

ENVIRONMENT

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Palatine Road & Brett Street
Northenden, Manchester
Air Quality Assessment

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EXECUTIVE SUMMARY

BWB Consulting Limited was appointed by Express Solicitors to undertake an air quality assessment for a proposed mixed-use development at land off Palatine Road and Brett Street in Northenden, Manchester.

The proposed development is located within the administrative area of Manchester City Council. The Site is not located within an existing Air Quality Management Area. However, sections of the Greater Manchester Combined Authority Air Quality Management Area are located approximately 140m south west and 190m north east of the Site. The Air Quality Management Area was declared for the potential exceedance of the current annual mean nitrogen dioxide objective.

A qualitative construction phase dust assessment was undertaken in accordance with Institute of Air Quality Management guidance and measures were recommended to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions was considered to be 'not significant' in accordance with Institute of Air Quality Management guidance.

The proposed development trip generation was screened using the Institute of Air Quality Management and Environmental Protection UK two stage screening process, to determine whether a detailed road traffic emissions impact assessment was required. The proposed development trip generation did not exceed the relevant screening criteria for development both outside and within an Air Quality Management Area. Therefore, a detailed impact assessment was not required and the impact of the proposed development on local air quality was considered to be not significant.

A detailed road traffic emissions exposure assessment was undertaken to consider the suitability of the Site for the proposed partial residential use. Concentrations of nitrogen dioxide and particulate matter (PM₁₀ and PM_{2.5}) were predicted across the Site and compared to the current air quality objectives for England. The modelling assessment was undertaken in accordance with Defra Local Air Quality Technical Guidance and Institute of Air Quality Management & Environmental Protection UK guidance. Pollutant concentrations were predicted to be below the current relevant air quality objectives for England and the Site was considered suitable for the proposed use. No mitigation measures were therefore required to minimise the exposure of future occupants of the Site to elevated pollutant concentrations. However, measures proposed as part of the development which may be beneficial to local air quality include a Travel Plan and Electric Vehicle Charging Points for each car parking space included within the development proposals.

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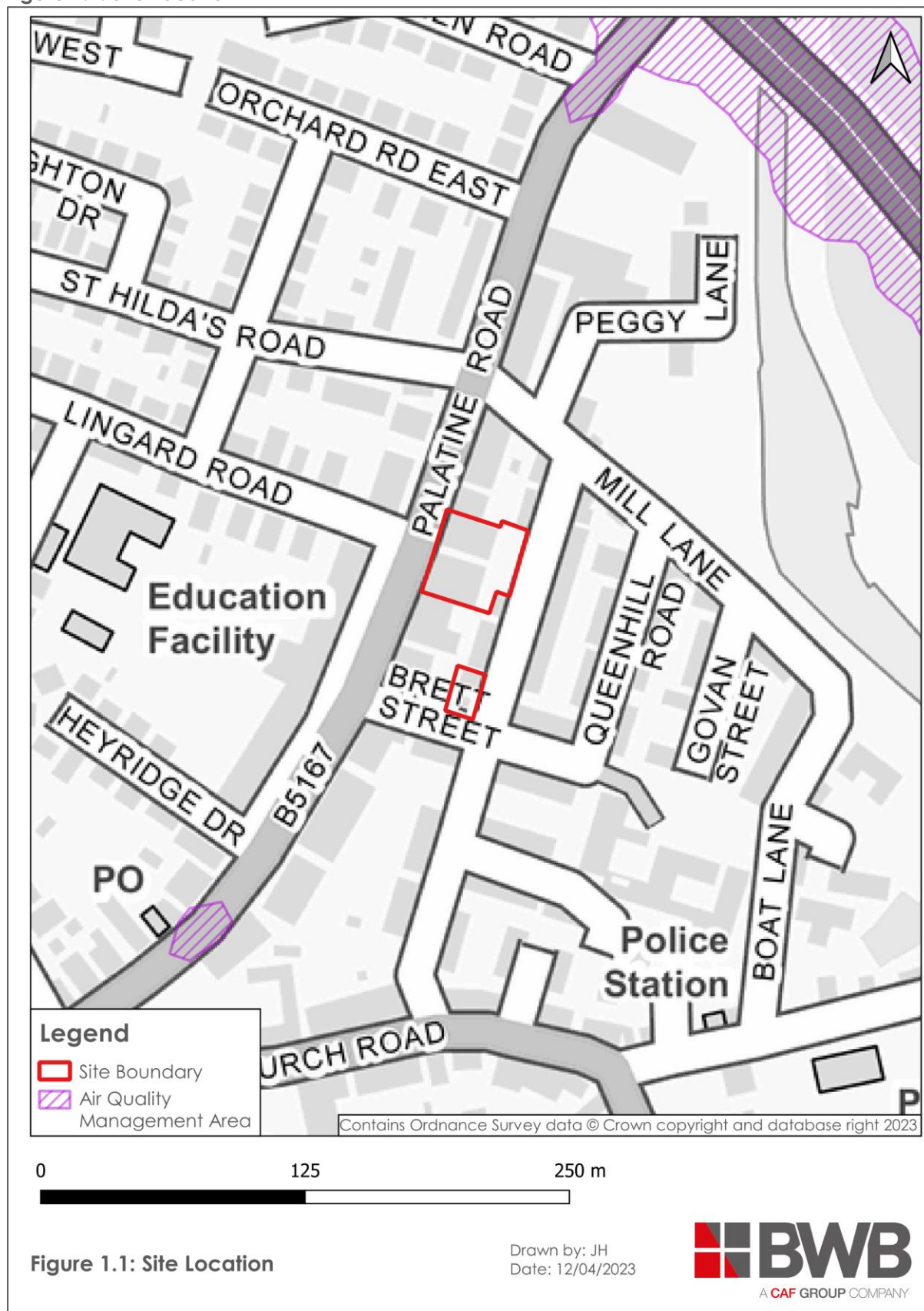
1. INTRODUCTION

- 1.1 BWB Consulting Limited (BWB) was instructed by Express Solicitors (the Client) to undertake an air quality assessment for a proposed mixed-use development at land off Palatine Road and Brett Street in Northenden, Manchester ('the Site').
- 1.2 The assessment considers construction phase dust impacts and operational phase road traffic emissions. A qualitative construction phase dust assessment was undertaken in accordance with relevant guidance. An operational phase road traffic emissions screening assessment was undertaken to consider the requirement for a detailed assessment of additional vehicles generated by the proposed development. In addition, an exposure assessment was undertaken in which pollutant concentrations were predicted across the Site to determine the suitability of the Site for the proposed residential use.
- 1.3 This report is necessarily technical in nature so to assist the reader a glossary of air quality terminology can be found in **Appendix A**.

Site Setting

- 1.4 The proposed development comprises two parcels of land located in close proximity; one parcel of land is located off Palatine Road and the other off Brett Street. The proposed development is located within the administrative area of Manchester City Council (MCC).
- 1.5 **Figure 1.1** details the location of the proposed development. The Site currently comprises three buildings occupied for commercial/retail, office and residential use.
- 1.6 The Site is located within an existing mixed-use area, with residential dwellings located to the north, east and south and commercial uses to the west of the Site along Palatine Road.
- 1.7 Principal air pollution sources in the vicinity of the Site are likely to comprise road traffic emissions. The Site is not located within an existing Air Quality Management Area (AQMA). However, sections of the Greater Manchester Combined Authority (GMCA) AQMA are located approximately 140m south west and 190m north east of the Site and were declared for the potential exceedance of the current annual mean nitrogen dioxide (NO₂) objective.
- 1.8 The proposed development comprises two single aspect mews houses fronted off Brett Street, three additional single aspect mews houses presenting a residential edge onto Allanson Road, and a four-storey new-build mixed-use development fronting Palatine Road, comprising a retail/commercial base at ground floor level and with a mix of one- and two-bedroom apartments on the upper floor levels. The proposed development masterplan is detailed in **Appendix B**.

Figure 1.1: Site Location



2. LEGISLATION, PLANNING POLICY & GUIDANCE

National Legislation and Planning Policy

2.1 The following national legislation and planning policy is relevant to air quality and was considered in the undertaking of the assessment. A summary of the relevant national legislation and planning policy is provided in **Appendix C**:

- European Parliament, EU 2008 ambient Air Quality Directive (2008)¹;
- HMSO, Air Quality (England) Regulations (2000)²;
- HMSO, Environment Act (1995)³;
- HMSO, Environment Act (2021)⁴;
- HMSO, Air Quality (England) Regulations (2002)⁵;
- HMSO, Air Quality Standards Regulations (2010)⁶;
- Department for Environment, Air Quality Strategy (1997)⁷;
- Department for the Environment, Food and Rural Affairs, Air Quality Strategy (2007)⁸;
- Department for the Environment, Food and Rural Affairs, Air Quality Strategy (2023)⁹;
- Department for the Environment, Food and Rural Affairs, The Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020)¹⁰;
- HMSO, The Environmental Targets (Fine Particulate Matter) (England) Regulations (2023)¹¹;
- Ministry of Housing, Communities and Local Government, National Planning Policy Framework (NPPF) (2021)¹²; and
- Ministry for Housing, Communities and Local Government, Planning Practice Guidance (PPG) for air quality (2019)¹³.

Local Planning Policy

2.2 The following local planning policy was considered in the undertaking of the assessment and a summary is provided in **Appendix C**:

- Manchester City Council, Manchester's Local Development Framework: Core Strategy Development Plan Document (2012)¹⁴.

¹ European Parliament (2008) Council Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe

² HMSO (2000) Statutory Instrument 2000 No. 928, The Air Quality (England) Regulations 2000 (as amended), London: HMSO

³ HMSO (1995) The Environment Act 1995, London: TSO

⁴ HMSO (2021) The Environment Act 2021, London: TSO

⁵ HMSO (2002) Statutory Instruments 2002 No. 3043, The Air Quality (England) (Amendment) Regulations 2002, London: HMSO

⁶ HMSO (2010) Statutory Instruments 2010 No. 1001 Air Quality Standards Regulations 2010. London: HMSO

⁷ Department of the Environment (DoE) (1997) The UK National Air Quality Strategy, London: HMSO

⁸ Department of the Environment, Food and Rural Affairs (Defra) (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, London: HMSO

⁹ Department of the Environment, Food and Rural Affairs (Defra) (2023) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, London: HMSO

¹⁰ Department of the Environment, Food and Rural Affairs (Defra) (2020) The Environment (Miscellaneous Amendments) (EU Exit) Regulations, London: HMSO

¹¹ HMSO (2023) Statutory Instruments 2023 No. 96 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

¹² Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework, HMSO London

¹³ Ministry for Housing, Communities and Local Government (2019) Planning Practice Guidance Air Quality

¹⁴ Manchester City Council (2012) Manchester's Local Development Framework: Core Strategy Development Plan Document

Air Quality Assessment Guidance

2.3 The following guidance was utilised in the air quality assessment:

- Defra, Local Air Quality Management Technical Guidance (LAQM.TG (22)) (2022)¹⁵;
- Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction (2023)¹⁶;
- Institute of Air Quality Management and Environmental Protection UK, Land-Use Planning and Development Control: Planning for Air Quality (2017)¹⁷; and
- Manchester City Council, Air Quality & Planning Technical Guidance (2022)¹⁸.

¹⁵ Defra (2022) Local Air Quality Management Technical Guidance LAQM.TG (22)

¹⁶ Institute of Air Quality Management (2023) Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London

¹⁷ Institute of Air Quality Management and Environmental Protection UK (2017) Land-Use Planning and Development Control: Planning for Air Quality

¹⁸ Manchester City Council (2022) Air Quality & Planning Technical Guidance

3. METHODOLOGY

Consultation with Manchester City Council

3.1 Consultation was undertaken with the Environmental Health and Protection Department at MCC in which the proposed assessment methodology was provided via email on the 14th August 2023. A response was received on the 17th August 2023 confirming acceptance of the proposed methodology.

3.2 The agreed methodology is detailed below:

- Construction Phase - A construction phase dust assessment was undertaken and relevant measures to mitigate construction phase dust emissions were recommended. The assessment was undertaken in accordance with guidance provided by the Institute of Air Quality Management (IAQM)¹⁶.
- Operational Phase – An operational phase road traffic emissions screening assessment was undertaken in accordance with IAQM and Environmental Protection UK (EPUK) guidance¹⁷.
- Operational Phase Road Traffic Emissions Exposure Assessment – Detailed dispersion modelling was undertaken to predict pollutant concentrations at the Site to consider the Site suitability for the proposed partial residential end use. The dispersion model ADMS-Roads was used to model concentrations of oxides of nitrogen (NO_x) and particulate matter (PM₁₀ and PM_{2.5}) across the Site. The assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance (LAQM.TG22)¹⁵.
- Consideration was also given to the MCC Air Quality & Planning Technical Guidance¹⁸. The proposed development was classified as 'major' in accordance with the Town & Country Planning Act as the proposals comprise 10 or more residential units. However, the predicted trip generation does not exceed the screening criteria detailed within the IAQM/EPUK guidance¹⁵ and the proposed development does not introduce any additional trips onto the road network. Furthermore, the predicted trip generation for the proposed development is a reduction of the existing trip generation of the Site's current use. As such, there was no requirement to offset any emissions and a damage cost calculation was not undertaken for the proposed development.

3.3 Full details of the methodology used in the assessment, as agreed with MCC, are provided below.

Construction Phase Dust Assessment

3.4 An assessment of the potential impacts arising from the construction of the proposed development was undertaken in accordance with IAQM guidance¹⁷. The full assessment methodology is not reproduced within this report but a summary of the assessment steps are provided below:

- Step 1 – screen the requirement for a more detailed assessment. No assessment is required if there are no receptors within a certain distance of the works.
- Step 2 – assess the risk of dust impacts separately for each of the four activities considered (demolition, earthworks, construction and trackout).

- Step 2A – determine the potential dust emission magnitude for each of the four activities;
 - Step 2B – determine the sensitivity of the area;
 - Step 2C – determine the risk of dust impacts by combining the findings of steps 2A and 2B.
- Step 3 – determine the site-specific mitigation for each of the four activities; and
- Step 4 – examine the residual effects and determine significance.

Operational Phase Road Traffic Emissions – Screening Assessment

IAQM and EPUK

- 3.5 Guidance published by the IAQM and EPUK in 2017¹⁷ provides a two-stage approach to determine the level of assessment required in the consideration of the impact of development-generated road traffic emissions on local air quality.

Stage 1

- 3.6 The Stage 1 criteria requires that the assessment progress to Stage 2 if any of the following apply:
- The development comprises:
 - 10 or more residential units or a site area of more than 0.5ha; or
 - More than 1,000m² of floor space for all other uses or a site area greater than 1ha;
 - Coupled with any of the following:
 - The development has more than 10 parking spaces; or
 - The development will have a centralised energy facility or other centralised combustion process.

Note: Consideration should be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

Stage 2

- 3.7 The IAQM and EPUK guidance¹⁷ provides the following indicative criteria to determine whether a detailed road traffic emissions assessment is required for a proposed development.
- 3.8 The Stage 2 criteria relevant to the proposed development are:
- A change in Light Duty Vehicles (LDV) flow of more than 500 vehicles as a 24 hour Annual Average Daily Traffic (AADT) flow outside an AQMA, or a change of LDV flow of more than 100 vehicles as a 24 hour AADT flow within an AQMA; and
 - A change in Heavy Duty Vehicles (HDV) flow of more than 100 vehicles as a 24 hour AADT flow outside an AQMA, or a change of HDV flow of more than 25 vehicles as a 24 hour AADT flow within an AQMA.

Manchester City Council Air Quality & Planning Technical Guidance

- 3.9 Consideration given to the MCC Air Quality & Planning Technical Guidance¹⁸. The proposed development was classified as 'major' in accordance with the Town & Country Planning Act as the proposals comprise 10 or more residential units. However, the predicted trip generation does not exceed the screening criteria detailed within the IAQM/EPUK guidance¹⁵ and the proposed development does not introduce any additional trips onto the road network. Furthermore, the predicted trip generation for the proposed development is a reduction of the existing trip generation of the Site's current use. As such, there was no requirement to offset any emissions and a damage cost calculation was not undertaken for the proposed development. This approach was agreed with the Environmental Health and Protection Department at MCC. The MCC Air Quality & Planning Technical Guidance¹⁸ was therefore not considered further in the assessment.

Operational Phase Road Traffic Emissions – Site Suitability Assessment

Air Dispersion Modelling

- 3.10 The air dispersion model ADMS-Roads, version 5.0.1.3 was utilised in the assessment to predict concentrations of NO_x, PM₁₀ and PM_{2.5} across the Site to consider the Site suitability for the proposed partial residential use.
- 3.11 The assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance¹⁵ and IAQM and EPUK guidance¹⁷.

Assessment Scenarios and Traffic Data

- 3.12 The following scenarios were considered in the air dispersion modelling:
- Scenario 1: 2019 Verification Year; and
 - Scenario 2: 2025 Opening Year with development.
- 3.13 Traffic data were obtained from Prime Transport Consulting, the Transport Consultants for the project. 24-hour AADT flows and HDV proportions were provided for the following roads for use in the assessment:
- M60 motorway;
 - A5103 Princess Parkway;
 - B5167 Palatine Road; and
 - B5167 Wythenshawe Road.
- 3.14 Consideration was given to the speeds at which vehicles are likely to travel within the study area. Free flowing traffic conditions were modelled at speed limits. Queuing sections were modelled in accordance with Defra guidance¹⁴.
- 3.15 Traffic data used in the air dispersion modelling are provided in **Appendix C**.

ADMS-Roads Model Inputs

3.16 The following model inputs were utilised in the assessment:

- Emission Factors – emission factors were utilised from the Defra Emission Factor Toolkit¹⁹ (EFT), version 11, for the years of assessment (2019 and 2025).
- Conversion of oxides of nitrogen – concentrations of NO_x were predicted using the ADMS-Roads dispersion model. These concentrations were converted to nitrogen dioxide (NO₂) using the Defra NO_x to NO₂ calculator²⁰, version 8.1.
- Meteorological Data – hourly sequential meteorological data for the verification year of assessment (2019) were obtained for the Manchester Airport recording station. This is the closest meteorological station to the Site. The wind rose for 2019 is provided in **Appendix E**.
- Surface roughness and Monin-Obukhov length (MO) – Site - A surface roughness of 1m and a Monin-Obukhov length of 30m was utilised for the Site which is considered to best represent the location of the Site within the outlying suburban area of Northenden, which is also located within the wider Manchester conurbation.
- Surface roughness and Monin-Obukhov length (MO) – Meteorological Station - A surface roughness of 0.0095m and a Monin-Obukhov length 26.3m was utilised for the Manchester Airport recording station, which are the meteorological parameters contained within the meteorological file for the recording station.
- Background pollutant concentrations – background concentrations of NO₂, PM₁₀ and PM_{2.5} for the study area were obtained from pollutant concentration maps²¹ provided by Defra as a 1km x 1km grid of the UK, for the years of assessment (2019 and 2025).
- Model verification – model verification was undertaken using 2019 monitoring data available for the study area. Full details of the verification procedure are provided in **Appendix E**.
- Calculation of short term PM₁₀ concentrations – the following calculation, as detailed in Defra guidance¹⁶, was utilised to calculate the number of exceedances of the 24-hour mean PM₁₀ air quality objective:

$$\text{Number of 24-Hour Mean Exceedance} = -18.5 + 0.00145 * \text{Annual Mean}^3 + (206 / \text{Annual Mean})$$

- The IAQM released a position statement²² in July 2018 regarding dealing with the uncertainty in vehicle NO_x emissions within air quality assessments. This recommends that sensitivity analyses be undertaken, and professional judgement be applied to consider the scenario where NO_x emissions do not reduce as rapidly as shown by the EFT. The IAQM position statement was withdrawn in July 2021 following extensive research which identified that Emission Factor Toolkits v8.1 and onwards were considered to more accurately represent real world NO_x emissions. No sensitivity analysis was therefore required to be undertaken as part of the air quality assessment.

¹⁹ Defra (2021) Emission Factor Toolkit [https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html]

²⁰ Defra (2019) NO_x to NO₂ Calculator [https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc]

²¹ Defra (2019) background pollutant concentration maps [https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2019]

²² Institute of Air Quality Management (2018) Position Statement: Dealing with Uncertainty in Vehicle NO_x Emissions within Air Quality Assessments, Version 1.1

Proposed Receptor Locations

- 3.17 Pollutant concentrations were predicted across the Site to consider the suitability of the Site, for the proposed sensitive residential uses, with regard to the current air quality objectives for England. Pollutant concentrations were predicted across the Site for Scenario 2: 2025 Opening Year with development. A Cartesian grid was modelled at a height of 1.5m to represent average breathing height at ground floor to cover the following grid references: minimum X 382834, Y 390000 to maximum X 383425, Y 390585.

Limitations and Assumptions

- 3.18 There are uncertainties associated with both measured and predicted pollutant concentrations. The model (ADMS-Roads) used in this assessment relies on input data, which are also subject to uncertainty. The model itself simplifies complex physical systems into a range of algorithms. In addition, local micro-climatic conditions may affect the concentrations of pollutants that the ADMS-Roads model will not take into account.
- 3.19 The assessment is based on traffic data provided by Prime Transport Consulting, the transport consultants for the project. As such any assumptions made by the transport consultants will also influence the air quality assessment.
- 3.20 In future years scenarios, uncertainty relates to the projection of vehicle emissions and, in particular the rate at which emissions per vehicle will improve over time. This assessment utilised the most recent version of the Defra EFT²⁰ to provide the most up to date estimate of current and future emission projections.
- 3.21 To reduce the uncertainty associated with predicted concentrations, model verification was carried out following guidance set out in Defra guidance¹⁵. As the models were verified using local monitoring data and adjusted accordingly, there can be reasonable confidence in the predicted concentrations.

Assessment Criteria

- 3.22 Predicted pollutant concentrations were compared to the relevant air quality objectives⁶. The current relevant air quality standards and objectives for England are detailed in **Table 3.1**.

Table 3.1: Air Quality Standards and Objectives (England)

Pollutant	Averaging Period	Air Quality Objective ($\mu\text{g.m}^{-3}$)	Date to Achieve by
NO ₂	Annual mean	40	31 December 2005
	1-hour mean not to be exceeded more than 18 times per year	200	31 December 2005
PM ₁₀	Annual mean	40	31 December 2004

Pollutant	Averaging Period	Air Quality Objective ($\mu\text{g.m}^{-3}$)	Date to Achieve by
	24-hour mean not to be exceeded more than 35 times per year	50	31 December 2004
PM _{2.5}	Annual mean	20	1 January 2020
	<i>Annual mean interim target as detailed within the Environmental Improvement Plan²³</i>	12	31 January 2028
	Annual mean	10	31 December 2040

Italics denotes future air quality objectives published by the UK Government that will come into force in the future

²³ Defra (2023) Environmental Improvement Plan 2023, First revision of the 25 Year Environment Plan

4. BASELINE CONDITIONS

Local Air Quality Management

- 4.1 The Site is not located within an existing AQMA. However, sections of the GMCA AQMA are located approximately 140m south west and 190m north east of the Site and were declared for the potential exceedance of the current annual mean NO₂ objective.

Local Air Quality Monitoring

Nitrogen Dioxide

- 4.2 MCC undertakes NO₂ monitoring within its administrative boundary using a network of automatic monitoring stations and diffusion tubes. The closest monitoring location to the Site is the diffusion tube (MA93BNO), located approximately 680m south west of the Site.
- 4.3 Bias adjusted NO₂ monitoring results, for the locations in the vicinity of the proposed development Site, are detailed in **Table 4.1**. Exceedances of the annual mean NO₂ objective are highlighted in bold and potential exceedances of the one-hour mean NO₂ objective are bold and underlined.
- 4.4 Air quality monitoring in the vicinity of the Site commenced in 2019 and therefore there is no monitoring data prior to 2019 available for review.
- 4.5 Monitoring data was available up to and including 2022 has been included, however air quality monitoring undertaken in 2020 and 2021 are not considered representative of normal conditions due to the influence of COVID-19 lockdown restrictions on road traffic levels. In accordance with the Institute of Air Quality Management (IAQM) Position Statement²⁴, 2019 monitoring data should be treated as the last year of 'normal' monitoring data until such time that the impact of lockdown restrictions on pollutant concentrations is more fully understood.

Table 4.1: MCC NO₂ Monitoring Data in 2019 – 2022

Location and Reference	Grid Reference		Site Monitoring Type	Distance from and direction to Site boundary	Monitored Annual Average Concentration (µg.m ⁻³)			
					2019	2020	2021	2022
MA93BNO, Palatine Road	382419	390010	Roadside	680m south west	42.9	29.4	33.8	34.0
MAN-T2, A5103 (Princess Parkway)*	382291	389730	Roadside	920m south west	56.1	33.7	28.4	23.6
MAN-T3, A5103 (Princess Parkway)*	382326	389764	Roadside	870m south west	<u>69.7</u>	42.1	38.8	49.2

²⁴ Institute of Air Quality Management (2021) Position Statement: Use of 2020 and 2021 Monitoring Datasets

Location and Reference	Grid Reference		Site Monitoring Type	Distance from and direction to Site boundary	Monitored Annual Average Concentration ($\mu\text{g.m}^{-3}$)			
					2019	2020	2021	2022
MAN-T4, A5103 (Princess Parkway) *	382321	390246	Roadside	720m west	<u>60.6</u>	36.5	41.2	40.0
MAN-T5, A5103 (Princess Parkway) *	382379	390358	Roadside	670m west	<u>75.9</u>	50.0	53.8	57.2

* Manchester Clean Air Plan Monitoring Location

- 4.6 Monitored annual mean NO_2 concentrations exceeded the annual mean NO_2 objective of $40\mu\text{g.m}^{-3}$ at all monitoring locations detailed in **Table 4.1** in 2019 with monitoring locations MAN-T3, MAN-T4 and MAN-T5 also recording exceedances above $60\mu\text{g.m}^{-3}$, indicating a potential exceedance of the NO_2 1-hour mean objective. Monitored pollutant concentrations decreased in 2020 and 2021 with monitoring locations MA93NO and MAN-T2 recording concentrations below the annual mean NO_2 objective in both years. This was considered to be a result of lockdown restrictions influencing traffic levels during the COVID-19 pandemic in 2020. Monitoring locations MA93BNO and MAN-T2 were below the annual mean NO_2 objective for England in 2022, whereas MAN-T3, MAN-T4 and MAN-T5 exceeded the annual mean NO_2 objective.
- 4.7 Monitoring location MA93BNO was utilised in model verification, as detailed in **Appendix F**. Monitoring locations MAN – T2, MAN – T3, MAN – T4 and MAN – T5 were discounted from the model verification process as they are from the Manchester Clean Air Plan²⁵, which is not considered to meet the local air quality management requirements. Verification was undertaken using 2019 monitoring data rather than 2022 monitoring data, this is due to the large decrease in monitored concentrations from 2019 to 2022. Using 2022 monitoring data would result in a lower adjustment factor, therefore utilising 2019 monitoring data allows for a more robust assessment.

Particulate Matter (PM_{10} and $\text{PM}_{2.5}$)

- 4.8 No monitoring of particulate matter (PM_{10} or $\text{PM}_{2.5}$) is undertaken within vicinity of the Site. However, the STK6 monitoring location is located approximately 2.7km south east of the Site. This monitoring location recorded PM_{10} concentration of $16.0\mu\text{g.m}^{-3}$ in 2022.

²⁵ Clean Air Greater Manchester (no date) <https://cleanairgm.com/data-hub/monitoring-reports/>

Background Pollutant Concentrations

- 4.9 MCC undertake background monitoring within the vicinity of the Site. Upon review, monitored background NO₂ concentrations at monitoring locations in the vicinity of the Site show considerable variability between the different locations and none were considered to be representative of conditions at the Site. No background air quality monitoring of PM₁₀ and PM_{2.5} is undertaken by MCC within the study area. As such, background pollutant concentrations were obtained from the latest Defra background concentration maps²¹ which are provided for the UK as a 1km x 1km grid network. The latest maps are based on 2018 monitoring and meteorological data. Background concentrations of NO₂, PM₁₀ and PM_{2.5} were obtained for the grid squares covering the study area for the years of assessment (2019 and 2025). The background concentrations used in the assessment are detailed in **Table 4.2**.

Table 4.2: Background Pollutant Concentrations used in the Assessment

Pollutant	Grid Square	Monitoring Locations / Receptors	Concentration (µg.m ⁻³)		
			2019	2023	2025
Proposed Receptor Location					
NO ₂	383500, 390500	Site	19.7	16.3	14.9
PM ₁₀			12.1	11.5	11.3
PM _{2.5}			8.0	7.6	7.5
Verification Location					
NO ₂	382500, 390500	MA93BNO	22.6	18.5	16.8
PM ₁₀			13.4	12.7	12.6
PM _{2.5}			8.8	8.3	8.3

- 4.10 As shown in **Table 4.3**, background concentrations are below the current relevant annual mean air quality objectives for NO₂, PM₁₀ and PM_{2.5} for the assessment years of 2019 and 2025. Furthermore, background PM_{2.5} concentrations in the assessment years are below both the 2028 interim target of 12µg.m⁻³ and the 2040 future objective of 10µg.m⁻³.

5. CONSTRUCTION PHASE DUST ASSESSMENT

- 5.1 The construction phase of the proposed development will involve a number of activities which have the potential to impact on local air quality. These include emissions of dust generated through excavation, construction, earthworks and trackout activities, exhaust pollutant emissions from construction traffic on the local highways network, and exhaust emissions from non-road mobile machinery (NRMM) within the construction site itself.
- 5.2 The location of sensitive receptors in relation to construction activities will affect the potential for such construction activities to cause dust soiling, nuisance and local air quality impacts. Meteorological conditions and the use of control measures will also contribute to the effects experienced.

Step 1: Screen the Need for a Detailed Assessment

- 5.3 Step 1 of the IAQM guidance¹⁶ involves a screening assessment to consider whether a more detailed construction phase dust assessment is required.
- 5.4 In accordance with the guidance, a detailed assessment is required if:
- Human receptors are located within 250m of the boundary of the site or 50m of routes used by construction vehicles on the public highways, up to 250m from the site entrances; and/or
 - Ecological receptors are located within 50m of the boundary of the site or 50m of routes used by construction vehicles on the public highways, up to 250m from the site entrances.
- 5.5 From a review of the Multi Agency Geographic Information for the Countryside (MAGIC) website²⁶, no ecological designations were identified within the above screening distance and therefore the impact on ecological designations was not considered further. However human receptors are located within the above screening distances, with the closest of these receptors located off Brett Road and Allanson Road. A construction phase assessment was therefore undertaken.

Step 2: Assess the Risk of Dust Impacts

Step 2A: Define the Potential Dust Emission Magnitude

- 5.6 The dust emission magnitudes for the construction activities were defined using the criteria detailed in the IAQM guidance¹⁶ as detailed in **Table 5.1**.

²⁶ Defra, Multi Agency Geographic Information for the Countryside (MAGIC) [<http://magic.defra.gov.uk/>]

Table 5.1: Dust Emission Magnitude Criteria and Definition

Activity	IAQM Dust Emission Magnitude	IAQM Dust Emission Magnitude Criteria
Demolition	Large	Total building volume >75,000 m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level.
	Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material, demolition activities 6-12 m above ground level.
	Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.
Earthworks	Large	Total site area >110,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.
	Medium	Total site area 18,000 m ² – 110,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height.
	Small	Total site area <18,000 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.
Construction	Large	Total building volume >75,000 m ³ , on site concrete batching, sandblasting;.
	Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching.
	Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)).
Trackout	Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m.
	Medium	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m.
	Small	<20 HDV (>3.5t) outward movements in any one day, 10 surface material with low potential for dust release, unpaved road length <50 m.

5.7 The following dust emissions magnitudes were defined for the proposed development:

- Demolition – the proposed development will require the demolition of all existing buildings within the Site. The total building volume to be demolished is less than 12,000m³. The dust emissions magnitude for demolition was therefore defined as **Small**.
- Earthworks – the total Site area is less than 18,000m² and therefore the dust magnitude for earthworks was defined as **Small**.
- Construction – the total building volume is between 12,000m³ – 75,000m³ and therefore the dust emission magnitude for construction was defined as **Small**.
- Trackout – due to the scale of the proposed development, there is anticipated to be less than 20 HDV outward movements in any one day during the construction phase and therefore the dust emissions magnitude for trackout was defined as **Small**. A trackout distance of up to 50m was used in the assessment, in accordance with the IAQM guidance¹⁶.

5.8 A summary of the defined dust emissions magnitudes for the development are provided in **Table 5.2**.

Table 5.2: Summary of Project Defined Dust Emissions Magnitudes

Activity	Dust Emissions Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

Step 2B: Define the Sensitivity of the Area

5.9 The assessment requires the determination of the sensitivity of the area for the purposes of dust soiling and human health impacts. The sensitivity of the study area takes into account the specific receptors in the vicinity of the Site, the proximity and number of those receptors, the local background concentration of PM₁₀ and site-specific factors. **Figure 5.1** was utilised to determine the number of receptors located within the distance bands provided in the IAQM guidance¹⁶ for determining receptor sensitivity.

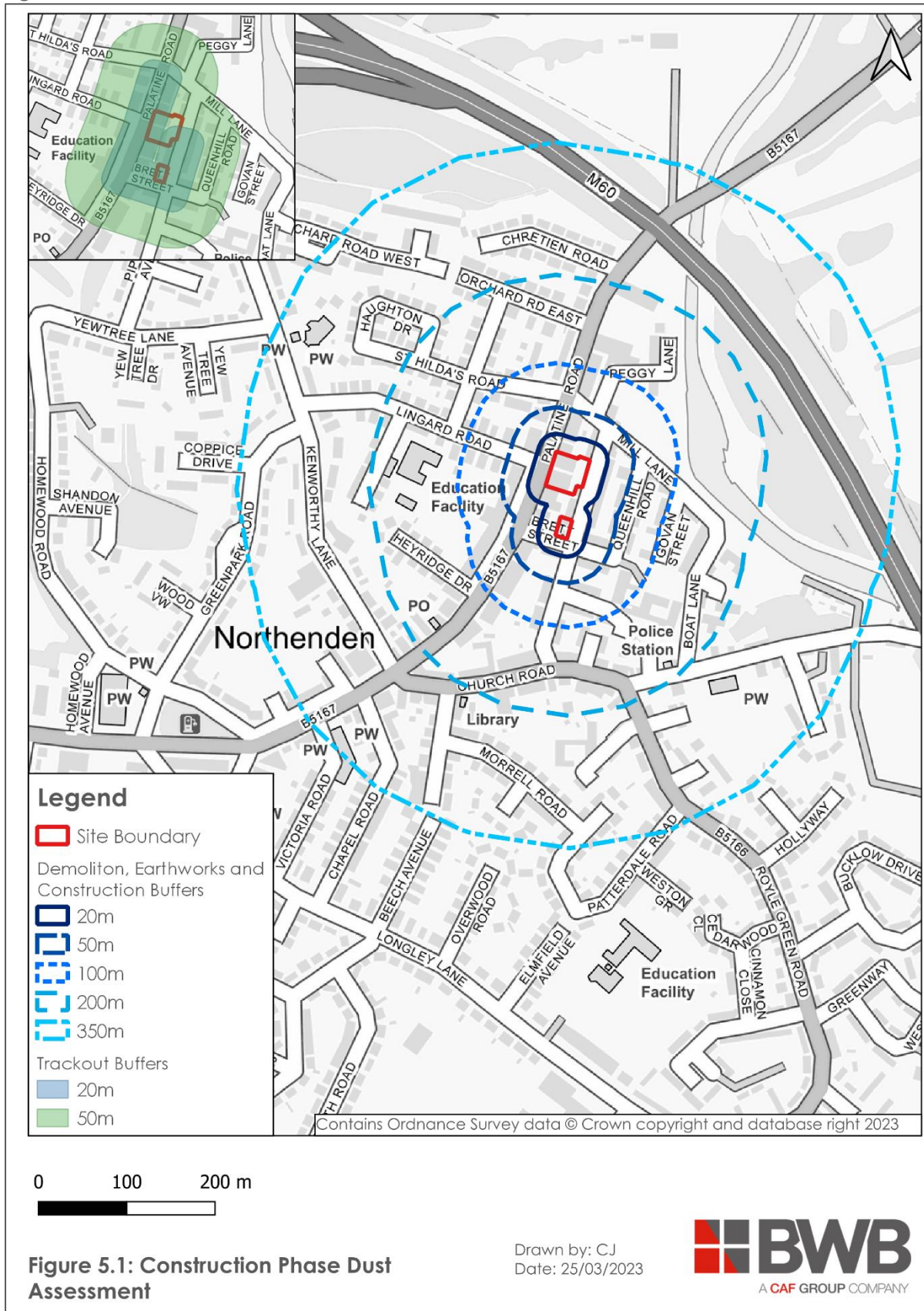
5.10 The sensitivity of the area is defined below, in accordance with IAQM criteria¹⁶ and summarised in **Table 5.3**.

- Dust Soiling – there are between 10 and 100 highly sensitive residential receptors located within 20m of the proposed Site boundary and within 20m of roads used by construction traffic. Therefore, the sensitivity of the area to dust soiling is defined as 'High'.
- Human Health – There are between 10 and 100 highly sensitive residential receptors within 20m of the Site boundary and within 20m of the roads used by construction traffic. In addition, the 2023 background concentration of PM₁₀ at the Site as shown in **Table 4.2**, is less than 24µg.m⁻³ and therefore the sensitivity of the area to human health impact was defined as 'Low'.

Table 5.3: Determination of the Sensitivity of the Area

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

Figure 5.1: Construction Phase Assessment Dust Distance Buffers



Step 2C: Define the Risk of Impacts

- 5.11 The dust emission magnitude determined in Step 2A is then combined with the sensitivity of the area determined in Step 2B to define the risk of dust impacts with no mitigation applied. The results of this assessment are detailed in **Table 5.4**.

Table 5.4: Summary Dust Risk Table to Define Site Specific Risk

Activity	Step 2A: Dust Emission Magnitude	Step 2B: Sensitivity of the Area	Step 2C: Risk of Dust Impacts
<i>Dust Soiling Effects on People and Property</i>			
Demolition	Small	High	Medium Risk
Earthworks	Small	High	Low Risk
Construction	Small	High	Low Risk
Trackout	Small	High	Low Risk
<i>Human Health Impacts</i>			
Demolition	Small	Low	Negligible
Earthworks	Small	Low	Negligible
Construction	Small	Low	Negligible
Trackout	Small	Low	Negligible

Step 3: Site-Specific Mitigation

- 5.12 The risk of dust impacts, defined in Step 2C of the assessment, is used to determine the mitigation measures required to minimise the emission of dust during construction phase activities. The IAQM guidance¹⁶ provides details of highly recommended and desirable mitigation measures which are commensurate with the risk of dust impacts defined in Step 2C for demolition, construction, earthworks and trackout activities. Where the mitigation measures are general in nature, the highest risk category was applied in accordance with the guidance¹⁶. The highest risk category identified was 'Medium Risk' and the recommended mitigation taken from the IAQM guidance¹⁶ is detailed in **Table 5.5** and **Table 5.6**.

Table 5.5: Mitigation Measures for a Medium Risk Site

Category	Mitigation Measures for a Medium Risk Site	
	Highly Recommended	Desirable
Communication	Develop and implement a stakeholder communications plan that includes	None

Category	Mitigation Measures for a Medium Risk Site	
	Highly Recommended	Desirable
	community engagement before work commences on site.	
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager.	
	Display the head or regional office contact information.	
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.	
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.	None
	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.	
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspections results, and make an inspection log available to the local authority when asked.	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 100m of the site boundary, with cleaning to be provided as necessary.
	Increase the frequency of site inspections 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 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 possible.	None
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period.	
	Avoid site runoff of water or mud.	
	Keep site fencing, barriers and scaffolding clean using wet methods.	

Category	Mitigation Measures for a Medium Risk Site	
	Highly Recommended	Desirable
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	
	Cover, seed or fence stockpiles to prevent wind whipping.	
Operating vehicle/ machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	
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.	None
	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 and dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	
Waste Management	Avoid bonfires and burning of waste materials.	None

Table 5.6: Mitigation Measures Specific to Demolition, Earthworks, Construction and Trackout

Category	Mitigation Measures	
	Highly Recommended	Desirable
Demolition (Medium Risk Site)	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.	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	
	Bag and remove any biological debris or damp down such material before demolition.	
Earthworks (Low Risk Site)	None	None
Construction (Low Risk Site)	None	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.
Trackout (Low Risk Site)	None	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any materials 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 the 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).

Step 4: Determine Significant Effects

- 5.13 In accordance with IAQM guidance¹⁶, with the implementation of the mitigation measures detailed in Step 3, the residual impacts from the construction phase are considered to be 'not significant'.

6. OPERATIONAL PHASE ROAD TRAFFIC EMISSIONS SCREENING ASSESSMENT

IAQM and EPUK Guidance

- 6.1 The trip generation for the proposed development was screened using IAQM and EPUK Stage 1 and Stage 2 criteria¹⁷ to determine whether a detailed air quality assessment was required.

Stage 1

- 6.2 The proposed development comprises more than 10 residential units and proposes more than 10 parking spaces; it was therefore necessary to proceed to Stage 2.

Stage 2

- 6.3 The Site is not located within an existing AQMA, however sections of Palatine Road are located within the GMCA AQMA approximately 190m north east and 140m south west of the Site.
- 6.4 The trip generation for the proposed development was provided by Prime Transport Consulting, the Transport Consultants for the project.
- 6.5 It was confirmed that the predicted trip generation for the proposed development is 172 LDVs and 6 HDVs as a 24-hour AADT flow which is a reduction from the existing trip generation for the current use of the Site of 260 LDVs and 4 HDVs as a 24-hour AADT flow. The predicted trip generation therefore does not exceed the relevant screening criteria for development outside an AQMA. However, the predicted trip generation is above the relevant screening criteria of more than 100 vehicles as a 24 hour AADT flow within an AQMA.
- 6.6 It was further confirmed by the project transport consultant that the predicted trip generation is distributed 57% north and 43% south on Palatine Road, which equates to 98 LDVs and 3 HDVs north and 73 LDVs and 2 HDVs south as 24-hour AADT flows. Therefore, the predicted trip generation does not exceed the screening criteria thresholds provided in the IAQM and EPUK¹⁶ guidance of 100 LDVs and 25 HDVs as a 24-hour AADT within an AQMA. The IAQM and EPUK guidance¹⁶ states:

"If none of the criteria are met, then there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect".

- 6.7 The impact on local air quality as a result of the road traffic associated with the proposed development does therefore not require detailed assessment and the impact on local air quality is considered to be insignificant in accordance with IAQM and EPUK guidance¹⁷.

Site Suitability Assessment

- 6.8 Concentrations of NO₂, PM₁₀ and PM_{2.5} were predicted across the Site to determine the suitability of the Site for the proposed partial residential use with regard to air quality.
- 6.9 A Cartesian grid from minimum X 382834, Y 390000 to maximum X 383425, Y 390585 was modelled at a height of 1.5m to represent average breathing height at ground floor across the Site.
- 6.10 Pollutant concentrations were predicted across the Site for Scenario 2: 2025 Opening Year. **Figures 6.1 – 6.3** illustrate annual mean pollutant concentration contours for NO₂, PM₁₀ and PM_{2.5} at ground floor, respectively, across the Site.

Figure 6.1: Predicted Annual Mean NO₂ Concentrations Across the Site



Figure 1.2: Predicted Annual Mean PM₁₀ Concentrations Across the Site

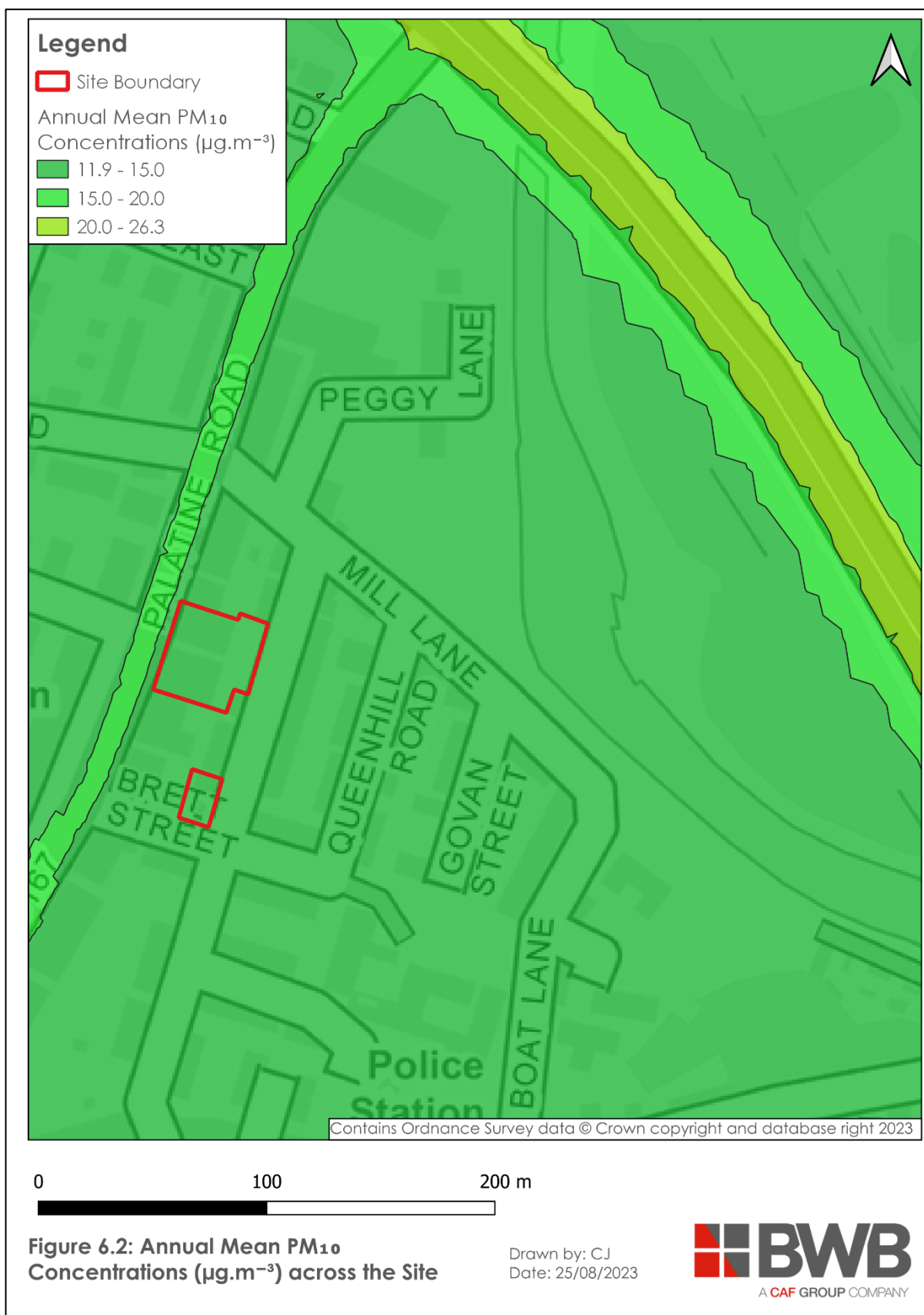
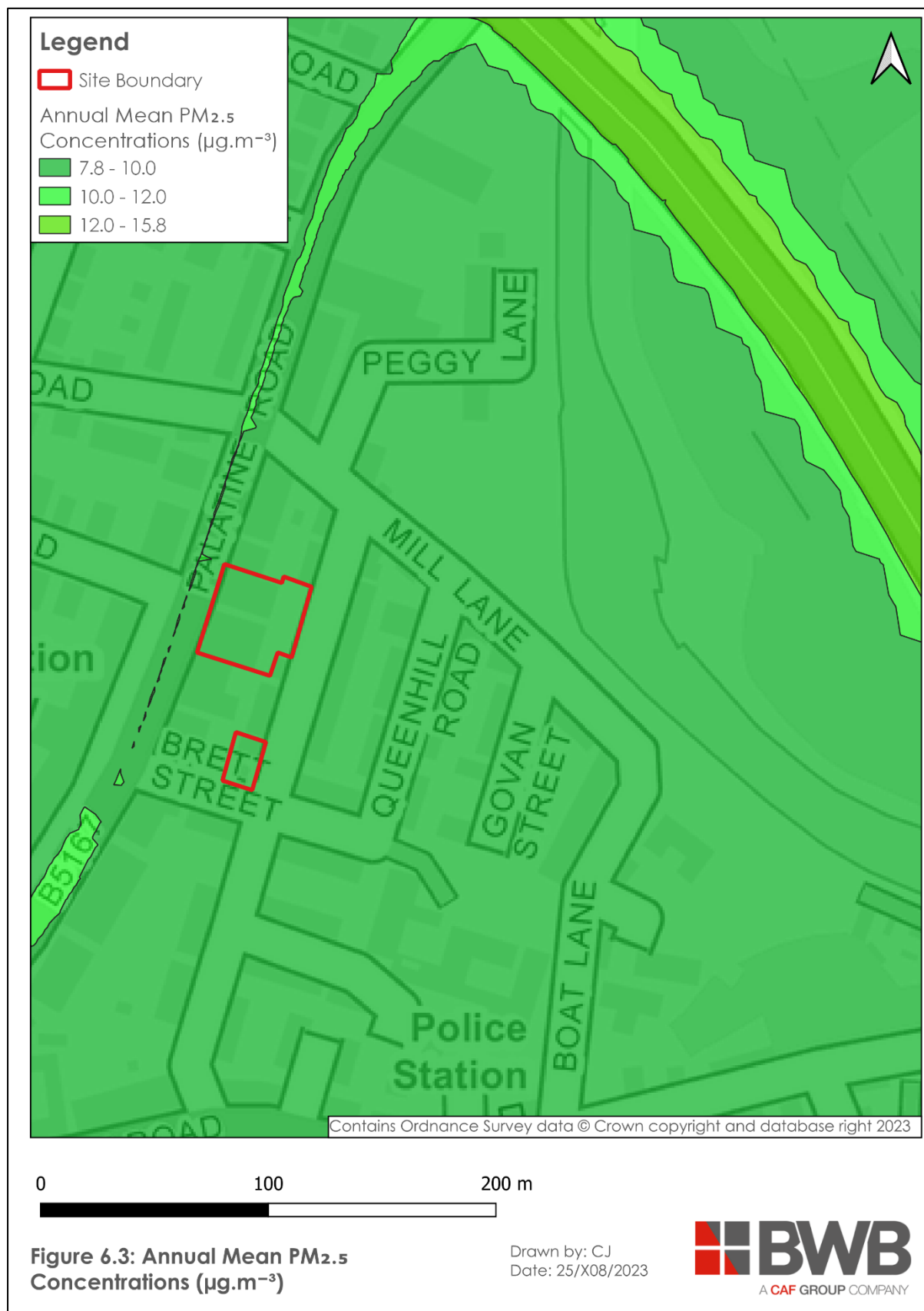


Figure 1.3: Predicted Annual Mean PM_{2.5} Concentrations Across the Site



- 6.12 The predicted NO₂, PM₁₀ and PM_{2.5} concentrations across the Site for Scenario 2: 2025 Opening Year with development are below the respective current air quality objectives for England. Predicted PM_{2.5} concentrations across the Site are also below the 2028 interim annual mean PM_{2.5} target of 12µg.m⁻³ and the 2040 future PM_{2.5} annual mean objective of 10µg.m⁻³.
- 6.13 With regard to short term air quality objectives for NO₂ and PM₁₀ at the proposed development, the predicted annual mean NO₂ concentrations are less than 60µg.m⁻³ and therefore in accordance with Defra guidance¹⁵ it may be assumed that exceedance of the 1-hour mean NO₂ objective are unlikely. The calculation detailed in paragraph 3.18 was used to determine potential exceedance of the 24-hour PM_{2.5} short term objective; no exceedances were predicted.
- 6.14 Given no exceedance of the current relevant air quality objectives were predicted across the Site, no mitigation measures are required at the Site with regard to air quality.

Development Measures

- 6.15 Whilst the proposed development was not considered to give rise to significant air quality impacts as a result of development-generated road traffic, measures are proposed as part of the development which may be beneficial to local air quality. These include:
- Provision of a Travel Plan, detailing local public and active travel routes and bus timetables; and
 - Provision of Electric Vehicle charge points for each car parking space included in the development proposals, to encourage uptake of low emission vehicles.

7. CONCLUSION

- 7.1 An air quality assessment was undertaken for a proposed mixed-use development at land off Palatine Road and Brett Street in Northenden, Manchester.
- 7.2 A qualitative construction phase assessment was undertaken and measures were recommended to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions is considered to be 'not significant' in accordance with IAQM guidance¹⁶.
- 7.3 The predicted trip generation for the proposed development was screened using the IAQM and EPUK¹⁶ two stage screening process. The predicted trip generation did not exceed the relevant screening criteria for development outside and within an AQMA and therefore detailed air dispersion modelling was not undertaken. Air quality impacts as a result of additional road traffic emissions associated with the Site were therefore considered to be not significant.
- 7.4 An exposure assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance¹⁴, in which concentrations of NO₂, PM₁₀ and PM_{2.5} were predicted across the Site using the air dispersion model ADMS-Roads. Concentrations of NO₂, PM₁₀ and PM_{2.5} across the Site were predicted to be below the relevant current air quality objectives for England. Therefore, the Site was considered suitable for the proposed residential use with regard to the current air quality objectives.
- 7.5 Based on the assessment results, the impact of the proposed development on air quality was determined to be 'not significant' and mitigation measures are not required. However, measures proposed as part of the development which may be beneficial to local air quality include a Travel Plan and Electric Vehicle Charging Points for each car parking space included in the development proposals.

APPENDICES

APPENDIX A: GLOSSARY OF TERMS

Term	Definition
AADT	Annual Average Daily Traffic flow.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	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 the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between two years, which is useful for pollutants that have higher concentrations during the winter months.
AQAP	Air Quality Action Plan.
AQMA	Air Quality Management Area.
AQS	Air Quality Strategy.
Defra	Department for Environment, Food and Rural Affairs.
EPUK	Environmental Protection UK.
Exceedance	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
HDV	Heavy Duty Vehicles (HGVs + buses and coaches)
HGV	Heavy Goods Vehicles.
IAQM	Institute of Air Quality Management.
LAQM	Local Air Quality Management.
LDV	Light Duty Vehicles (motorbikes, cars, vans and small trucks)
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO ₂	Nitrogen dioxide.
NO _x	Nitrogen oxides.
Percentile	The percentage of results below a given value.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
micrograms per cubic metre (µg.m ⁻³)	A measure of concentration in terms of mass per unit volume. A concentration of 1 µg.m ⁻³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

APPENDIX B: PROPOSED DEVELOPMENT MASTERPLAN



- NOTES
- All dimensions and levels are to be checked on site.
 - Any discrepancies are to be reported to the architect before any work commences
 - This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
 - This drawing shall not be reproduced without express written permission from AEW.
 - Title overlay drawings and ownership boundaries are produced using all reasonable endeavors. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
 - All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
 - All proprietary materials and products are to be used strictly in accordance with the manufacturers recommendations.

CDM 2015

Client notified of duties: **TBC**
Principal Designer: **TBC**

Unless noted below, all known hazards have been highlighted on the drawing:

0 5 10 15 20 25m



Scale 1:500 @ A3



Application Boundary
0.2 ha / 0.56 ac

P02	24/07/23	RP	BR
Initial issue			
P01	21/07/23	RP	BR
Initial issue			
REV	Date	Drawn by: -	Checked by: -
Status	Purpose of Issue		
S2	For Comment		
drawing stage	Planning		
client	RPC Planning		
project	Northenden, Palatine Road		
drawing title	Proposed Site Plan		
date	19/07/2023	drawn	RP
scale@A3	1:500	checked	BR

Rev

P02

12165-AEW-SI-XX-DR-A-0502

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APPENDIX C: PLANNING POLICY AND LEGISLATION

National Legislation and Planning Policy

The UK Air Quality Strategy

European Union (EU) legislation forms the basis of air quality policy and legislation in the UK. The EU 2008 ambient Air Quality Directive¹ sets limits for ambient concentrations of air pollutants including nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). The air quality standards and objectives are prescribed through the Air Quality (England) Regulations 2000², as amended, for the purpose of the Local Air Quality Management Framework. The Air Quality (England) Regulations were amended in 2002⁵ and again in 2010⁶, with miscellaneous amendments added in 2020⁹ following the UK exit from the EU. Additionally, an updated PM_{2.5} objective was published in 2023¹⁰ with an interim target to be achieved by 2028²³.

The UK Government are required under the Environment Act 1995³ to produce a national Air Quality Strategy (AQS). The AQS was first published in 1997⁷ and was most recently reviewed and updated in 2007⁸ and 2023¹⁰. The AQS provides an overview of the Government's ambient air quality policy and sets out the air quality standards and objectives to be achieved and measures to improve air quality.

The Environment Act 2021⁴ was granted Royal Assent in November 2021 and contains amendments to Part IV of the Environment Act 1995³ with regard to the Local Air Quality Management regime. Under the Environment Act 2021⁴, the Secretary of State must lay a statement before Parliament setting out progress made in meeting air quality objectives and standard in England and steps taken towards achieving the standards. The Environment Act 2021⁴ also places responsibility on local authorities to co-operate with air quality partners in the preparation of Air Quality Action Plans and identification of measures which should be monitored within the Plan and dates by which they should be implemented.

Part IV of the Environment Act³ requires local authorities in the UK to review local air quality within their administrative area and, if relevant air quality standards and objectives are likely to be exceeded, designate Air Quality Management Areas (AQMAs). Following the designation of an AQMA, local authorities are required to publish an Air Quality Action Plan (AQAP) detailing measures to be taken to improve local air quality and work towards meeting the relevant air quality standards and objectives.

National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹² was amended in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

The NPPF¹² recognises air quality within Section 15: Conserving and enhancing the natural environment, and states that:

"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;

[...]

Ground conditions and pollution

[...]

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.

[...]

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."

With regard to assessing cumulative effects the NPPF¹² states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.

[...]"

Planning Practice Guidance

The Planning Practice Guidance (PPG) for air quality¹³ was updated in November 2019 and provides guiding principles on how the planning process can take account of the impacts of new development on air quality.

The PPG¹³ sets out the following with regard to air quality and planning:

- "What air quality considerations does planning need to address;
- What is the role of plan-making with regard to air quality;

- *Air quality concerns relevant to neighbourhood planning;*
- *What information is available about air quality;*
- *When could air quality considerations be relevant to the development management process;*
- *What specific issues may need to be considered when assessing air quality impacts;*
- *How detailed does an air quality assessment need to be; and*
- *How can an impact on air quality be mitigated".*

The PPG¹³ sets out the pollutants for which there are legally binding limits for concentrations and those which the UK also has national emissions reduction commitments.

The PPG¹³ states that development plans may need to consider:

- *"what are the observed trends shown by recent air quality monitoring data and what would happen to these trends in light of proposed development and / or allocations;*
- *the impact of point sources of air pollution (pollution that originates from one place);*
- *the potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments, including their implications for vehicle emissions;*
- *ways in which new development could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example, entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable; and*
- *opportunities to improve air quality or mitigate impacts, such as through traffic and travel management and green infrastructure provision and enhancement".*

The PPG¹³ also states what may be considered relevant to determining a planning application and these include whether a development would:

- *"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or*

plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;

- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value".*

The PPG¹³ provides guidance regarding what should be included within an air quality assessment. Examples of potential air quality mitigation measures are also provided.

Local Planning Policy

Manchester's Local Development Framework: Core Strategy Development Plan Document (2012)

MCC adopted the Local Development Framework: Core Strategy Development Plan Document¹⁴ in 2012. The Document covers a fifteen year period between 2012 and 2027 and outlines MCC's vision for Manchester as well as planning policies to deliver that vision. A review of the Document indicated the following policies are relevant to air quality:

"Policy CC 5 - Transport

Proposals will be supported that improve pedestrian safety, improve air quality and increase the scope for accessible public realm improvements.

[...]

"Policy T 1 - Sustainable Transport

To deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:-

[...]

Would reduce the negative impacts of road traffic for example, congestion, air pollution and road traffic accident casualties.

[...]

"Policy EN 16 - Air Quality

The Council will seek to improve the air quality within Manchester and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local

impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant. When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.

[...]

"Policy DM 1 - Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within the supplementary planning document:-

[...]

Effects on amenity, including privacy, light, noise vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

The above policies were taken into consideration throughout the undertaking of the assessment.

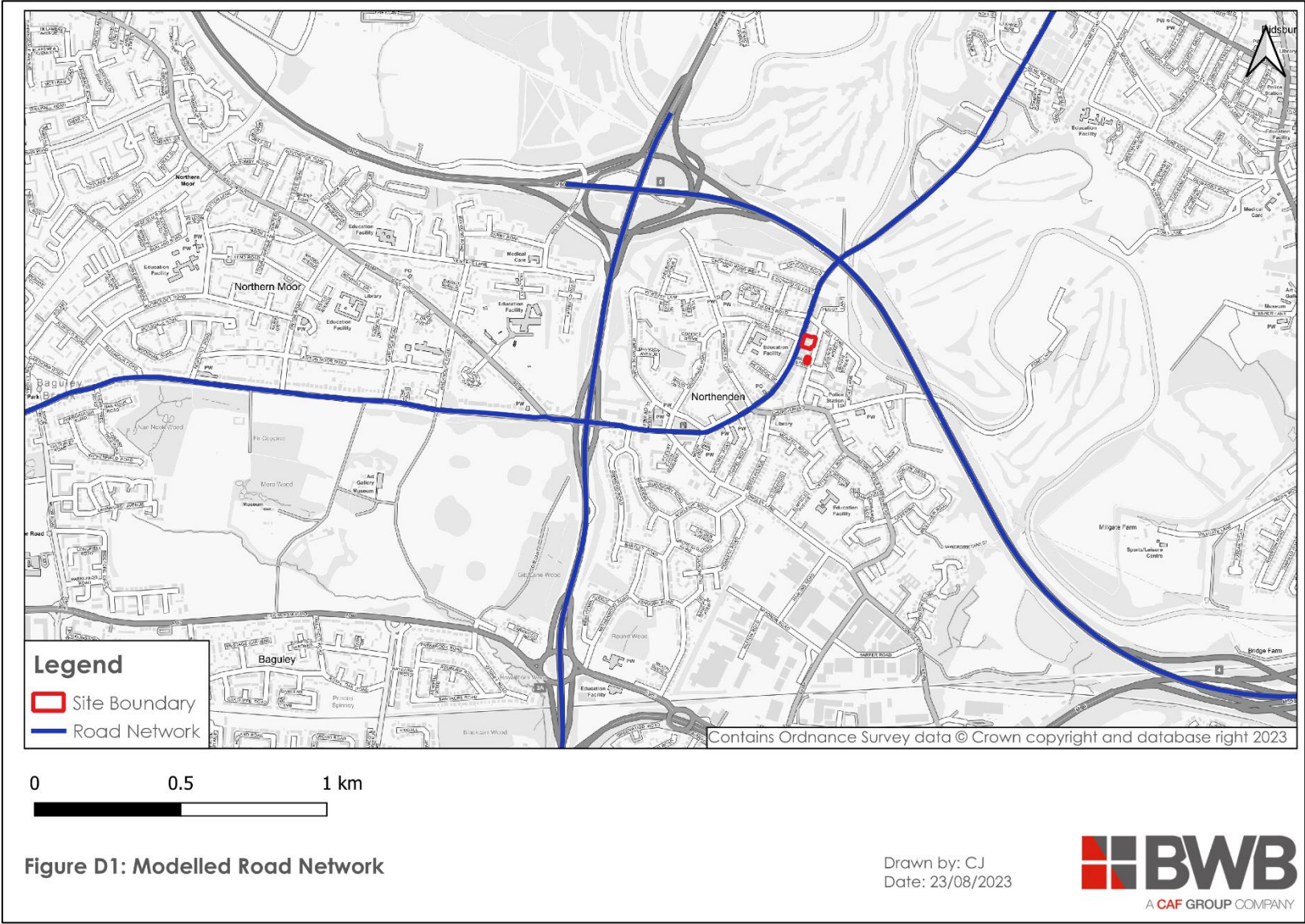
APPENDIX D: TRAFFIC DATA UTILISED IN THE AIR QUALITY ASSESSMENT

Table D1: Traffic Data Utilised in the Air Dispersion Modelling Assessment

Road Link	Speed	Scenario 1: 2019 Verification Year		Scenario 2: 2025 Opening Year With Development	
	Km.hr ⁻¹	24 hour AADT Total Flow	HDV Flow	24 hour AADT Total Flow	HDV Flow
Palatine Road East of the A5103 Princess Parkway	32, 22	15,066	421	16,216	433
M60 motorway	112, 80	79,093	3,242	84,226	3,284
Wythenshawe Road West of the A5103 Princess Parkway	48, 38	2,087	83	Traffic Data was not required for these scenarios	
A5103 Princess Parkway (North of Wythenshawe Road)	80, 64	12,2887	4,792		
A5103 Princess Parkway (South of Wythenshawe Road)	80	98,310	3,834		

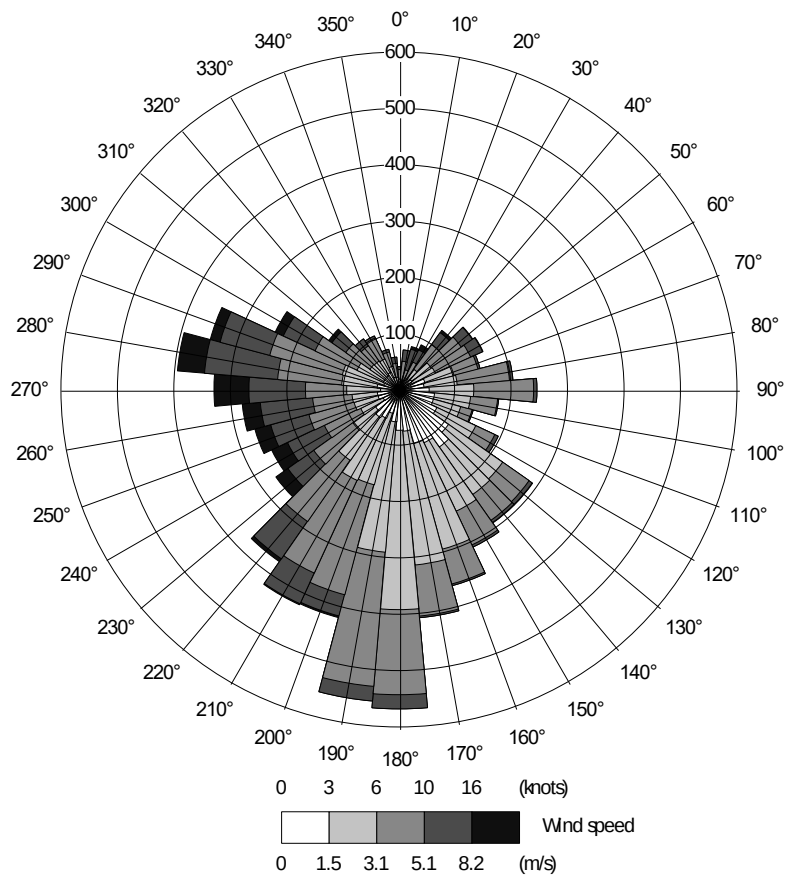
An illustration of the road links included in the ADMS-Roads model is provided in **Figure D1**.

Figure D1: Road Links Included in the ADMS-Roads Model



APPENDIX E: WIND ROSE FOR 2019 FOR MANCHESTER AIRPORT METEOROLOGICAL RECORDING STATION

Meteorological data for 2019 Verification Year scenario for the Manchester Airport recording station was obtained for use in the air dispersion modelling assessment. The wind rose for 2019 is detailed below and illustrates a predominant wind direction from the south and west.



APPENDIX F: MODEL VERIFICATION

Whilst ADMS-Roads is widely validated for use in this type of assessment, model verification for the area around the Site will not have been included. To determine model performance at a local level, a comparison of modelled results with monitored results in the study area was done in accordance with the methodology provided by Defra¹⁴. This process of verification aims to minimise modelling uncertainty by correcting modelled results by an adjustment factor to give greater confidence to the results.

The model was run for Scenario 1: 2019 Verification Year to predict the 2019 annual mean road contributions of NO_x at the most representative monitoring location in the study area. The model outputs at this location were compared to the 2019 monitored concentrations to provide adjustment factors. **Figure F1** detailed the monitoring locations utilised in the model verification. Monitoring locations MAN – T2, MAN –T3, MAN – T4 and MAN – T5 were discounted from the model verification process as they are from the Manchester Clean Air Plan²⁵, which is not considered to meet the local air quality management requirements.

No monitoring of PM₁₀ or PM_{2.5} is undertaken within the study area. Therefore, the adjustment factor calculated during the NO_x verification process was utilised to adjust predicted concentrations of PM₁₀ and PM_{2.5}.

Table F1: NO_x Verification Process

Model Verification Steps	MA93BNO
2019 monitored total NO ₂ (µg.m ⁻³)	42.9
2019 background NO ₂ concentration (µg.m ⁻³)	22.6
Monitored road contribution NO _x (µg.m ⁻³)	42.3
Modelled road contribution NO _x (µg.m ⁻³)	32.0
Ratio of monitored road NO _x to modelled road NO _x	1.3
Adjustment factor for modelled road contribution NO_x	1.3223
Adjusted modelled road contribution NO _x (µg.m ⁻³)	41.5
Modelled total NO ₂ concentration (µg.m ⁻³)	42.6
Monitored total NO ₂ concentration (µg.m ⁻³)	42.9
% difference between modelled and monitored total NO ₂ concentration	-0.7
RMSE % (should be less than 25% and ideally less than 10%)	0.8%

* Road-NO_x component, determined from NO_x to NO₂ calculator

A road-NO_x factor of **1.3332** was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero. This factor was then applied to the modelled road-NO_x concentration, before conversion to NO₂ concentrations using the NO_x to NO₂ calculator provided by Defra.

Figure F1: Monitoring Locations Utilised in the ADMS-Roads Model Verification Process

