

AIR QUALITY ASSESSMENT

115 Chatham Street Reading

Produced by XCO₂ for Archel Homes Limited.

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AIR QUALITY ASSESSMENT

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EXECUTIVE SUMMARY

An assessment has been undertaken to quantify the potential impacts on local air quality associated with the construction and operation of the proposed development. Based on the results of the assessment, it is considered that development of the site would not cause a significant impact on local air quality.

The scheme is a five-storey residential building comprising 54 units and is located at Chatham Street in Reading, Berkshire.

During the construction phase, the site has the potential to generate dust nuisance beyond the application boundary. However, through the implementation of an Air Quality Dust Management Plan, the impacts will be effectively minimised and are unlikely to be significant.

Operational traffic associated with the proposed development is not anticipated to negatively affect local air quality as there will be a net reduction. A review of local air quality monitoring data indicates that existing pollutant concentrations at the site have been within the relevant air quality objectives for the last four years.

INTRODUCTION

This report presents an assessment of the potential impact on local air quality of the construction and operation of a proposed redevelopment at Chatham Street, Reading.

The scheme is a five-storey residential building comprising 54 units and is located on Chatham Street in Reading, Berkshire. The proposal includes demolition of existing buildings and the redevelopment of the site to provide 54 new homes together with car and cycle parking and private and communal amenity space.

The location of the proposed development is presented in Figure 1. The site falls within the city of Reading, in county of Berkshire. An Air Quality Management Area (AQMA) was previously declared in August 2009 for annual mean exceedances of NO₂. The AQMA area covers Reading Town Centre, including areas along the major radial road routes into Reading (including J11 of the M4) and along the railway lines where they pass through built-up areas. The primary source of emissions of this pollutant in the borough is road traffic.

An assessment has been undertaken to determine the potential impact on local air quality during both the construction and operational phases of the development, with recommendations made for mitigation where appropriate.

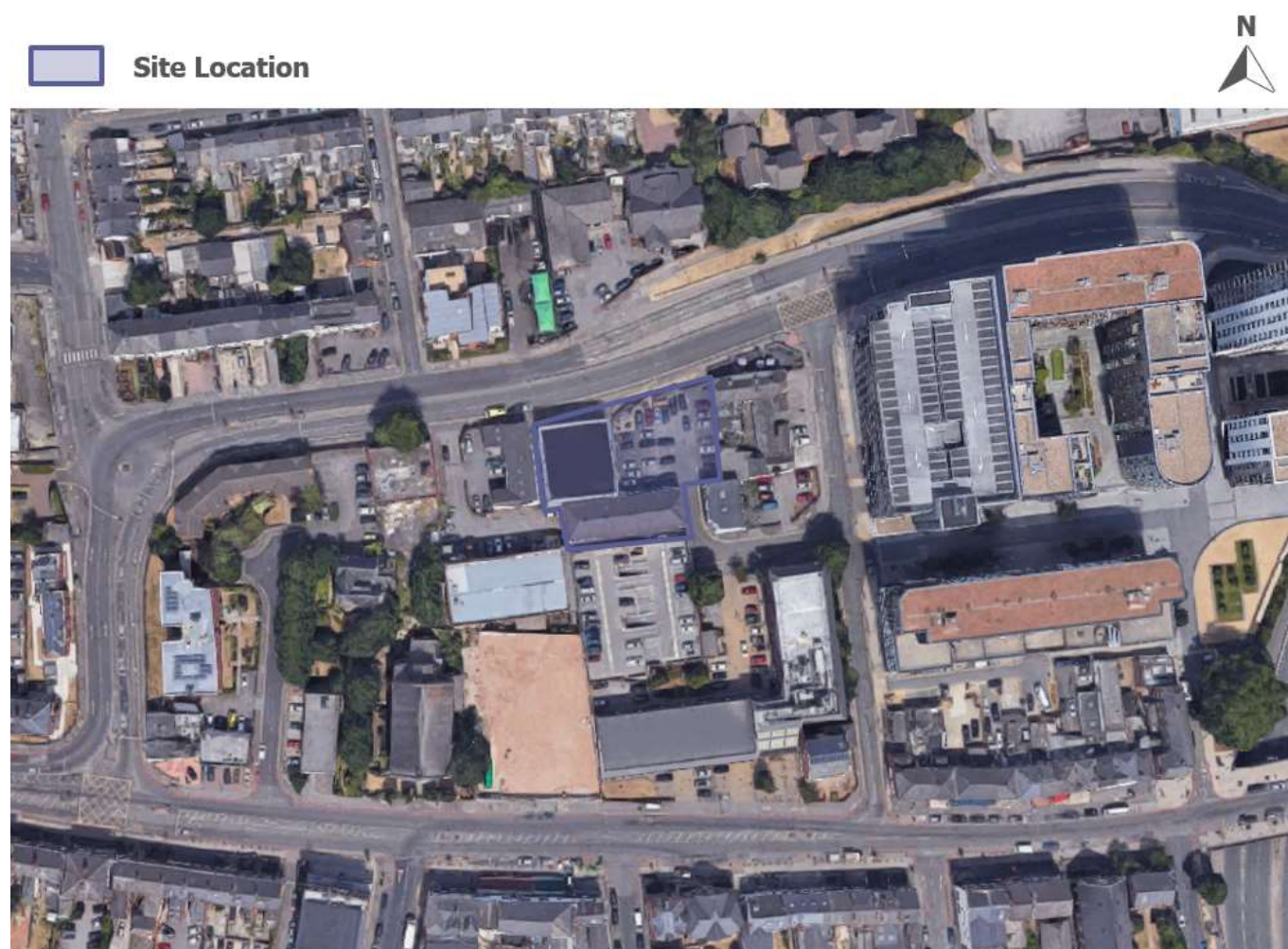


Figure 1: Site location.

POLICY CONTEXT

An overview of the relevant policy drivers for the assessment is provided in the following section.

EUROPEAN LEGISLATION

Within the European Union, ambient air quality is currently regulated through the Ambient Air Quality Directive 2008/50/EC¹ and the Fourth Daughter Directive 2004/107/EC². These directives set limit values and target values for ambient pollutant concentrations. The limit values are legally binding and must not be exceeded, whereas the target values are to be attained where it is cost effective to do so.

The Ambient Air Quality Directive provides limit values for sulphur dioxide (SO₂), nitrogen dioxide (NO₂), benzene (C₆H₆), carbon monoxide (CO), lead (Pb) and particulate matter (PM₁₀ and PM_{2.5})³. The Fourth Daughter Directive provides target values for arsenic (As), cadmium (Cd), nickel (Ni), benzo(a)pyrene (B(a)P), mercury (Hg) and polycyclic aromatic hydrocarbons (PAH)⁴.

The EU limit values have been adopted into UK law via the Air Quality Standards Regulations 2010⁵.

In the context of the proposed development, the primary pollutants of concern are NO₂, PM₁₀ and PM_{2.5} from traffic on roads close to the site. A summary of the European limit values for the protection of human health for these pollutants is presented in Table 1.

Table 1: Pollutant Limiting Values.

Pollutant	Averaging Period	Limit Value (µg/m ³)	Comments
NO ₂	1-hour	<200	Not to be exceeded more than 18 times per calendar year (equivalent to the 99.8 th percentile of 1-hour means)
	Calendar year	40	-
PM ₁₀	1-day	50	Not to be exceeded more than 35 times per year (equivalent to the 90.4 th percentile of 24-hour means)
	Calendar Year	40	-
PM _{2.5}	Calendar Year	25	Stage 1 LV (to be met by 01/01/15)
	Calendar Year	20	Stage 2 LV (to be met by 01/01/20)

¹ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

² Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

³ Particulate matter with an aerodynamic diameter below 10 µm and below 2.5 µm.

⁴ Polycyclic aromatic hydrocarbons other than benzo(a)pyrene.

⁵ The Air Quality Standards Regulations 2010, Statutory Instrument 2010 No. 1001, Environmental Protection.

NATIONAL LEGISLATION

THE AIR QUALITY STRATEGY FOR ENGLAND, SCOTLAND, WALES AND NORTHERN IRELAND

The Air Quality Strategy for England, Wales and Northern Ireland⁶ was published in 2007 and sets out policy targets (objectives) for SO₂, NO₂, C₆H₆, CO, Pb, PM₁₀, PM_{2.5}, 1,3-butadiene (C₄H₆) and PAH. These objectives are generally in line with those set by the European Directives, although more stringent particulate and benzene objectives apply in Scotland (and in Northern Ireland for benzene).

The air quality objectives (AQO) for NO₂, PM₁₀ and PM_{2.5} in England do not differ from those presented in Table 1.

LOCAL AIR QUALITY MANAGEMENT

The framework for Local Air Quality Management (LAQM) in the UK was introduced by the Environment Act 1995⁷. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values. Where an exceedance is identified the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s).

THE NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework (NPPF)⁸ sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF states that local "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 National Planning Policy Guidance (NPPG)⁹ for Air Quality, published in March 2014, outlines the principles upon which the planning process can take account of air quality impacts associated with new developments. It outlines the role of Local Plans in promoting sustainability and providing limitations on development in areas of poor air quality. An emphasis is placed on consultation with the planning authority to determine whether there are any local issues with the potential to affect the scope of an air quality assessment. Typical air quality mitigation measures are outlined highlighting the use of planning conditions and funding obligations to offset any significant impacts.

⁶ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland, July 2007.

⁷ Part IV of the Environment Act 1995

⁸ National Planning Policy Framework, Ministry for Housing, Communities and Local Government, July 2018.

⁹ <http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/>

LOCAL POLICY

THE BOROUGH OF READING REVIEW AND ASSESSMENT OF AIR QUALITY

Reading Borough Council (RBC) regularly review and assess air quality within the Borough in accordance with the requirements of Defra. Widespread exceedances of the annual mean air quality objective for NO₂ have been identified and as a consequence the entire borough has been designated an AQMA, see Figure 2 below.

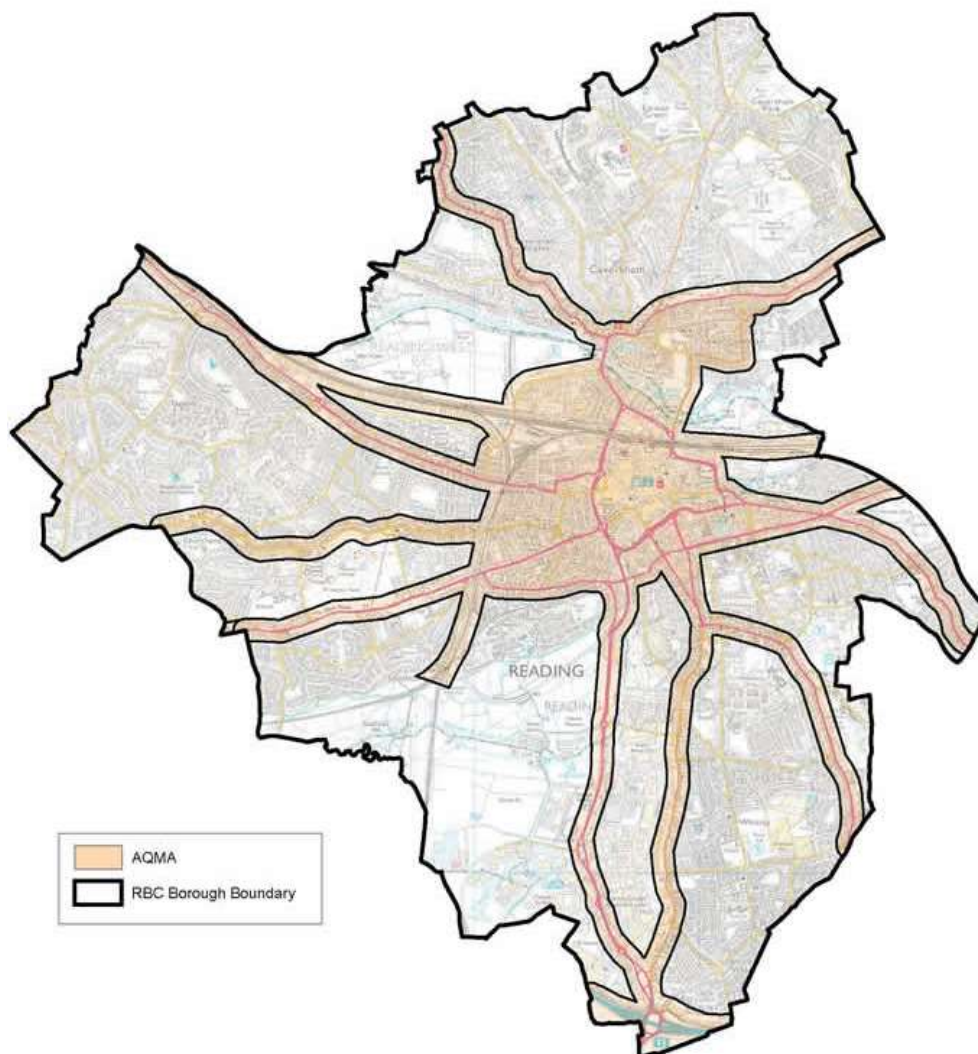


Figure 2: Reading AQMA.

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RBC's Air Quality Action Plan (AQAP) ¹⁰ outlines the council's commitment to improving air quality in the Borough. The key objectives of the plan include:

- Reducing emissions from the council's vehicle fleet;
- Increasing the number of electric vehicle charging points;
- Increasing the number of car club memberships;
- Promoting Travel Plans to schools and the Council;
- Implementation of reduced speed zones; and
- Improved cycling infrastructure.

The Action Plan draws on European and National legislation in conjunction with national, regional and local policy to manage and improve air quality across the Borough. The effectiveness of the AQAP is assessed through the council's ongoing air quality monitoring programme.

READING LOCAL PLAN 2019

Reading Borough Local Plan was issued last year for the period up until 2036, and includes a specific policy on air quality, within EN15.

EN15: AIR QUALITY

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

- i. 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.

¹⁰ Reading Borough Air Quality Action Plan 2016.

METHODOLOGY

This section outlines the assessment methodology, considering all relevant national and local policies and technical guidance relating to air quality.

CONSTRUCTION DUST

The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the Mayor of London's SPG for the control of dust and emissions during construction and demolition¹¹, which is closely aligned with the Institute of Air Quality Management (IAQM) construction dust guidance¹². A full description of the construction dust methodology is provided in Appendix A.

A detailed assessment of dust impacts is required where there are human or ecological receptors within:

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

The IAQM/ SPG methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors (human and ecological) and the anticipated magnitude of the dust emission due to:

- Demolition;
- Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements).

The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

CONSTRUCTION TRAFFIC

Construction traffic will contribute to existing traffic levels on the surrounding road network. However, the temporary increase in traffic is considered unlikely to be significant in terms of total flow or construction duration.

¹¹ The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance, The Mayor of London, July 2014

¹² Guidance on the assessment of dust from demolition and construction, IAQM,v1.1 June 2016

OPERATIONAL TRAFFIC

The Environmental Protection UK (EPUK)/ IAQM planning guidance¹³, states that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or
- There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

Traffic generated during the operational phase is anticipated to have a net impact. While there is no baseline traffic information available, there will be a reduction in traffic in the future scenario, therefore the development reflects an improvement in transport emissions impacting the air quality.

The proposed development is expected to generate 128 trips (based on a 0700-1900 trip rate). There is a reduction of 12 trips per day; 7 trips in the morning peak hours and 5 trips in the evening peak hours.

While the proposed development does include parking spaces, it is anticipated to generate well below the LGV, and HGV thresholds listed above for daily trips on the local road network, compared with the existing site use which is a taxi service with a car park. The proposed development has also made provision for 32 cycle parking spaces and 4 electric vehicle charging points. On this basis, despite the development falling within an AQMA, the impact of operational traffic on local air quality has been screened out of the assessment.

BUILDING-RELATED EMISSIONS

Heating and hot water will be supplied to the proposed development by electric systems.

¹³ Land-use Planning and Development Control: Planning for Air Quality, Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land use planning and development control process, May 2015.

BASELINE AIR QUALITY

Through an analysis of local monitoring data, a description of existing air quality near the proposed development is provided to determine whether on-site mitigation will be required to protect future occupants from poor air quality.

LOCAL AIR QUALITY MONITORING

Details of three automatic monitoring sites in the Borough of Reading are presented in the tables below. **Error! Reference source not found.**

Table 2: Automatic Monitoring Locations in Reading.

Site Name	Type	Easting	Northing	Pollutants Monitored	Approximate Location Relative to Proposed Development
Caversham Rd (RD1)	Roadside	471153	174429	NO ₂ , PM ₁₀	990m north-east
Oxford Rd (RD3)	Roadside	468700	174126	NO ₂ , PM ₁₀	2.4km north-west
London Rd (RD4)	Roadside	473703	173409	NO ₂ , PM ₁₀	2.3km east

Five years of annual mean NO₂ and PM₁₀ concentrations measured at these locations are summarised in Table 3 and Table 4 respectively, together with the number of measured exceedances of the short-term AQOs. The data capture was above 90% for both NO₂ and PM₁₀. Data was measured within 1km of the proposed development between 2014 and 2018 obtained from Reading County Council Air Quality Annual Status report (ASR)¹⁴.

The data indicates that annual mean roadside NO₂ concentrations in the area are generally within the AQO of 40 µg/m³. Only two marginal exceedances of the short-term objective have occurred in the last five years in 2014 and 2018.

Table 3: Automatically Measured NO₂ Concentrations.

Site Name	2014	2015	2016	2017	2018
Annual Mean NO₂ (µg/m³)					
Caversham Rd (RD1)	41	38	39	37	40
Oxford Rd (RD3)	35	31	30	28	28
London Rd (RD4)	-	-	32	28	30
Number of Predicted Exceedances of the 1-Hour Mean AQO of 200 µg/m³					
Caversham Rd (RD1)	0	1	0	0	7
Oxford Rd (RD3)	0	0	0	1	0
London Rd (RD4)	-	-	0	0	0

¹⁴ Reading County Council Air Quality Annual Status Report for 2018, June 2019

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Table 4: Automatically Measured PM₁₀ Concentrations.

Site Name	2014	2015	2016	2017	2018
Annual Mean PM10 (µg/m³)					
Caversham Rd (RD1)	33	28	20	23	24
Oxford Rd (RD3)	20	23	22	21	23
London Rd (RD4)			19	18	17
Number of Predicted Exceedances of the 24-Hour Mean AQO of 50 µg/m³					
Caversham Rd (RD1)	31	8	5	7	3
Oxford Rd (RD3)	3	7	3	8	2
London Rd (RD4)	-	-	2	3	1

Reading Borough Council also undertake monitoring of nitrogen dioxide concentrations at 56 locations using passive diffusion tubes. Details and locations of the tubes (x6) closest to the proposed development are shown in Table 5.

Table 5: Diffusion Tube Monitoring Locations.

Site Name	Type	Easting	Northing
DT33 165 Oxford Road	Roadside	470717	173373
DT17 4 Tilehurst Road	Roadside	470628	173076
DT18 162a Castle Hill	Roadside	470835	172992
DT34 10 Trinity Place	Roadside	470738	173433
DT35 Picture House	Roadside	471113	173487
DT32 281 Oxford Road	Roadside	470294	173445

A summary of annual mean NO₂ concentrations measured at these diffusion tubes is presented in Table 6 below. With the exception of DT20 in 2015, the concentrations measured at roadside locations in the area have been well within the annual mean air quality objective for the last four years.

The proposed development is located approximately 210m from the nearest heavily trafficked road (A33), 25m from Chatham Street to the north and 90m from Oxford Road to the south which is also heavily congested. Tubes DT32 and DT33 are located close to the proposed development and have measured annual mean NO₂ concentrations that are generally above the objective. Location of diffusion tubes are shown in Figure 3 overleaf.

Table 6: Diffusion Tube Monitoring NO₂ Results.

Site ID	Type	2014	2015	2016	2017	2018
DT33	Roadside	51	47	44	47	42
DT17	Roadside	35	29	30	30	29
DT18	Roadside	40	36	37	35	35
DT34	Roadside	32	31	31	29	32

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DT35	Roadside	34	30	32	30	31
DT32	Roadside	48	45	44	45	42

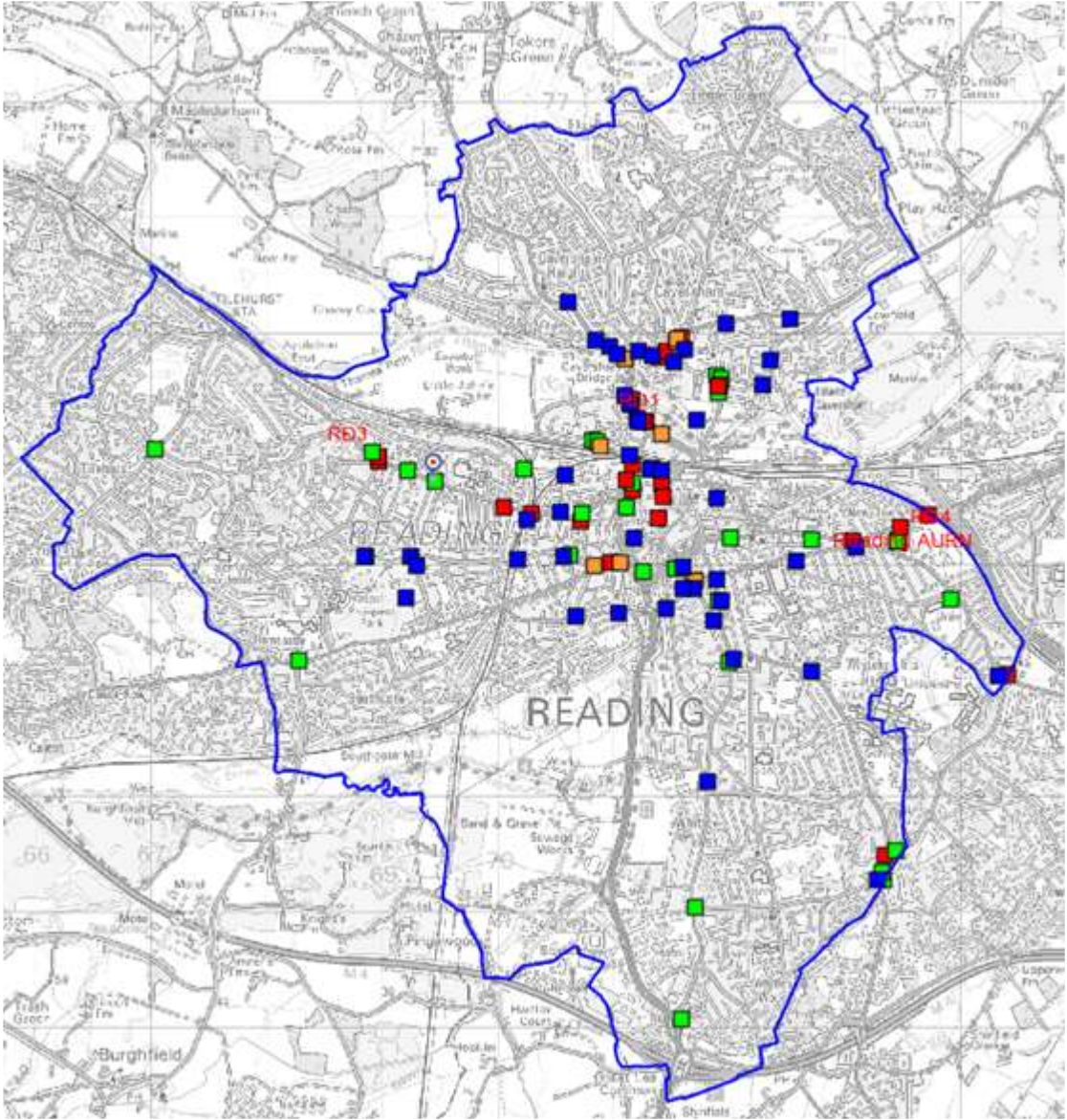


Figure 3: Location of air quality monitoring sites.

POTENTIAL IMPACTS

The potential impacts and significance of these impacts on air quality during the construction and operational phases of the development are identified in this section. Suggested mitigation measures are outlined in a subsequent section of the report.

CONSTRUCTION DUST

SENSITIVITY OF THE AREA TO DUST IMPACTS

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the site boundary. A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in **Error! Reference source not found..** The sensitivity of the area to health impacts is dependent on the existing PM10 concentration. Based on current local monitoring data close to the site, it is considered unlikely that roadside PM10 concentrations will be above 24 µg/m3.

Table 7: Sensitivity of Receptors and the Local Area to Health and Dust Soiling Impacts.

Receptor	Distance from Site Boundary	Number of Receptors	Sensitivity to Health Impacts (a)		Sensitivity to Dust Soiling Impacts	
			Receptor	Area	Receptor	Area
Residential Properties including various hotels Travelodge, The Penthouse, Stawi Serviced Apartments	< 20 m	10 - 100	High	Low	High	High
	< 50 m	10 - 100		Low		Medium
	> 350 m	>100		Low		Low
Oxford Road Community School	>350m	>100	High	Low	Low	Low
Overall Sensitivity of the Area			Low		Low	
Existing annual mean PM ₁₀ concentration below 24 µg/m ³						

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

There are no dust sensitive habitat sites within 50m of the Site; therefore, impacts on ecology have not been considered in the assessment.

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A wind rose from Reading University, Whiteknights Weather station is presented in Figure 4 which shows that the prevailing wind is from the SW approximately 2km from the site, therefore receptors to the northeast of the site are most likely to experience dust impacts during the construction phase.

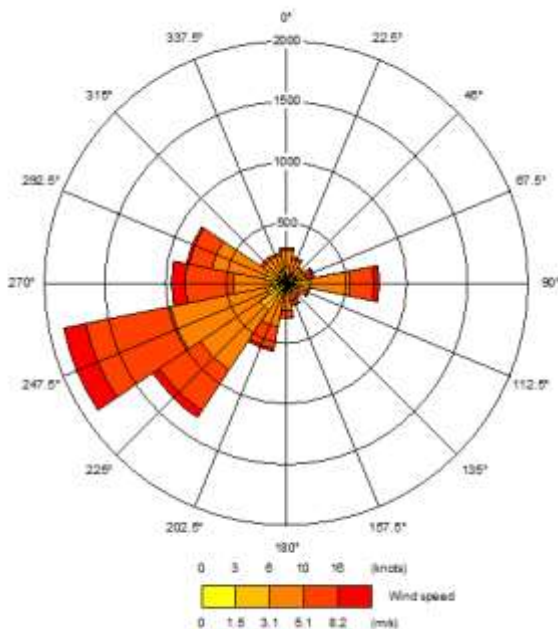


Figure 4: Wind Rose Reading University.

DUST EMISSION MAGNITUDE

The magnitude of the likely dust emission from earthworks, construction and track out, has been evaluated using the criteria in Table A of Appendix A and is presented in Table 8.

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Table 8 Evaluation of Dust Emission Magnitude.

Dust Source	IAQM Criteria	Proposed Development	Dust Emission Magnitude
Demolition	Will any demolition be required on site?	Yes	Small
	Volume of buildings to be demolished (m ³)	< 20,000m ³	Small
	Height of buildings to be demolished (m)	8m	Small
	Will crushing/ screening be undertaken on site?	Yes	Small
	Timing of demolition phase (e.g., March to June)	Q2 2021	Medium
Overall Dust Emission Magnitude from Demolition			Small
Justification: n/a			
Earthworks	Total site area (m ²)	Approx. 1,623m ²	Small
	Total material moved (tonnes)	Unknown	Medium
	Soil type?	Unknown	Medium
	Number of heavy earth moving vehicles active at any one time	Unknown	Medium
	Maximum stockpile/ bund height	Unknown	Medium
Overall Dust Emission Magnitude from Earthworks			Medium
Justification: n/a			
Construction	Total building volume (m ³)	13,100m ³ (volume excludes undercroft parking)	Small
	Potentially dusty construction material?	Brick	Medium
	On-site concrete batching?	No	Small
	Sandblasting?	No	Small
Overall Dust Emission Magnitude from Construction			Small
Justification: n/a			
Trackout	Number of outward HGV movements in any one day	~ 25-30	Medium
	Unpaved road length (m)	Unknown	Small
Overall Dust Emission Magnitude from Trackout			Small

ASSESSMENT OF DUST RISK PRIOR TO MITIGATION

A summary of the potential risk of dust impacts prior to mitigation, based on the low sensitivity of the area to human health impacts and high sensitivity to dust soiling impacts is presented in **Error! Reference source not found..**

Table 9: Risk of Dust Impacts Prior to Mitigation.

Dust Source	Emission Magnitude	Human Health Risk	Dust Soiling Risk	Overall Risk
Demolition	Small	Low	Low	Low
Earthworks	Medium	Low	Low	Low
Construction	Small	Low	Low	Low
Trackout	Small	Low	Low	Low

MITIGATION

The following mitigation measures will be required during the construction and operational phases to minimise the air quality impacts arising from the development.

CONSTRUCTION PHASE

The IAQM Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as varying between small to medium from demolition, earthworks, construction activities and low from trackout, prior to mitigation. In accordance with the IAQM guidance, it is recommended that the 'highly recommended' and 'desirable' measures detailed in Table 10 and Table 11 are incorporated into the DMP.

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Table 10: Highly recommended mitigation measures.

Description	Mitigation Measure
Operating vehicle/machinery and sustainable travel	- Ensure all non-road vehicles comply with the requirements of the EUNRMM regulation 2016/1628, where applicable. - Ensure all vehicles switch off engines when stationary - no idling vehicles. - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable. - 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. - 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. - Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	- Avoid bonfires and burning of waste materials
Demolition	- Ensure effective water suppression is used during demolition operations. Handheld 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.
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.
Trackout	- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. - 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). - Access gates to be located at least 10m from receptors where possible.

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Table 11: Desirable mitigation measures.

Description	Mitigation Measure
Preparing and maintaining the site	- Plan site layout: machinery and dust causing activities should be located away from sensitive receptors such as the river to the east and residential units to the south - Fully enclosure 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	- Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Earthworks	- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces. - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil. - Only remove secure covers in small areas during work and not all at once.
Construction	- Avoid scabbling (roughening of concrete surfaces) if possible. - Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. - For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	- Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site. - Avoid dry sweeping of large areas. - Ensure vehicles entering and leaving sites are securely 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).

OPERATIONAL PHASE

During the operational phase of the proposed development, it is not expected to negatively affect local air quality, from both building-related and transport-related emissions as there is a net reduction in operational traffic following the development of the proposal. However, the following mitigation measures will be implemented to minimise any potential vehicle trips associated with the development:

- A transport statement will be provided as part of the application.
- 32 cycle spaces have been proposed as part of the development.
- 4 electric vehicle charging points will be provided as part of the development.

SUMMARY AND CONCLUSIONS

An assessment of the potential impacts during the construction phase has been carried out in accordance with the latest Institute of Air Quality Management guidance; this has shown that releases of dust and PM₁₀ are likely to occur during site activities. However, through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM₁₀ releases may be effectively mitigated and the resultant impacts are considered to be negligible.

Traffic generated during the operational phase is not anticipated to negatively affect local air quality. While there is not available information for a baseline scenario, there is anticipated to be a reduction in net traffic by 12 trips per day, 7 trips in the morning peak hours and 5 trips in the evening peak hours. A range of mitigation measures are proposed to minimise vehicle emissions associated with the site which includes the provision of 32 cycle storage spaces and 4 electric vehicle charging points.

The energy strategy for the proposed development is based on electric systems only.

A review of local monitoring data indicates that there is unlikely to be an exceedance of the long or short-term air quality standards for NO₂, PM₁₀ or PM_{2.5} at the site and therefore the proposed development will not create new exposure to poor air quality.

APPENDIX A – IAQM CONSTRUCTION DUST METHODOLOGY

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A.

Table A: Sensitivity factors.

Sensitivity	Human Health	Dust Soiling	Ecological
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	- Nationally or Internationally designated site with dust sensitive features (b) - Locations with vascular species (c)
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include office and shop workers (d)	- Short-term exposure - Moderate level of amenity expected. - Possible diminished appearance or aesthetics of property due to dust soiling. - Examples include parks and places of work	- Nationally designated site with dust sensitive features (b) - Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	- Transient human exposure - Examples include public footpaths, playing fields, parks and shopping streets	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	- Locally designated site with dust sensitive features (b)
a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day. b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete). c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee. d) Does not include workers' exposure to PM₁₀ as protection is covered by Health and Safety at Work legislation. e) Except commercially sensitive horticulture.			

AIR QUALITY ASSESSMENT

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM₁₀ concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts, respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property.

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

Table A3: Sensitivity of the Area to Health Impacts from Dust.

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration (µg/m ³)	Number of Receptors	Distance from the Source				
			<20m	<50m	<100m	<200m	<350m
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

AIR QUALITY ASSESSMENT

Table A4: Sensitivity of the Area to Ecological Impacts from Dust.

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

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Table A5: Dust Emission Magnitude.

Receptor Sensitivity	Large	Medium	Small
Demolition	- Total building volume >50,000m³ - Potentially dusty material (e.g. concrete) - Onsite crushing and screening - Demolition activities >20m above ground level.	- Total building volume 20,000 - 50,000m³ - Potentially dusty material - Demolition activities 10 - 20m above ground level.	- Total building volume <20,000m³ - Construction material with low potential for dust release - Demolition activities <10m above ground level - Demolition during wetter months
Earthworks	- Total site area >10,000m² - Potentially dusty soil type (e.g. clay) - >10 heavy earth moving vehicles active at any one time - Formation of bunds >8m in height - Total material moved >100,000 tonnes	- Total site area 2,500 - 10,000m² - Moderately dusty soil type (e.g. silt) - 10 heavy earth moving vehicles active at any one time - Formation of bunds 4 - 8m in height - Total material moved 20,000 - 100,000 tonnes	- Total site area <2,500m² - Soil type with large grain size (e.g. sand) - <5 heavy earth moving vehicles active at any one time - Formation of bunds <4m in height - Total material moved <20,000 tonnes - Earthworks during wetter months
Construction	- Total building volume >100,000m³ - On site concrete batching - Sandblasting	- Total building volume 25,000 - 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching	- Total building volume <25,000m³ - Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	- >50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	- 10 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m	- <10 HGV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m

AIR QUALITY ASSESSMENT

Receptor Sensitivity	Large	Medium	Small
a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes			

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6 and A7.

Table A6: Risk of Dust Impacts from Demolition, Earthworks and Construction.

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

Table A7: Risk of Dust Impacts from Trackout.

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

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