

AIR QUALITY ASSESSMENT

on behalf of

IQ STUDENT ACCOMMODATION

for

ECHO STREET, MANCHESTER, M1 3QJ

REPORT DATE: 23 MARCH 2023

REPORT NUMBER: 101532-3

Miller Goodall Ltd
Ground Floor
Ashworth House
Deakins Business Park
Blackburn Road
Egerton
Bolton
Lancashire
BL7 9RP

Tel: 01204 596166

www.millergoodall.co.uk

Company registration number 5201673

Summary

This air quality report has been prepared to accompany a planning application for purpose built student accommodation at Echo Street, Manchester, M1 3QJ.

This report provides an assessment of the impacts of dust from construction activities following the guidance from the Institute of Air Quality Management which has been used to inform the Construction Environmental Management Plan (CEMP) for the Proposed Scheme.

It also provides a review of existing air quality in proximity to the Site and assesses the suitability of the Proposed Scheme for its intended use following Local Air Quality Management Technical Guidance and EPUK and IAQM guidance.

With the implementation of NO_x filters installed in some rooms on the second, third and fourth-floor levels of the Proposed Scheme, concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives within the Proposed Scheme. Concentrations of PM_{2.5} are expected to be below the annual mean target. The proposed Scheme is therefore considered suitable for student accommodation with regard to air quality.

Prepared By Melody Horan

Reviewed By

Lesley Goodall

Signed


23 March 2023

Signed


23 March 2023

Record of changes

Version	Date	Change	Initials
Draft	10 March 2023	First issue	MH
1	23 March 2023	Minor changes after draft review	MH

Contents

Summary	1
Contents	0
1 Introduction.....	1
2 Site Description	1
3 Proposed Development	1
4 Policy Context	2
4.1 Air Quality Objectives	2
5 Methodology	3
5.1 Data Sources	3
5.2 Consultation	3
5.3 Construction Dust Assessment	4
5.4 Air Quality Assessment	4
6 Baseline Air Quality	4
6.1 Local Air Quality	4
6.2 Air Quality Monitoring	5
6.3 Defra Background Concentrations	6
7 Construction Dust Impact Assessment	7
7.1 Step 1 – Requirement for a Detailed Assessment.....	7
7.2 Step 2 – Assess the Risk of Dust Impacts	7
7.3 Step 3 – Site-Specific Mitigation.....	8
7.4 Step 4 – Determine Significant Effects.....	9
8 Effect of Air Quality on the Proposed Development.....	9
9 Mitigation.....	9
10 Summary of Impacts and Conclusion	9
APPENDICES	11
Glossary of Terms	30

1 Introduction

- 1.1 Miller Goodall Ltd has been instructed to prepare an air quality assessment to accompany a planning application for the Proposed Scheme of purpose built student accommodation at Echo Street, Manchester, M1 3QJ. The site lies within the administrative boundary of Manchester City Council (MCC).
- 1.2 This report provides an assessment of the impacts of dust from construction activities following the guidance from the Institute of Air Quality Management¹ which has been used to inform the Construction Environmental Management Plan (CEMP) for the Proposed Scheme.
- 1.3 It also provides a review of existing air quality in proximity to the Site and assesses the suitability of the Proposed Scheme for its intended use following Local Air Quality Management Technical Guidance² and EPUK and IAQM guidance³.

2 Site Description

- 2.1 The Site is located within Manchester City Centre. Student accommodation and commercial premises are located to the north of the Site. The A6 is the closest A-road to the Site and is located approximately 50 m east of the Site. The railway line between Manchester Piccadilly and Manchester Oxford Road stations is located to the south of the Site. Vimto Park is located to the west of the Site.
- 2.2 The site is located in an Air Quality Management Area (AQMA) which covers a large proportion of Manchester city centre. The site location and AQMA is shown in **Appendix A**.

3 Proposed Development

- 3.1 The Proposed Scheme is the development of purpose-built student accommodation (sui generis) comprising 3 interlinked tower blocks with intermediary linking block buildings, associated amenity space and external landscaping. There will be 1,224 student accommodation units and the Proposed Scheme will be car-free and provide no on-site car parking. As part of improvements to the public realm, there will be a reconfiguration of the existing on-street public parking bays on Granby Row and their number will reduce from thirteen to eight. Two of the spaces will be wheelchair-accessible spaces. The spaces will remain as pay and display. Cycle parking for the Proposed Scheme will be provided within a secure and covered cycle store. 313 long-stay cycle spaces will be provided. Short-stay cycle spaces will also be provided with Sheffield stands within the public realm.
- 3.2 The building is being proposed as an all-electric building, with wall mounted electric panel heaters and high levels of insulation. The communal areas at ground floor level will be served by an air source heat pump simultaneous heating and cooling Variable Refrigerant Volume system. The escape lobby and corridor areas will be served by

¹ IAQM (2014). Assessment of dust from demolition and construction v1.1 Available at [air-quality-planning-guidance.pdf \(iaqm.co.uk\)](https://www.iaqm.co.uk/air-quality-planning-guidance.pdf).

² Department for the Environment Food and Rural Affairs (2018) 'Local Air Quality Management Technical Guidance Document LAQM.TG (22)', London: Defra.

³ EPUK and IAQM (January 2017) Land Use Planning and Development Control: Planning for Air Quality (v1.2)

a wet heating system to be compliant with BS7671 Requirements for Electrical Installations. The heat for the wet system will be generated via an air source heat pump technology with distribution pipework.

- 3.3 The only combustion equipment as part of the Proposed Scheme will be the diesel generator and pumps located within the basement. This will be for emergency use and tested on a monthly basis (exhausts will terminate at basement level).

4 Policy Context

4.1 Air Quality Objectives

- 4.1.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.
- 4.1.2 The United Kingdom left the European Union on 31st January 2020 and is no longer a member state. However, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018^[4].
- 4.1.3 The relevant air quality standards and objectives are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health.

Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management

Pollutant	Air Quality Objective	
	Concentration	Measured As
Nitrogen dioxide (NO ₂)	200 µg/m ³	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m ³	Annual mean
Particles (PM ₁₀)	50 µg/m ³	24-hour mean not to be exceeded more than 35 per year
	40 µg/m ³	Annual mean
Particles (PM _{2.5})	25 µg/m ³	Annual mean (target)

- 4.1.4 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as AQMAs and take action to work towards meeting the objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

⁴ UK Parliament (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

- 4.1.5 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

5 Methodology

5.1 Data Sources

- 5.1.1 The air quality assessment has been undertaken and prepared with reference to information from several sources, as detailed in **Table 2**.

Table 2: Key Information Sources

Data Source	Reference
Greater Manchester Combined Authority (GMCA)	GMCA (2022) <i>2021 Air Quality Annual Status Report for Greater Manchester</i> GMCA Clean Air Greater Manchester (website)
Department for Environment Food and Rural Affairs (Defra)	Defra <i>Local Air Quality Management Technical Guidance TG(22)</i> , updated 2022
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) <i>Land Use Planning and Development Control: Planning for Air Quality (v1.2)</i>
Ministry of Housing, Communities & Local Government	Planning Practice Guidance: Air Quality, November 2019 National Planning Policy Framework (NPPF), July 2021
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps

5.2 Consultation

- 5.2.1 The proposed air quality assessment methodology and mitigation for the Proposed Scheme were discussed and agreed with Laura Miller (Environmental Protection Officer) of MCC⁵ during the scoping exercise undertaken for the Environmental Impact Assessment (EIA) for the Proposed Scheme. It was agreed that, based on the technical baseline and understanding of the Proposed Scheme (Chapter 4 of the Environmental Statement (ES) accompanying the planning application), the following effects are considered unlikely to be significant and therefore have not been considered within the EIA or reported in the ES;

- Changes to local air quality as a result of emissions from construction traffic;

⁵ Email Miller Goodall Ltd. to Environmental Health (MCC), 30 January 2023. Email Laura Miller (MCC) to Miller Goodall Ltd. on 3rd February 2023.

- Changes to local air quality as a result of emissions from construction related non-road mobile machinery;
- Nuisance and disturbance as a result of dust from construction activities ;
- Changes to local air quality as a result of emissions from operational traffic; and
- Combustion emissions during the operation of the development.

5.2.2 This was agreed that an assessment of the impacts of dust associated with construction activities would be undertaken to inform the CEMP for the Proposed Scheme and that the suitability of the Site for student accommodation would be considered.

5.3 Construction Dust Assessment

5.3.1 The Institute of Air Quality Management (IAQM) provide guidance on the assessment of air quality impacts arising from construction activities and has been used in this assessment. This section follows a risk assessment to determine the likely impact of the Proposed Scheme on nearby receptor locations during the construction phase and goes on to recommend mitigation measures that should be implemented to reduce any impact. The methodology for the assessment is shown in **Appendix B**. The study area in relation to the construction dust and the areas within less than 20 m, 20 m – 50 m and 50 – 100 m from the Site are shown in **Appendix C**. The nearest receptors, and those most at risk, are located within 20 m of construction activities.

5.4 Air Quality Assessment

5.4.1 A simple assessment of air quality to assess the suitability of the Site for student accommodation, which relies on already published information, has been completed using sources such as the Local Authority's monitoring network and the Defra LAQM support tools and the EIA and ES for a previous planning application which was submitted for the Site in 2017⁶.

6 Baseline Air Quality

6.1 Local Air Quality

6.1.1 Baseline air quality at the Site has been established by examining monitoring data produced by MCC (provided in the 2021 GMCA Annual Status Report) and background concentration maps provided by Defra for the grid squares covering the Site.

6.1.2 The Site is located within an AQMA. The Greater Manchester AQMA has been declared based on the outputs of air dispersion 2016 modelling. All locations across Greater Manchester that were predicted to be above an NO₂ annual mean of 35 µg/m³ were declared as part of the AQMA. The annual mean objective is 40 µg/m³, the selection of 35 µg/m³ as the threshold was selected to account for model uncertainty.

⁶ MCC Ref: 18267/FO/2017. Approved in June 2018.

6.2 Air Quality Monitoring

Nitrogen Dioxide (NO₂)

6.2.1 MCC monitors NO₂ at two automatic monitoring stations and four diffusion tube locations, two of which are triplicate tubes, within 700 m of the Site.

6.2.2 The results from the diffusion tube are shown in **Table 3** and the monitor locations are shown in **Appendix A**.

Table 3: Annual Mean NO₂ Concentrations Monitored by MCC

Site ID & Classification	Location	Annual Mean NO ₂ Concentrations (µg/m ³)				
		2017	2018	2019	2020	2021
Oxford Road (Kerbside)	384233, 397287	65	62	59	36	44
Manchester Piccadilly (Urban Centre)	384310, 398337	36	35	36	27	30
MAN72 Lockton Close (Urban background)	384761, 397384	34.6	33.4	32.8	24.5	27.5
MAN82-MAN 84 Oxford Rd co-located tubes (Roadside)	384239, 397276	56.2	54.0	52.0	33.9	40.7
MAN59-61 Manchester Piccadilly co-located tubes (Urban background)	384310, 398337	35.7	31.6	33.1	22.3	24.6
MAN29 A (Roadside)	384119, 397503	57.7	58.8	55.4	39.0	44.8
Annual Mean NO ₂ air quality objective					40 µg/m ³	

6.2.3 The monitoring results in **Table 3** indicate that annual mean concentrations of NO₂ range from below the annual average air quality objective to well above it depending on proximity to road traffic emissions. 2020 results show the impact of Covid-19 and reduced traffic flows. In 2021, when lockdown restrictions began to be lifted in earnest, concentrations increased at all sites, although did not rise as high as concentrations measured in 2019.

Particulate Matter (PM₁₀ & PM_{2.5})

6.2.4 MCC monitors PM₁₀ at two automatic monitoring stations, Oxford Road and Manchester Piccadilly, within 700 m of the Site. The Manchester Piccadilly automatic monitoring station also monitors PM_{2.5} concentrations. The results from the monitoring station are shown in **Table 4** and **Table 5**; the locations of the monitors are shown in **Appendix A**.

Table 4: Annual Mean PM₁₀ Concentrations Monitored by MCC

Site ID & Classification	Location	Annual Mean NO ₂ Concentrations (µg/m ³)				
		2017	2018	2019	2020	2021
Oxford Road (Kerbside)	384233 397287	27	30	26	18	18
Manchester Piccadilly (Urban Centre)	384310 398337	20	21	20	15	15
Annual Mean PM ₁₀ air quality objective					40 µg/m ³	

Table 5: Annual Mean PM_{2.5} Concentrations Monitored by MCC

Site ID & Classification	Location	Annual Mean NO ₂ Concentrations (µg/m ³)				
		2017	2018	2019	2020	2021
Manchester Piccadilly (Urban Centre)	384310 398337	8	11	12	8	9
PM _{2.5} Target Level					25 µg/m ³	

6.2.5 The results indicate that since 2017 the PM₁₀ annual mean objective has not been exceeded at either automatic monitoring station and the PM_{2.5} concentrations at Manchester Piccadilly are below the PM_{2.5} target level.

6.3 Defra Background Concentrations

6.3.1 Background concentrations of NO₂, PM₁₀ and PM_{2.5} obtained from the background concentration maps provided by Defra for the grid squares covering the Site⁷ are shown in **Table 6**.

Table 6: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site*

Grid Square	Pollutant	2019	2023
		(µg/m ³)	(µg/m ³)
384500, 397500	NO ₂	28.25	23.95
	PM ₁₀	14.38	13.67
	PM _{2.5}	9.13	8.64
384500, 398500	NO ₂	29.31	25.53
	PM ₁₀	13.60	12.92
	PM _{2.5}	8.78	8.29

* Background concentrations obtained from the latest 2018 based background maps

⁷ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

7 Construction Dust Impact Assessment

7.1 Step 1 – Requirement for a Detailed Assessment

- 7.1.1 There are sensitive receptors located within 350m of the site boundary, therefore, a detailed assessment of the construction phase of the development has been undertaken. There are no ecological designations within 50m of the site boundary or trackout routes which require assessment.

7.2 Step 2 – Assess the Risk of Dust Impacts

Step 2A Dust Emission Magnitude

- 7.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table B1** in **Appendix B**. The scale and nature of works onsite were considered to determine the potential dust emission magnitude for earthwork activities, construction and trackout activities. No demolition is required at the development site.
- 7.2.2 Information to determine the classification has been estimated from the site plans, Google Earth and information provided by the Applicant. The dust emission magnitude is outlined in **Table 7**.

Table 7: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitudes	Justification for Sensitivity Classification
Earthworks	Medium	the site area is between 2,500 m² – 10,000 m²
Construction	Large	total building volume estimated to be constructed is greater than 100,000 m³
Trackout	Small	there are likely to be more than 50 HDV outward movements in any one day

Step 2B Sensitivity of the Receptors to Dust Soiling and Health Effects

- 7.2.3 Student accommodation is located to the north of the Site within a distance of 20 m from earthworks and construction, and 20 m of road edges used by traffic associated with the site construction. In accordance with the criteria in **Table B2** in **Appendix B** and the IAQM guidance, the sensitivity of human receptors is **high**.

Step 2B Sensitivity of the Area to Dust Soiling and Human Health Effects of PM₁₀

- 7.2.4 The sensitivity of the area for dust soiling and human health effects has been determined using the criteria detailed in **Table B3** and **Table B4** respectively in **Appendix B**.
- 7.2.5 The sensitivity of the area to dust soiling and human health for each activity is summarised in **Table 8**.

Table 8: Outcome of Defining the Sensitivity of the Area

Pollution	Activity	Sensitivity of the Surrounding Area	Justification for Sensitivity Classification
Dust Soiling	Earthworks	High	There are more than 100 highly sensitive receptors within 20 m of the site boundary.
	Construction	High	There are more than 100 highly sensitive receptors within 20 m of construction activity.
	Trackout	High	There are more than 100 highly sensitive receptors within 20 m of roads which relevant vehicles are likely to use that are up to 500 m from the site.
Human Health	Earthworks	Medium	There are more than 100 highly sensitive receptors within 20 m of the site boundary. Background PM ₁₀ concentrations are below 24 µg/m ³ .
	Construction	Medium	There are more than 100 highly sensitive receptors within 20 m of construction activity. Background PM ₁₀ concentrations are below 24 µg/m ³ .
	Trackout	Medium	There are more than 100 highly sensitive receptors within 20 m of roads which relevant vehicles are likely to use that are up to 500 m from the site. Background PM ₁₀ concentrations are below 24 µg/m ³ .

Step 2C Risk of Impacts

- 7.2.6 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts have been determined using the criteria detailed in **Table B5** to **Table B8** in **Appendix B**.
- 7.2.7 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 9**.

Table 9: Risk of Dust Impacts

Potential Impact	Dust Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Medium	High	High
Human Health	Medium	Medium	Medium

7.3 Step 3 – Site-Specific Mitigation

- 7.3.1 Step 3 of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Mitigation measures specific to earthworks, construction and trackout are proposed based on the risk classifications in **Table 9**. Recommended mitigation measures are shown in **Appendix D**.

- 7.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'high risk' classification (in this instance the site is classified as "high" risk due to construction and trackout)⁸.

7.4 Step 4 – Determine Significant Effects

- 7.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the mitigation measures, therefore, the residual impacts from the construction are considered to be not significant when considered following IAQM guidance.

8 Effect of Air Quality on the Proposed Development

- 8.1 Within the 2017 ES, the effect of emissions from diesel trains travelling along the railway line adjacent to the Site and the effect of emissions from nearby road traffic sources on the Proposed Scheme were considered i.e., the suitability of the Site for its intended use was assessed.
- 8.2 The detailed dispersion modelling undertaken indicated that the railway could cause certain locations within the Proposed Scheme to be close to or to exceed the annual mean NO₂ objective at the façade of some of the lower floors. It was, therefore, recommended that NO_x filters be installed in some rooms on the second, third and fourth-floor levels, to ensure future residents of the Proposed Scheme are not exposed to poor air quality. These primary mitigation measures were considered an integral part of the Proposed Scheme and with this primary mitigation in place, the effect of local air quality on the development is not considered to be significant.
- 8.3 Defra background concentrations and MCC monitoring indicate that air quality has improved within MCC since 2017 and, thus the 2017 assessment presents a worst case assessment of air quality at the Proposed Scheme. The 2017 assessment, therefore, remains valid and an updated air quality assessment has not been completed.

9 Mitigation

- 9.1 NO_x filters will be installed in some rooms on the second, third and fourth-floor levels of the Proposed Scheme to ensure future residents of the Proposed Scheme are not exposed to poor air quality. The locations for these are shown in **Appendix E**. These primary mitigation measures would be considered an integral part of the Proposed Scheme and with this primary mitigation in place, the effect of local air quality on the Proposed Scheme is not considered to be significant. If the railway line is fully electrified and no longer has diesel passenger trains before the development is built, then the NO_x filters will not be necessary.

10 Summary of Impacts and Conclusion

- 10.1 This air quality report assesses the site suitability of the Proposed Scheme for its intended use.

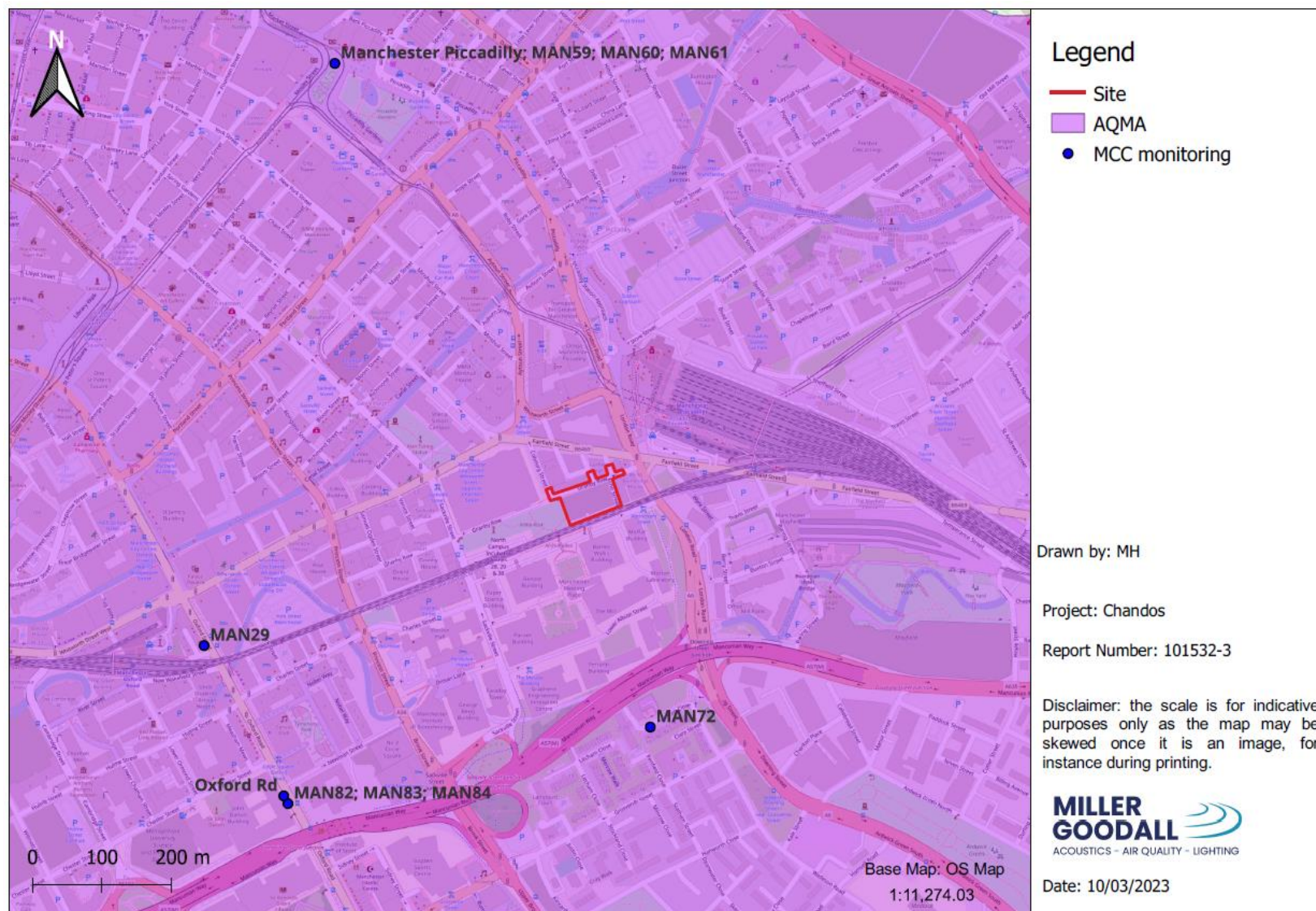
⁸ For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for demolition and track-out, the general measures applicable to a high risk site should be applied.

10.2 With the implementation of NO_x filters installed in some rooms on the second, third and fourth-floor levels, concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives at the proposed development site which is therefore considered suitable for student accommodation with regards to air quality. Concentrations of PM_{2.5} are expected to be below the annual mean target.

APPENDICES

This page is left blank intentionally

Appendix A: Location of site, AQMA and MCC monitoring



This page is left blank intentionally

Appendix B: IAQM Dust Risk Assessment Methodology

The following section outlines criteria developed by the IAQM for the assessment of air quality impacts arising from construction and demolition activities¹. The assessment procedure is divided into four steps and is summarised below:

Step 1: Screen the Need for a Detailed Assessment

An assessment will normally be required where there are human receptors within 350 m of the site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s). Ecological receptors within 50 m of the site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), are also identified at this stage. An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects will not be significant.

Step 2: Assess the Risk of Dust Impacts

In step two, a site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the IAQM (construction, demolition, earthworks and trackout). A site can be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

Step 2A: Define the Potential Dust Emission Magnitude

Dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium or Large. The IAQM guidance recommends that the dust emission magnitude is determined separately for demolition, earthworks, construction and trackout. **Table B1** describes the potential dust emission class criteria for each outlined activity.

Table B1: Criteria Used in the Determination of Dust Emission Magnitude

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <20,000 m ³ , construction materials with low potential for dust release.	Total building volume 20,000 m ³ – 50,000 m ³ , potential dusty construction material.	Total building volume >50,000 m ³ , potentially dusty construction material.
Earthworks	Total site area <2,500 m ² , soil type with large grain	Total site area 2,500 – 10,000 m ² , moderately dusty soil type	Total site area >10,000 m ² , potentially dusty soil type
Construction	Total building volume <25,000 m ³ .	Total building volume 25,000 – 100,000 m ³ .	Total building volume >100,000 m ³ .

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Trackout	<10 outward HDV trips in any one day. Unpaved road length <50 m.	10-50 outward HDV trips in any one day. Unpaved road length 50-100 m.	>50 outward HDV trips in any one day. Unpaved road length >100 m.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM₁₀ concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

The criteria detailed in **Table B2** is used to determine the sensitivity of the receptor in relation to dust soiling, health effects and ecological effects.

Table B2: Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM ₁₀	Ecological Sites
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes	International or national designation <i>and</i> the features may be affected by dust soiling
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM ₁₀	Presence of an important plant species where dust sensitivity is uncertain or locations with a national designation with features that may be affected by dust deposition
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Local designation where features may be affected by dust deposition

Table B3 and **Table B4** are then used to define the sensitivity of the area to dust soiling and human health effects. This should be derived for each of construction, demolition, earthworks and trackout.

Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property.

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

Receptor Sensitivity	Number of Receptors	Distance from Source (m)*			
		<20	<50	<100	<350
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

*Distances considered are to the dust source

Table B4: Sensitivity of the Area to Human Health Impacts

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

The sensitivity of the area is then summarised.

Step 2C Define the Risks of Impacts

The dust emission magnitude from **Table B1** and sensitivity of the area and receptors from **Table B2**, **Table B3** and **Table B4** are combined, and the risk of impacts from each activity (demolition, earthworks, construction and trackout) before mitigation is applied, is determined using the criteria detailed in **Table B5** to **Table B8**.

Table B5: Risk of Dust Impacts - Demolition

Potential Impact Sensitivity of the Area	Dust 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

Table B6: Risk of Dust Impacts- Earthworks

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table B7: Risk of Dust Impacts- Construction

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table B8: Risk of Dust Impacts- Trackout

Potential Sensitivity of the Area	Impact of the	Dust Emission Magnitude		
		Large	Medium	Small
High		High Risk	Medium Risk	Low Risk
Medium		Medium Risk	Low Risk	Negligible
Low		Low Risk	Low Risk	Negligible

Step 3 Determine Site Specific Mitigation

Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

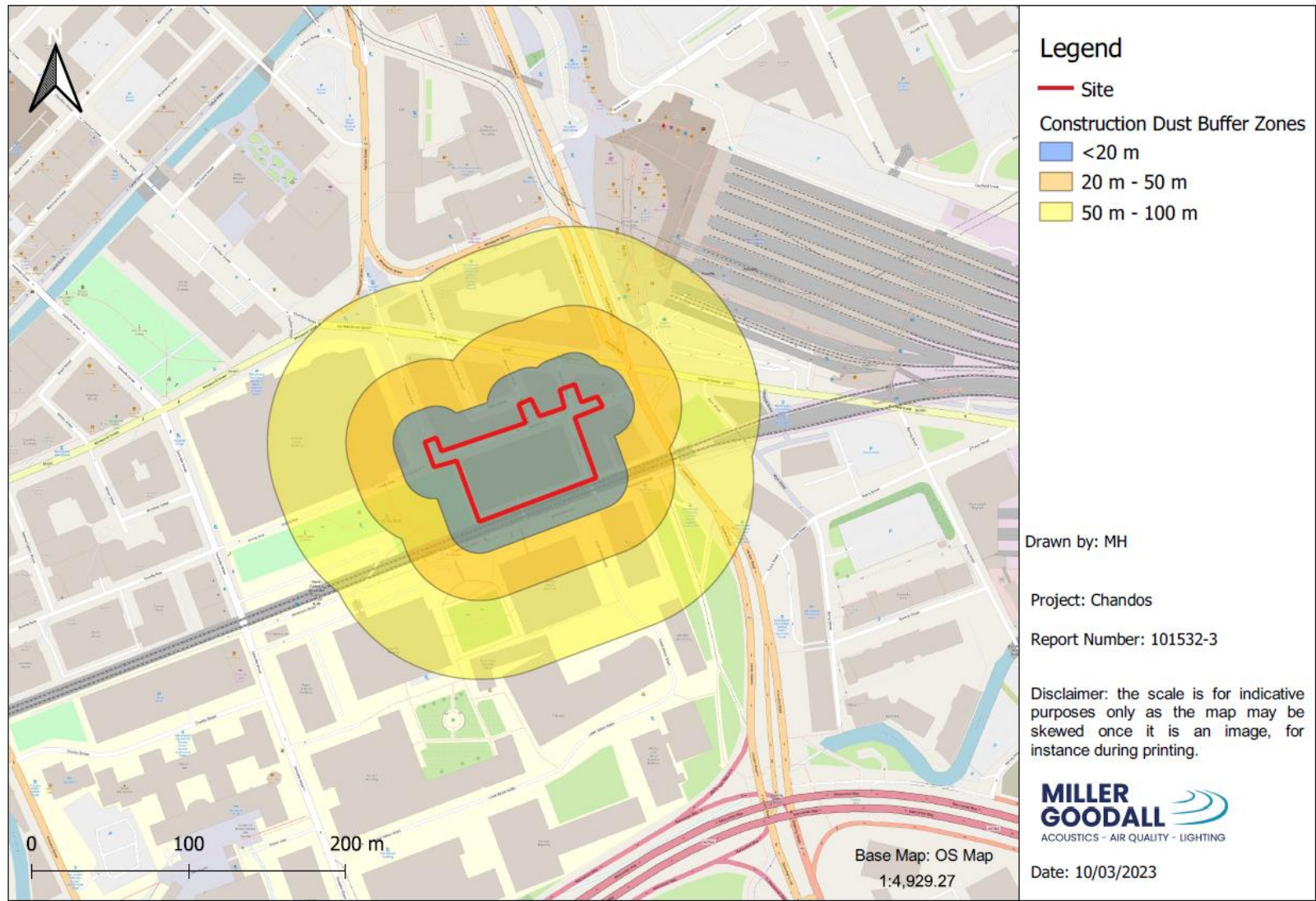
Step 4 Determine Significance of Residual Effects

At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

This page is left blank intentionally

Appendix C: Construction Dust Buffer Zones



This page is left blank intentionally

Appendix D: IAQM Dust Assessment Mitigation

xx Highly Recommended

x Desirable

Measures relevant for demolition, earthworks, construction and trackout

Mitigation Measure	High Risk
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	xx
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	xx
Display the head or regional office contact information.	xx
Develop and implement a Dust Management Plan (DMP).	xx
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.	xx
Make the complaints log available to the local authority when asked.	xx
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	xx
Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	xx
Monitoring	
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	xx
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	xx
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.	xx
If requested by the Local Authority: Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the Local Authority; where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	xx
Preparing and maintaining the site	
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	xx
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	xx
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	xx
Avoid site runoff of water or mud.	xx

Keep site fencing, barriers and scaffolding clean using wet methods.	xx
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.	xx
Cover, seed or fence stockpiles to prevent wind whipping.	xx
Operating vehicle/machinery and sustainable travel	
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	xx
Ensure all vehicles switch off engines when stationary - no idling vehicles.	xx
Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	xx
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads 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).	xx
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	xx
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	xx
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.	xx
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	xx
Use enclosed chutes and conveyors and covered skips.	xx
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	xx
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.	xx
Waste management	
Avoid bonfires and burning of waste materials.	xx

Measures specific to earthworks

Mitigation Measure	Medium Risk
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	x
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	x
Only remove the cover in small areas during work and not all at once.	x

Measures specific to construction

Mitigation Measure	High Risk
Avoid scabbling (roughening of concrete surfaces) if possible.	XX
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.	XX
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.	XX

Measures specific to trackout

Mitigation Measure	High Risk
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	XX
Avoid dry sweeping of large areas.	XX
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	XX
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable	XX
Record all inspections of haul routes and any subsequent action in a site log book.	XX
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	XX
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	XX
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	XX
Access gates to be located at least 10 m from receptors where possible.	XX

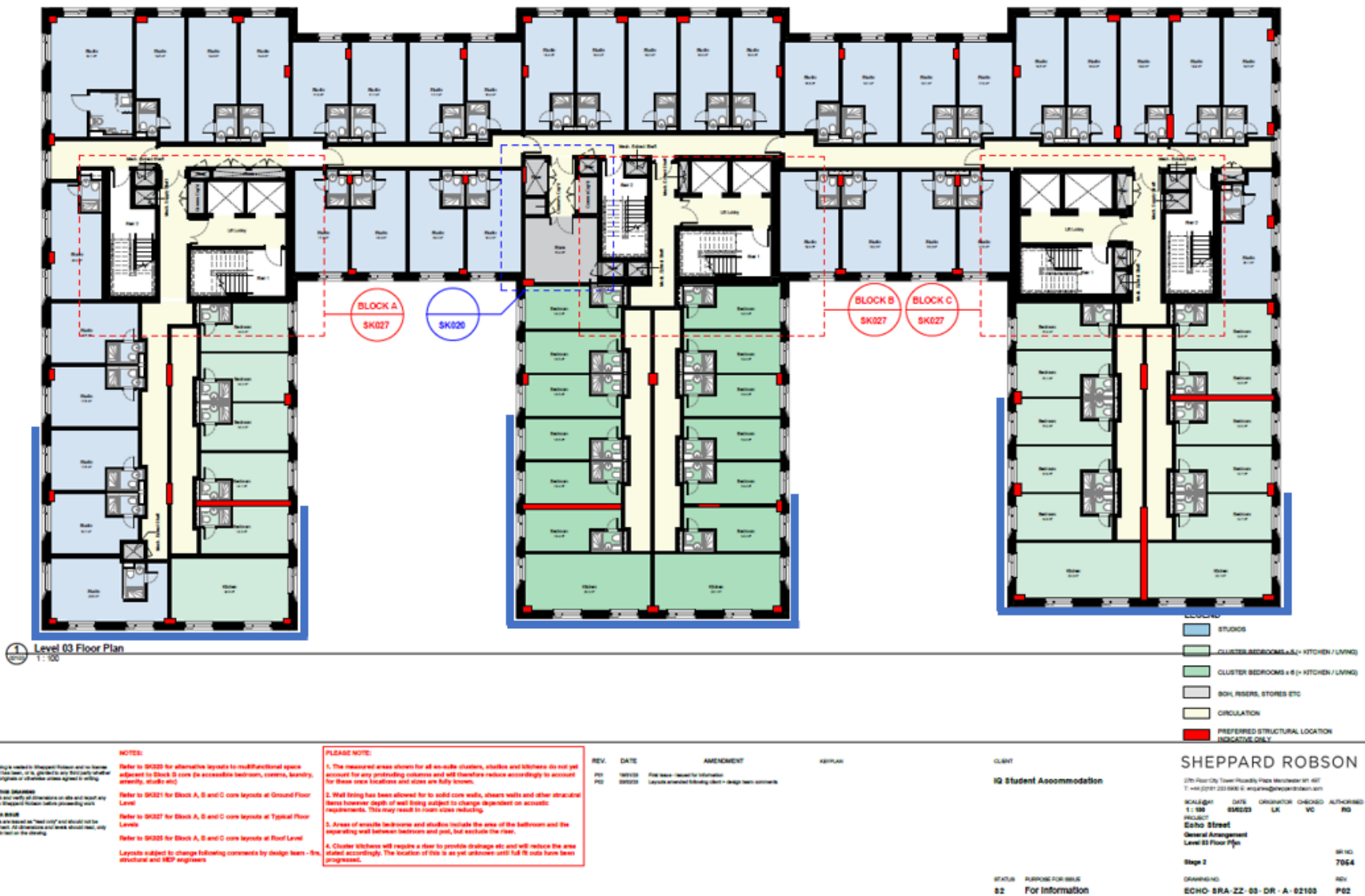
This page is left blank intentionally

Appendix E: NO_x Filter Locations (shown in blue)

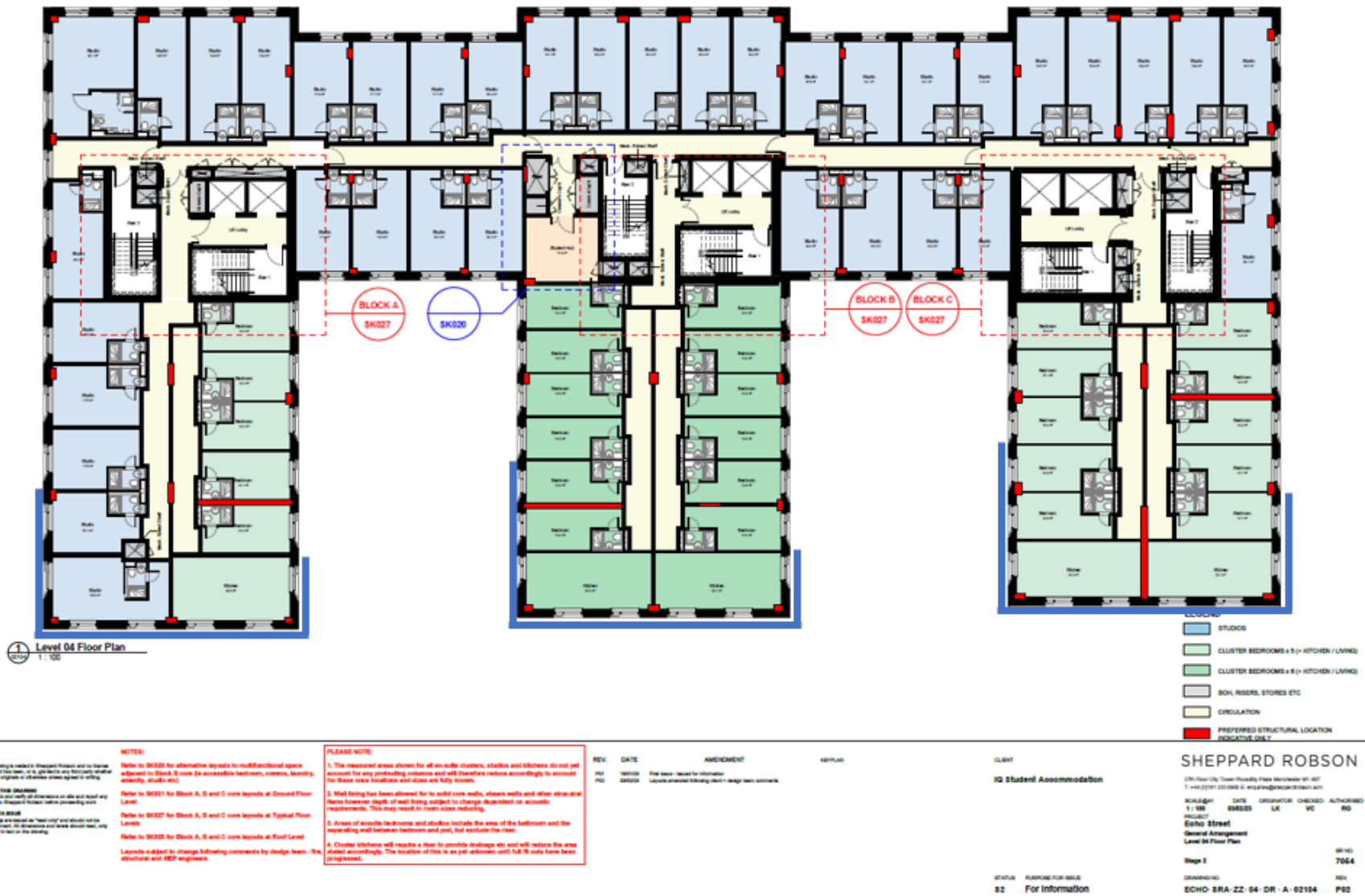
Second floor



Third floor



Fourth floor



Glossary of Terms

Air Quality Standard Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

Air Quality Objective Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

Annual Mean A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

- (a) in the case of lead, the mean of the daily levels for that year;
- (b) in the case of nitrogen dioxide, the mean of the hourly means for that year;
- (c) in the case of PM₁₀, the mean of the 24-hour means for that year.

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

AQS Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Background Concentrations The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

Defra Department for Environment, Food and Rural Affairs

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or mortality due to exposure to PM₁₀ or PM_{2.5} or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

EPUK Environmental Protection UK

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

LAQM Local Air Quality Management

Mg/m³ Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m³ means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

NO₂ Nitrogen Dioxide

NO_x A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO₂)

NPPF National Planning Policy Framework

Nuisance The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and use of his land.

Public nuisance, arising from an act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

PM_{2.5} The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM_{2.5}, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

PM₁₀ The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM₁₀, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

Running Annual Mean A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

