occur at the extremities of the garden boundary, or in front gardens, although local adjustment should always be applied.

2.1.2. Clean Air Strategy

The Clean Air Strategy 2019⁸ was released in January 2019 and supersedes the policies featured in The National Air Quality Strategy. The strategy mainly deals with how to improve air quality in England but also discusses air quality policy in the devolved administrations. In comparison with the previous strategies, it has a more joined-up approach incorporating transport, domestic, industrial and agricultural emission reduction policies with a combined focus on both ambient and indoor air quality. The plan also has an emphasis on the proposal to use Clean Air Zones (CAZs) and the ULEZ (in London) to quickly bring highly polluted urban centres below the legal limits. Some of the key policies in the plan are a renewed consideration of under-used Smoke Control Areas due to the growth of highly polluting domestic wood burning stoves, new best practices being incorporated into the agricultural sector to reduce ammonia emissions (and their associated secondary particulates) and with a policy to prohibit the sale of new petrol and diesel cars by 2040. However, air quality objective limits outlined in the document are largely unchanged from the previous strategy.

2.1.3. Dust Legislation

Section 79 of Part III of the Environmental Protection Act (1990)⁹ gives the following definitions of statutory nuisance relevant to dust and particles:

⁸ DEFRA, 2019, The Clean Air Strategy 2019

⁹ Environmental Protection Act (1990) – Part III

‘Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance’, and ‘Any accumulation or deposit which is prejudicial to health or a nuisance’.

Following this, Section 80 states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

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.

Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can potentially require that there shall be no dust beyond the boundary of the works. The only defence is to identify that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.2. Planning Policy

2.2.1. National Planning Policy

The National Planning Policy Framework (NPPF) was first published on 27th March 2012 and updated on 24th July 2018, 19th February 2019, and most recently on 20th July 2021. This sets out the government’s planning policies for England and how these are expected to be applied.

The NPPF¹⁰ “sets out the Government’s planning policies for England and how these should be applied and provides a framework within which locally-prepared plans for housing and other development can be produced.” It includes advice on when air quality should be a material consideration in development control decisions. Relevant sections are set out below:

Section 9 - Promoting sustainable transport:

Paragraph 105

“The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.”

Section 15 - Conserving and enhancing the natural environment:

Paragraph 174 Bullet point ‘e’:

¹⁰ Ministry of Housing, Communities and Local Government, 2021, National Planning Policy Framework

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

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

Paragraph 186:

“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.”

The NPPF is accompanied by relevant Planning Practice Guidance (PPG)¹¹, a web-based resource which brings together planning guidance on various topics into one place. A specific guidance in respect to air quality is provided where the guiding principles on how planning can take account of the impact of new development on air quality is included. The PPG states that:

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

The PPG sets out the information that has to be considered when deciding whether an air quality assessment may be required for a planning application, stating that:

Where air quality is a relevant consideration the local planning authority may need to establish:

- the ‘baseline’ local air quality, including what would happen to air quality in the absence of the development;*
- whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and*
- whether occupiers or users of the development could experience poor living conditions or health due to poor air quality.*

¹¹ GOV.UK. (2014). Air quality. [online] Available at: <https://www.gov.uk/guidance/air-quality--3> [Accessed 07 October 2020].

It also provides guidance on options for mitigating air quality impacts, and makes clear that:

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

Examples of mitigation include:

- *Where air quality is a relevant consideration the local planning authority may need to establish:*
- *the ‘baseline’ local air quality, including what would happen to air quality in the absence of the development;*
- *whether the proposed development could significantly change air quality during the construction and operational phases (and the consequences of this for public health and biodiversity); and*
- *whether occupiers or users of the development could experience poor living conditions or health due to poor air quality.*

2.2.2. Local Planning Policy

A new Reading Borough Local Plan was adopted on 4th November 2019. The document sets out the planning policies for development in Reading up to 2036, and is the main consideration in deciding planning applications.

The Local Plan replaces the previous development plans – the Core Strategy, Reading Central Area Action Plan and Sites and Detailed Policies Document – which no longer apply.

The Local Plan is the document that guides development in Reading up to 2036, and it will therefore play a decisive role in how the town evolves over the next two decades. It will be the main point of reference for anyone wishing to undertake new buildings, changes or developments within Reading over that period.

Within the Local Plan there is one policy directly relating to air quality in the Borough area, EN15: Air Quality, which states:

Development should have regard to the need to improve air quality and reduce the effects of poor air quality.

- Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:*
 - *Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
 - *Whether the development is within, or accessed via, an Air Quality Management Area; and*

- *Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*
- ii. *Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.*
- iii. *Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring.*

2.3. Relevant Guidance

2.3.1. Local Air Quality Management Technical Guidance (TG16)

DEFRA's Technical Guidance LAQM (TG16)¹² provides guidance in respect of the local air quality; whilst this primarily addresses LAQM activities, the guidance provides relevant methods concerning treatment and interpretation of data. The methodology in LAQM.TG16 directs air quality professionals to a number of tools published by DEFRA to predict and manage air quality. DEFRA regularly updates its Technical Guidance, with the latest LAQM Technical Guidance (TG16) published in February 2018.

2.3.2. Land-Use Planning & Development Control: Planning for Air Quality (IAQM, 2017)

This guidance¹³ has been produced by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) to ensure that air quality is adequately considered in the land-use planning and development control process. This guidance, of itself, can have no formal or legal status and is not intended to replace other guidance that does have this status. This document has been developed for professionals operating within the planning system. It provides them with a means of reaching sound decisions, having regard to the air quality implications of development proposals. This guidance is particularly applicable to assessing the impacts of traffic and energy centre emissions and provides advice how to describe air quality impacts and their significance.

¹² DEFRA, 2018, Local Air Quality Management Technical Guidance (TG16)

¹³ Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

3. SITE DESCRIPTION AND BASELINE CONDITIONS

3.1. Site Description

The existing site comprises a collection of 1-2 storey light industrial buildings which have been vacant for some time and fronts on to the A329 Oxford Road.

The site location is presented in **Figure 3.1** and the development plan in **Appendix 4**.

Figure 3.1: Site Location Plan



3.2. Local Air Quality Monitoring

Reading Borough Council (RBC) have an air quality monitoring network consisting of diffusion tubes and continuous monitors.

The diffusion tubes closest to the site with appropriate traffic data were utilised for the model verification. These diffusion tubes and their 2019 annual mean NO₂ concentrations for the monitoring sites are identified in **Table 3.1**. The annual mean NO₂ NAQO was not exceeded at the monitoring locations used for verification, however one tube (site 744) was close to exceedance.

Table 3.1: Local Monitoring Data Suitable for Model Verification

Monitor Site	Grid Reference		2019 Annual Mean NO ₂ (µg/m ³)	2019 Data Capture (%)
	X	Y		
RD3	468700	174126	26	99
689 Oxford Rd	468978	173895	35	100
744 Oxford Rd	468967	173935	39	100

3.3. Background Concentration of Air Pollutants

Background concentrations of air pollutants for the modelling were obtained from the DEFRA pollutant concentration maps ¹⁴. The proposed development model utilised background concentrations based on data from a base year of 2019. **Table 3.2** identifies the background pollutant concentrations at the monitoring locations, existing receptors and the proposed development site. All of the estimated background concentrations for annual mean NO₂ and PM₁₀ used in the assessment are below the annual mean objective limit of 40µg/m³ in 2019 and 2023.

Table 3.2: Background Concentrations of Pollutants

Location and Year	NO _x µg/m ³	NO ₂ µg/m ³	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³
2019 Verification – RD3 (468500, 174500)	23.1	16.4	15.3	10.7
2019 Verification – 689 & 744 Oxford Road (468500, 173500)	19.0	13.9	15.9	11.3
2023 - Development Receptors and Existing Receptors (1, 2 & 3) (473500, 172500)	20.2	14.6	14.5	10.0
2023 - Existing Receptors (4 & 5) (473500, 172500)	16.5	12.2	15.1	10.7

Note: In 2023 the ratio between PM₁₀ and PM_{2.5} at the Proposed Development receptors is 0.69.

¹⁴ DEFRA, *Background Mapping Data for Local Authorities- 2018* [online] Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

4. METHODOLOGY OF ASSESSEMENT AND ASSESSMENT CRITERIA

4.1. Methodology

In the UK, DEFRA provides guidance on the most appropriate methods to estimate pollutant concentrations for use in Local Air Quality Management (LAQM). DEFRA regularly updates its Technical Guidance, with the latest LAQM Technical Guidance (TG16)¹⁵ published in February 2018. The methodology in LAQM.TG16 directs air quality professionals to a number of tools published by DEFRA to predict and manage air quality. For example, it is necessary to use the updated NO_x to NO₂ calculator to derive NO₂ concentrations from the NO_x outputs from ADMS Roads modelling.

In order to determine the extent to which air quality issues will affect the development of the site, the study has considered the following:

- Any air quality measurements carried out in the area near the proposed development; and
- The most recent Air Quality Review and Assessment Reports from RBC.

4.2. Construction Phase Dust Emission Assessment

There is the potential for fugitive dust emissions to occur because of construction phase activities. An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM₁₀ during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the proposed development provided by the Client and Project Team; and professional judgement.

The IAQM assessment is undertaken where there are: 'human receptors' within 350m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased PM₁₀ in the ambient air will have the greatest impact on local air quality at sensitive receptors.

The proposed development is located within an urban area and therefore there are a number of 'human receptors' located within the distances defined above. The effects at these receptors have therefore been considered within the following assessment. It should be noted that there are no relevant ecological receptors located within the distances defined above and therefore no further consideration has been given to ecological receptors.

The assessment considers the risk of potential dust and PM₁₀ impacts from the following four sources:

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

It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM₁₀ levels to assign a level of risk. Risks are

¹⁵ DEFRA, 2018, Local Air quality Management Technical Guidance (TG16)

described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.

In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the site and in the vicinity of the site itself.

As information on the number of vehicles and plant associated with each part of the construction phase is not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the proposed development;
- The number and proximity of sensitive receptors to the Application Site and along the likely routes to be used by construction vehicles; and
- The likely duration of the construction phase and the nature of the construction activities undertaken.

4.3. ADMS Roads Modelling of Pollutant Concentrations

To assess pollutant concentrations across the development site, consideration was made of the proximity of the site to major roads and background pollution concentrations. In order to predict NO₂ and PM₁₀ concentrations across the Site, the advanced dispersion model ADMS Roads (version 5.0.0.1) has been used. ADMS-Roads was and continues to be developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

This model uses detailed information regarding traffic flows on the local road network, surface roughness, and local meteorological conditions to predict pollutant concentrations at specific receptors locations, as determined by the user which are detailed in the following Section.

4.4. Model Set-up Parameters

4.4.1. Emission Factors

The most recent Emissions Factor Toolkit (EFT, version 10.1, August 2020) issued by DEFRA was used to derive emissions rates (in grams per kilometre) for vehicle movements along roads incorporated into the model for the models modelling the proposed development. This version of the EFT takes into consideration the following information available from the National Atmospheric Emissions Inventory (NAEI); the fleet composition data for motorways, urban and rural roads in the UK (excluding London), fleet composition based on European emission standards from pre-Euro I to Euro 6/VI (including Euro 6 subcategories), the scaling factors reflecting improvements in the quality of fuel and some degree of retrofitting and the technology conversions in the national fleet. The EFT has been produced by DEFRA and incorporates COPERT 5 vehicle emission factors and fleet information. Emission factors are available for all years between 2018 and 2030 and take into account the most recent evidence relating to factors such as advances in vehicle and exhaust

technology and changes in composition of the vehicle fleet; the emission factors consequently reduce over time.

Version 10.1 of the EFT was produced by DEFRA in response to changes in 'real world' vehicle emissions. As such, it has been assumed that the EFT produces reliable emission factors which are suitable for dispersion modelling as it is the most up-to-date tool provided by DEFRA.

4.4.2. Meteorological Data

Meteorological data, such as wind speed and direction, is used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in the model was obtained from the Met Office observing station at Heathrow Airport. This station is located approximately 37km south west of the proposed development and is considered to provide representative data for the assessment. The meteorological data used for this assessment was from 2019. The wind rose is shown in **Appendix 3**.

4.4.3. Roughness Length

The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A z_0 of 1.0m was used to describe the modelling extents. This value of z_0 is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'Cities and Woodlands'.

A z_0 of 1.5m was used to describe the meteorological site. This value of z_0 is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for 'large urban area'.

4.4.4. Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 30m was used to describe the modelling extents. This value is considered appropriate 'Cities and Large Towns'.

4.5. Applying the AQS to this Development

As this planning application is for residential properties, the AQS calendar year limit value will be considered.

4.6. Construction Phase Assessment Criteria

The IAQM assessment methodology recommends that significance is only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

The significance of effects of exhaust emissions (NO_2 and PM_{10}) arising from construction vehicles and on-site plant during the construction phase of the proposed development have been evaluated qualitatively using professional judgement and the principles of the EPUK significance criteria described below for operational phase impacts.

4.7. Operational Phase Assessment Criteria

A detailed assessment was considered appropriate for this proposed development with model results being verified against local monitoring data. This was undertaken using the detailed dispersion model ADMS Roads.

The main pollutants of concern are generally considered to be NO₂ and PM₁₀ for road traffic. The ADMS Roads methodology has been used for this assessment to predict the constraints on the Site.

For the assessment, the following scenarios were considered:

- 2019 Model Verification;
- 2023 Opening Year without Development; and
- 2023 Opening Year with Development.

4.8. Traffic Data

The ADMS Roads prediction model requires the user to provide various input data, including the Annual Average Daily Traffic (AADT) flow, the number of heavy-duty vehicles (HDVs), the distance of the road centreline from the receptors and vehicle speeds.

As no Transport Assessment has been prepared in support of the application, site specific traffic data is therefore not available for use within the assessment. Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition, was therefore obtained from the Department for Transport (DfT) Road Traffic Statistics. Road traffic open data provides street-level data for every junction-to-junction link on the motorway and 'A' road network, and for some minor roads in Great Britain. This data is considered to provide a reasonable estimate of traffic flow in the vicinity of the site.

Operational traffic data were projected using the traffic growth projection factor derived by the Department for Transport (DfT)'S TEMPro model (version 7.2c). This software package has been developed by the DfT to calculate future traffic growth within the UK.

The traffic information is detailed in **Table 4.1** and **Table 4.2** below for the verification and assessment scenarios. Road widths were estimated from aerial photography and UK highway design standards.

Table 4.1 identifies the traffic data for 2019 which was utilised for the verification. Vehicle speeds were based on speed estimations and were subsequently adjusted where it was deemed, they were not sufficiently accurate, e.g. at junctions, crossings, etc.

Table 4.1: 2019 Traffic Flow Data for Verification

Monitoring Site Road Section	AADT	Speed (km/h)	HDV%
A329 Oxford Road	13,721	40.3 (20.0)	6.2
St Georges Road	558	20	0
Groveland Road (using Waverley Road as a proxy)	1,592	20	0.8

Note: This is a non-exhaustive summary of the road sections modelled and includes the sections that are likely to contribute the greatest emissions to the development receptors.

Table 4.2 identifies the estimated 2023 AADT traffic flows for roads near to the proposed development (for use in the constraints modelling and impact assessment).

The proposed development will generate minimal additional traffic onto the local road network as it will include limited parking provision.

The data were then scaled to the earliest expected occupation year of the proposed development, 2023, using a final growth factor of 1.0509 obtained from TEMPro and English Regional Traffic Growth and Speed Forecasts (RTF). Vehicle speeds were based on speed estimations and were subsequently adjusted where it was deemed, they were not sufficiently accurate, e.g. at junctions, crossings, etc.

Table 4.2: 2023 Opening Year Traffic Flow Data

Monitoring Site Road Section	AADT (without development)	AADT (with development)	Speed (km/h)	HDV%
A329 Oxford Road	14,419	14,569	40.3 (20.0)	6.2
St Georges Road**	586	586	20	0
Groveland Road (using Waverley Road as a proxy)**	1,673	1,673	20	0.8

Note: This is a non-exhaustive summary of the road sections modelled and includes the sections that are likely to contribute the greatest emissions to the development receptors.

*this is the speed limit for the roads and have been reduced appropriately at junctions, etc.

**assume no development traffic along these links

4.9. Validation and Verification of the Model

Model validation undertaken by the software developer will not have been carried out in the vicinity of the site being considered in this assessment. As a result, it is necessary to perform a comparison of the modelled results with local monitoring data at suitable locations. This verification process aims to minimise model uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results. The verification was carried out in accordance with LAQM.TG16. Suitable monitoring data for the purpose of verification is available for concentrations of NO₂ at the monitoring positions detailed in **Section 3.3**.

When the monitored and modelled results are compared as recommended in LAQM.TG16 the road NO_x adjustment factor is **5.419** (as identified in **Table 4.3**). This factor was applied to all modelled NO_x results prior to calculating modelled NO₂ using the NO_x to NO₂ calculator. In the absence of appropriate PM₁₀ monitoring within close proximity to the site, the NO_x adjustment factor has also been applied to the PM₁₀ modelled concentrations, in accordance with the guidance provided in LAQM.TG16.

Table 4.3: NO₂ Annual Mean Verification for 2019

Monitoring Position	Monitored		Modelled		% Difference (NO _x Roads) Before Adjustment	% Difference (NO ₂ Total) After Adjustment	Adjustment Factor (Regression) for Modelled Road Contribution
	Road NO ₂ µg/m ³	Road NO _x ¹⁶ µg/m ³	Road NO ₂ µg/m ³	Road NO _x µg/m ³			
RD3 Oxford Road	9.6	18.6	2.6	4.9	-73.4%	15.4%	5.419
689 Oxford Road	21.1	42.6	4.1	7.6	-82.1%	-1.5%	
744 Oxford Road	25.1	51.6	4.7	8.9	-82.8%	-3.9%	

¹⁶ Obtained from NO_x to NO₂ Calculator Spreadsheet available from www.laqm.Defra.gov.uk

5. IMPACTS AND CONSTRAINTS OF AIR QUALITY

5.1. Construction Phase Assessment

5.1.1. Dust and PM₁₀ Arising from On-Site Activities

Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀ include:

- Site clearance and preparation including potential demolition activities;
- Preparation of temporary access/egress to the Application Site and haulage routes;
- Materials handling, storage, spillage and disposal;
- Movement of vehicles and construction traffic within the Site;
- Use of crushing and screening equipment/plant;
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction alongside fabrication processes; and
- Internal and external finishing and refurbishment.

The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

5.1.2. Assessment of Potential Dust Emission Magnitude

The IAQM assessment methodology¹⁷ has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

The total volume of buildings to be demolished on site is assumed to be minimal (substantially less than 20,000m³) and construction material is expected to have a low potential for dust release (e.g. metal cladding or timber). Therefore, the potential dust emission magnitude is considered to be **small** for demolition activities.

Earthworks

The total site area is <2,500 m² and it is expected that less than 5 heavy earth moving vehicles will be active at any one time and less than 20,000 tonnes of material will be moved. Therefore, the potential dust emission magnitude is considered to be **small** for earthwork activities.

Construction

The total volume of building to be constructed on the Application Site will be substantially less than 25,000m³ with material with a low potential for dust release being used. Therefore, the potential dust emission magnitude is considered to be **small** for construction activities.

¹⁷ Institute of Air Quality Management (2016). Guidance on the assessment of dust from demolition and construction.

Trackout

Information on the number of HDV associated with this phase of the proposed development is not available and therefore professional judgement has been used. It has been assumed that given the size of the development there are likely to be less than 10 HDV outward movements in any one day. Therefore, the potential dust emission magnitude is considered to be **small** for construction activities.

A summary of the potential dust emission magnitude determined for each construction activity is presented in **Table 5.1**.

Table 5.1: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction Activities	Small
Trackout	Small

5.1.3. Assessment of Sensitivity of the Study Area

The prevailing wind direction is from the south and southwest. Therefore, receptors located to the north and north-east of the proposed development are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase. The land to the north and north-east of the proposed development is occupied by residential properties.

Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. The closest highly sensitive receptors to the proposed development are the apartment buildings located adjacent to the Site (61-80 Winslet Place). These receptors are situated within 20m of the site boundary.

Taking the above into account and following the IAQM assessment methodology¹⁷, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 5.8**.

Table 5.2: Sensitivity of the Study Area

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

Risk of Impacts

The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 5.3** below provides a summary of the risk of dust impacts for the Proposed Development.

The risk category identified for each construction activity has been used to determine the level of mitigation required.

Overall, there is a **medium** to **low risk** of dust impacts relating to the expected construction phase activities, prior to mitigation being applied.

Table 5.3: Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition (small)	Earthworks (small)	Construction (small)	Trackout (small)
Dust Soiling (high)	Medium Risk	Low Risk	Low Risk	Low Risk
Human Health (low)	Negligible	Negligible	Negligible	Negligible

5.1.4. Construction Vehicles & Plant

The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via Oxford Road. Due to the size of the proposed development and nature of construction works; construction traffic volumes will be low within the context of existing traffic flows on this road.

Existing background levels of relevant pollutants (NO₂, PM₁₀ and PM_{2.5}, see **Section 3.3**) are predicted to be significantly below the respective annual mean Air Quality Objectives.

Therefore, based on the available information and professional judgement, the local air quality impact associated with emissions from construction vehicles and plant are expected to be **negligible**.

5.2. Operational Impact Assessment

5.2.1. Impacts of Operational Phase Traffic Emissions on Local Air Quality

The proposed development will provide up to 25 residential units with up to 25 parking spaces. The proposed development is not expected to contribute to anything other than a very small increase of approximately 1% in the number of vehicles trips on to the local road network. However, as the development has more than 10 residential units, there is the requirement to assess the impact of the development on the local area.

Table 5.7, Table 5.5 and Table 5.6 identify the modelled NO₂ and PM₁₀/PM_{2.5} concentrations at existing receptors in 2023.

Table 5.4: Modelled 2023 Total NO₂ Concentrations – Existing Receptors

Receptor	Air Quality Objective (µg/m ³)	2023 Without Development (µg/m ³)	2023 With Development (µg/m ³)	Change %
ER1	40	23.1	23.1	0%
ER2		22.0	22.1	0%
ER3		21.8	21.8	0%
ER4		23.7	23.9	0%
ER5		24.7	24.8	0%

Table 5.5: Modelled 2023 Total PM₁₀ Concentrations – Existing Receptors

Receptor	Air Quality Objective (µg/m ³)	2023 Without Development (µg/m ³) (Days Exceedance)	2023 With Development (µg/m ³) (Days Exceedance)	Change %
ER1	40	16.8 (1)	16.9 (1)	0%
ER2		16.5 (1)	16.6 (1)	0%
ER3		16.5 (0)	16.5 (0)	0%
ER4		18.3 (2)	18.3 (2)	0%
ER5		18.5 (2)	18.6 (2)	0%

Table 5.6: Modelled 2023 Total PM_{2.5} Concentrations – Existing Receptors

Receptor	Air Quality Objective (µg/m ³)	2023 Without Development (µg/m ³)	2023 With Development (µg/m ³)	Change %
ER1	25	11.4	11.4	0%
ER2		11.2	11.2	0%
ER3		11.2	11.2	0%
ER4		12.5	12.5	0%
ER5		12.6	12.6	0%

Based on the assessment results, exceedances of the annual mean NO₂ and PM₁₀ objective is unlikely both without and with the development. Pollutant concentrations are not anticipated to exceed the AQS objective for annual mean NO₂ and PM₁₀. In addition, predicted concentrations of PM_{2.5} are also unlikely to exceed the indicative 25µg/m³ threshold.

The annual mean NO₂ concentrations predicted by the model are all significantly below 60µg/m³, and therefore exceedances of the hourly mean NO₂ concentration objective are unlikely to occur.

The objective for 24 hourly mean PM₁₀ concentrations is 50µg/m₃ to be exceeded no more than 35 times a year. The results of the dispersion modelling indicate that this objective will be met at all receptor locations considered as there are no predicted days of exceedance. The change in pollutant concentrations is also predicted to be negligible.

It is considered that the effect of the proposed development on NO₂, PM₁₀ and PM_{2.5} concentrations would be not significant as the proposed development is not predicted to lead to any new objective exceedances or the designation, or extension, of an AQMA.

5.3. Predicted Air Quality Constraints on the Development

As identified in **Table 2.2**, the AQS objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objectives. On the basis that the proposed development consists of residential dwellings on ground floor and above the annual mean objective is to be assessed to determine whether mitigation measures are required to mitigate against poor air quality.

5.3.1. Sensitive Receptors Identification

In order to characterise the air quality at the proposed development, predictions of air pollutant concentrations have been carried out for the occupation year of 2023 using the ADMS Roads dispersion model and UK emission factors. Development receptors were modelled at the ground floors of the proposed development as identified in **Appendix 4**. Higher floors were not modelled as the general trend for pollutant concentrations is to reduce with increasing height, therefore it was only deemed necessary to model pollutant concentrations at the ground floor which is a worst-case scenario.

5.3.2. Exposure of Future Residents to Poor Air Quality

Development of the Site for residential use will introduce new sensitive receptors into the local area. As noted in the baseline section, the Site lies within an existing AQMA, therefore air quality concentrations may be above the air quality objectives due to the location of the Site.

Following the guidance provided within the DMRB¹⁸ locations sensitive to road traffic emissions within 200m of the highway network are likely to be within the limits of pollutant dispersion from road sources.

The annual mean NO₂, PM₁₀ and PM_{2.5} concentrations at the façade of the proposed development were calculated using dispersion modelling for an opening year of 2023.

Table 5.7 and **Table 5.8** identifies the modelled NO₂ and PM₁₀/PM_{2.5} concentrations at development receptors in 2023 (modelled at ground floor level). At the development site, the annual mean pollutant concentrations are predicted to be significantly below the AQO.

¹⁸ DMRB Volume 11, Section 3, Part 1, LA 105, Highways England, 2019.

Table 5.7: Modelled 2023 NO₂ Concentrations – Development Receptors

Receptor	Air Quality Objective (µg/m ³)	NO ₂ Road Contribution (µg/m ³)	Total NO ₂ (µg/m ³)
DR1	40	7.5	22.1
DR2		8.3	22.9
DR3		7.5	22.0
DR4		2.5	17.1

Table 5.8: Modelled 2023 PM₁₀ and PM_{2.5} Concentrations – Development Receptors

Receptor	PM ₁₀ Air Quality Objective (µg/m ³)	Total PM ₁₀ µg/m ³ (Days >50 µg/m ³) ²⁰	PM _{2.5} Air Quality Objective (µg/m ³)	Total PM _{2.5} µg/m ³
DR1	40	16.6 (1)	25	11.2
DR2		16.8 (1)		11.3
DR3		16.5 (1)		11.2
DR4		15.1 (0)		10.4

Based on the assessment results, future occupant exposure to exceedances of the annual mean NO₂ and PM₁₀ objective is very unlikely at the proposed development. Pollutant concentrations are not anticipated to exceed the AQS objective for annual mean NO₂ and PM₁₀. In addition, predicted concentrations of PM_{2.5} are also unlikely to exceed the indicative 25µg/m³ threshold.

The annual mean NO₂ concentrations predicted by the model were all well below 60µg/m³, and therefore exceedances of the hourly mean NO₂ concentration objective are unlikely to occur within the Proposed Development.

The objective for 24 hourly mean PM₁₀ concentrations is 50µg/m³ to be exceeded no more than 35 times a year. The results of the dispersion modelling indicate that this air quality objective will be met at all receptor locations considered within the proposed development as there are no predicted days of exceedance.

6. MITIGATION

6.1. Construction Phase

Based on the construction phase air quality assessment results, there is a medium to low risk of dust impacts occurring at identified sensitive receptors throughout the construction phase. Accordingly, a range of environmental management controls would be developed to minimise dust nuisance with reference to the IAQM guidance for medium-risk sites. The management controls would prevent the release of dust entering the atmosphere and/or being deposited on nearby receptors.

The following recommended mitigation measures are typical for a development of this nature:

Stakeholder Engagement

- A stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented.
- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

General Dust Management

- A Dust Management Plan (DMP), which may include measures to control other emissions, in addition to the dust and PM₁₀ mitigation measures given in this report, should be developed and implemented, and approved by the Local Authority.

Site inspections

- The developer Applicant and contractor are to actively monitor the site to ensure the control of dust and emissions.

Site Management

- All dust and air quality complaints should be recorded, and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the local authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on or offsite should be recorded, and then the action taken to resolve the situation recorded in the log book.

Monitoring

- Regular site inspections to monitor compliance with the DMP should be carried out, inspection results recorded, and an inspection log made available to the local authority when asked.
- The frequency of site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and maintaining the site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.

- Where practicable, erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Where practicable, fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicle operators 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.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes 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.

Waste management

- No bonfires and burning of waste materials.
- Any excess material should be reused or recycled on or off-site in accordance with appropriate legislation.

Measures Specific to Demolition

- 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 Earthworks

- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.

- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

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 in frequent use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

The residual effects of dust and PM₁₀ generated by construction activities following the application of the appropriate site mitigation measures described above, combined with good site practice, are expected to be **not significant**.

The residual effects of emissions to air from construction vehicles and plant on local air quality is expected to be **not significant**.

6.2. Operation Phase

As identified by the assessment, there will be no exceedances of the NAQO's for NO₂, PM₁₀ and PM_{2.5} at any of the proposed development receptors for the projected earliest occupation year of 2023. All predicted concentrations are significantly below the annual mean NO₂ and PM₁₀ objective values of 40µg/m³.

The assessment has shown that air quality for future residents will be acceptable across the proposed development site; no specific mitigation measures are therefore deemed necessary for future residents. Therefore, the effect of the proposed development on local air quality is expected to be **not significant**.

7. CONCLUSIONS

The proposals have the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the site during operation, as well as the exposure of future occupants to any existing air quality issues. As such, an air quality assessment was required in order to determine baseline conditions and assess potential effects as a result of the scheme.

This report presents the outcomes of an air quality impact assessment for the proposed residential development off Oxford Road, Reading. The assessment has considered potential local air quality impacts associated with both the construction phase and operational phase of the proposed development.

During the construction phase of the proposed development there is the potential for air quality impacts because of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by demolition, earthworks, construction and trackout activities was predicted to be **not significant**.

The proposed development is a small-scale development and the trip generations are considered to be minimal. It is considered that the effect of the development on NO₂, PM₁₀ and PM_{2.5} concentrations would be not significant as the development is not predicted to lead to any new objective exceedances or the designation, or extension, of an AQMA.

The proposed development has the potential to expose future users to elevated pollution levels in the vicinity of the site during operation. Dispersion modelling was therefore undertaken using ADMS-Roads to predict pollutant concentrations because of emissions from the local highway network. Results were verified using local monitoring data. Model results indicates that future users are very unlikely to be exposed to pollutant concentrations (NO₂ and PM₁₀) that exceed the air quality objectives. As such the site would not require any additional mitigation measures.

Based on the assessment results, air quality factors are not considered to be a constraint to planning consent for the development.

APPENDICES

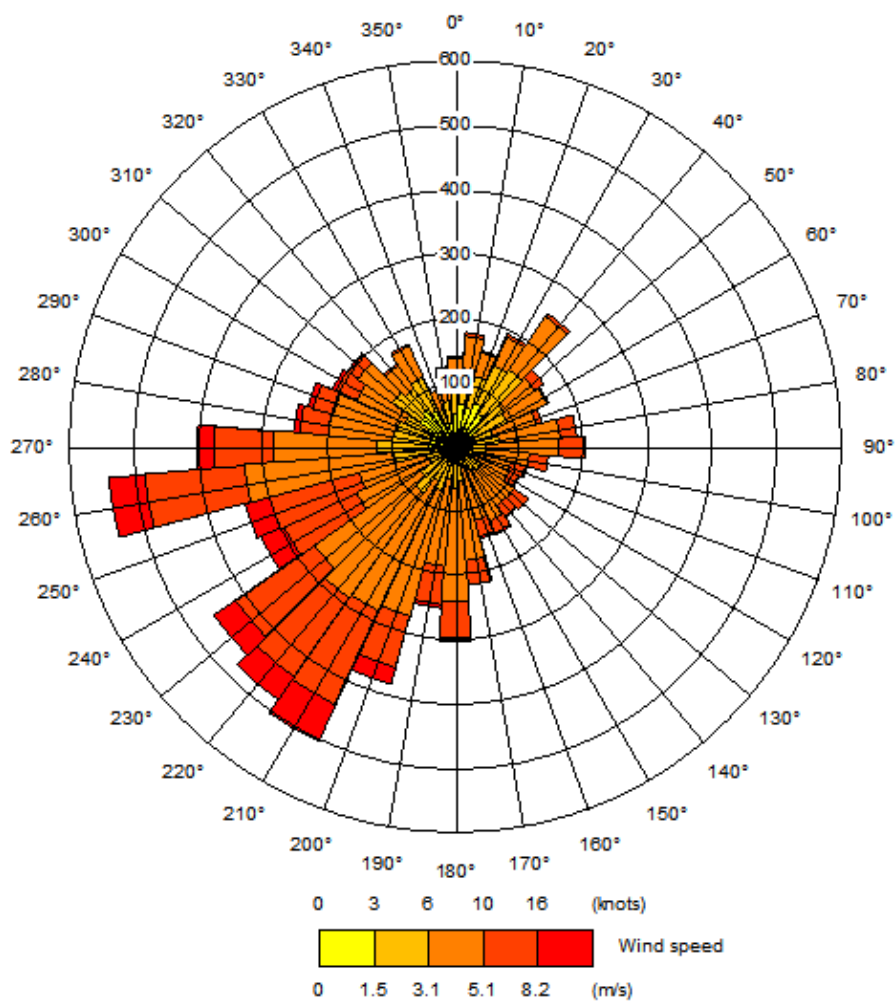
Appendix 1: Glossary of Terms

AADT	Annual Average Daily Traffic
AAHT	Annual Average Hourly Traffic
AQMA	Air Quality Management Area -An area that a local authority has designated for action, based upon predicted exceedances of Air Quality Objectives.
AQS/ NAQOs	Air Quality Standard/ National Air Quality Objectives - The concentrations of pollutants in the atmosphere, which can broadly be taken to achieve a certain level of environmental quality. The standards are based on assessment of the effects of each pollutant on human health including the effects on sensitive sub groups.
AURN	Automatic Urban and Rural Network Air Quality Monitoring Site.
Calendar Year	The average of the concentrations measured for each pollutant for one year. In the case of the AQS this is for a calendar year.
Concentration	The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant per unit volume of air (for example, micrograms per cubic metre, $\mu\text{g}/\text{m}^3$) or a volume of gaseous pollutant per unit volume of air (parts per million, ppm).
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emissions Factor Toolkit
Exceedance	A period of time where the concentration of a pollutant is greater than the appropriate Air Quality Objective.
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
LAQM	Local Air Quality Management
Nitrogen Oxides	Nitric oxide (NO) is mainly derived from road transport emissions and other combustion processes such as the electricity supply industry. NO is not considered to be harmful to health. However, once released to the atmosphere, NO is usually very rapidly oxidised to nitrogen dioxide (NO ₂), which is harmful to health. NO ₂ and NO are both oxides of nitrogen and together are referred to as nitrogen oxides (NO _x).
PM₁₀/PM_{2.5}	Fine Particles are composed of a wide range of materials arising from a variety of sources including combustion sources (mainly road traffic), and coarse particles, suspended soils and dust from construction work. Particles are measured in a number of different size fractions according to their mean aerodynamic diameter. Most monitoring is currently focused on PM ₁₀ (less than 10 microns in aero-dynamic diameter), but the finer fractions such as PM _{2.5} (less than 2.5 microns in aero-dynamic diameter) is becoming of increasing interest in terms of health effects.
TEMPro	TEMPro is software produced by the DfT to calculate the expected growth of traffic by year on roads throughout the country. The factor varies depending on the region and type of road.
$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre of air - A measure of concentration in terms of mass per unit volume. A concentration of $1\mu\text{g}/\text{m}^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollution.

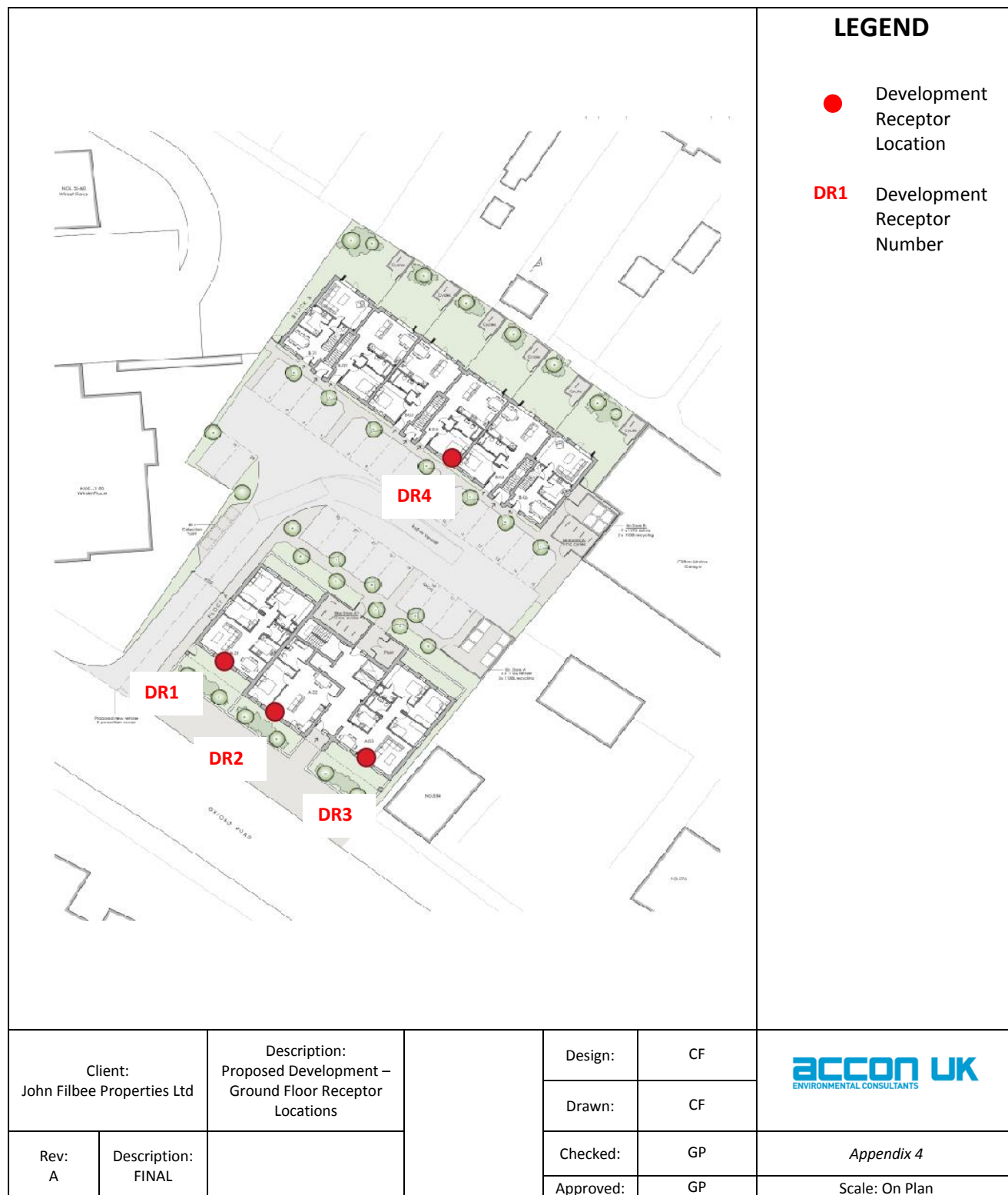
Appendix 2: Air Quality Standards

Pollutant	Averaging Period	Limit Value	Margin of Tolerance
Benzene	Calendar Year	5µg/m ³	
Carbon Monoxide	Maximum daily running 8 Hour Mean	10mg/m ³	
Lead	Calendar Year	0.5µg/m ³	100%
Nitrogen Dioxide	One Hour	200µg/m ³ Not to be exceeded more than 18 times per year	
	Calendar Year	40µg/m ³	
Particulates (PM₁₀)	One day	50µg/m ³ Not to be exceeded more than 35 times per year	50%
	Calendar Year	40µg/m ³	20%
Particulates (PM_{2.5})	Calendar Year	25µg/m ³	20%
Sulphur Dioxide	One Hour	350µg/m ³ Not to be exceeded more than 24 times per calendar year	150µg/m ³
	One Day	150µg/m ³ Not to be exceeded more than 3 times per calendar year	

Appendix 3: 2019 Heathrow Airport Wind Rose



Appendix 4: Proposed Development – Ground Floor Receptor Locations



Email: enquiry@acon-uk.com

Reading Office:

Unit B, Fronds Park,
Frouds Lane, Aldermaston,
Reading, RG7 4LH
Tel: 0118 971 0000 Fax: 0118 971 2272

Brighton Office:

Citibase, 95 Ditchling Road,
Brighton, East Sussex, BN1 4ST
Tel: 01273 573 814

www.acon-uk.com

acon UK
ENVIRONMENTAL CONSULTANTS