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ACOUSTIC AIR



J. J. Churchill, Station Road, Market Bosworth
Air Quality Assessment
March 2023

Report Ref: 23380-ENV-0402

J. J. Churchill, Station Road, Market Bosworth

Air Quality Assessment

March 2023

REPORT REF: 23380-ENV-0402

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REGISTRATION OF AMENDMENTS

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1.0 INTRODUCTION

- 1.1 Mewies Engineering Consultants Ltd (M-EC), has been commissioned by J. J. Churchill Limited (hereafter referred to as 'the Client') to undertake an Air Quality Assessment for a proposed commercial development at J. J. Churchill, Station Road, Market Bosworth (hereafter referred to as 'the Site').

Assessment Scope

- 1.2 The assessment has been undertaken with reference to the advice provided within the Land-Use Planning and Development Control: Planning for Air Quality, and 'Guidance from Environmental Protection UK, May 2017, and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes'.
- 1.3 In addition, a Construction Dust Risk Assessment has been undertaken in accordance with the 'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance' 2014.
- 1.4 A Site description is provided in Section 2.0 of this report. Air quality standards, including those applicable to the construction phase are summarised in Section 3.0, and a review of the Local Planning Authority's air quality review and assessments is presented in Section 4.0. The air quality assessment for the proposed development is presented in Section 5.0, and mitigation measures to offset developmental impacts are provided in Section 6.0. Our conclusions are presented in Section 7.0.

Disclaimer

- 1.5 M-EC has completed this report for the benefit of the individuals referred to in Paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from M-EC.
- 1.6 M-EC accepts no responsibility or liability for:
- a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
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2.0 SITE DESCRIPTION

Existing Site

- 2.1 The Site is within J. J. Churchill site that is located on Station Road, Market Bosworth. To the north of the Site is Station Road, to the east is existing commercial and industrial buildings and farmland, to the south is wood and farmland, to the west is the Battlefield Line and Market Bosworth Station.
- 2.2 There are a number of existing residential receptors along Station Road and a proposed residential development (currently under construction) to the west of the Battlefield Line.
- 2.3 An approximate redline boundary is presented in Figure 2.1.

Figure 2.1: Approximate Redline Boundary



Development Proposals

- 2.4 The development proposals comprise the erection of one commercial unit, that forms part of the J. J. Churchill Site, for class B8 usage with associated parking and infrastructure.
- 2.5 The proposed Site layout plan is provided in **Appendix A**.

3.0 AIR QUALITY STANDARDS

- 3.1 The principal air quality standards applied within the UK are the standards and objectives that were initially formulated within the Air Quality (England) Regulations 2000 (AQR) as amended in 2002. These were enacted as part of the UK National Air Quality Strategy (AQS) under Section 80 of the Environment Act 1995, and implement relevant directives of the European Union (EU). The latest version of the UK AQS was published in 2007.
- 3.2 It is important to note the distinction between air quality standards and objectives. Although the AQ Standards (AQS) define concentration levels that will avoid or minimise risks to health, they do not necessarily reflect levels that are presently technically feasible or economically efficient. In contrast, the AQ Objectives (AQO) have been set with regard to what is realistically achievable within a specified timetable. The approach adopted by the Strategy is to apply the objectives, where members of the public, in a non-occupational capacity and at locations close to ground level, are likely to be exposed over the averaging time of the objective, for example, over 1-hour, 24-hour or annual periods as appropriate.
- 3.3 Under the Environment Act 1995, Local Authorities must review and document local air quality within their areas by way of a staged appraisal and respond accordingly, with the aim of meeting the air quality objectives by the years defined in the Regulations. Where the objectives of the Regulations are not likely to be achieved by the objective year, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it will try to meet air quality standards in future.
- 3.4 The Strategy's current air quality objectives, for NO₂, PM₁₀ and PM_{2.5}, for the protection of human health are summarised in Table 3.1 below. Definitions of units and terms used to quantify air pollutant concentrations are provided in **Appendix B**.

Table 3.1: UK Air Quality Objectives for Protection of Human Health

Pollutant	Concentration	Measured as *
Nitrogen dioxide	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 gravimetric)		
All authorities	50 µg/m ³	Daily mean not to be exceeded more than 35 times a year
	40 µg/m ³	Annual mean
Particles (PM _{2.5} gravimetric)	25 µg/m ³ (target)	Annual mean
England only	Work towards reducing emissions/concentrations of fine particulate matter (PM _{2.5})	Annual mean

- 3.5 The UK Government has also set NO₂ objectives for 2010 that must be met by all member states, although these 2010 EU NO₂ objectives are equal to the UK Air Quality Strategy NO₂ 2005 objectives.

- 3.6 The pollutants of most concern to planning authorities in urban areas, due to the high concentrations presently encountered (of which local road traffic makes a large contribution) are NO₂ and PM₁₀.

National Planning Policy Framework

- 3.7 The latest National Planning Policy Framework (NPPF), issued by the Ministry of Housing, Communities and Local Government, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.
- 3.8 Paragraph 174 of the NPPF advises that, planning policies and decisions should contribute to and enhance the natural and local environment by *"...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"*.
- 3.9 Further, paragraph 186 advises that *"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."*

Planning Practice Guidance

- 3.10 In 2019, the Department for Communities & Local Government updated its on-line planning guidance to assist with interpretation of the NPPF. The guidance covers general matters such as relevance of air quality issues, role of the Local Plan, information sources, assessment approaches and mitigation. How considerations about air quality fit into the development management process is summarised by the guidance in a flowchart, which is included here in **Appendix C**.

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning for Air Quality 2017

- 3.11 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have produced this guidance to ensure that air quality is adequately considered in the land-use planning and development control processes.
- 3.12 The guidance clarifies when an air quality assessment is required and what it should contain. It sets out how impacts should be described and assessed. Importantly it sets out a recommended approach that can be used to assess the significance of the air quality impacts, taking account of the advice issued by IAQM. An

important focus of this guidance is on minimising the air quality impacts of all developments for which air quality assessments have been requested by the planning authority; this will be through good design and application of appropriate mitigation measures.

- 3.13 Stage 1 of the assessment in the local area seeks to screen out smaller development and/or developments where impacts can be considered to have insignificant effects. The Stage 1 criteria are set out in Table 3.2 and require any of the criteria in row A, coupled with any of the criteria in row B, to apply before an assessment proceeds to Stage 2. If none of the criteria are met then the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.

Table 3.2: Stage 1 Criteria

Criteria to Proceed to Stage 2
If any of the following apply: 10 or more residential units or a site of more than 0.5 ha - more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha
Coupled with any of the following: - the development has more than 10 parking spaces - the development will have a centralised energy facility or other centralised combustion process
Note: Consideration should still 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.

- 3.14 The criteria in Table 3.3 provide more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table 3.3: Indicative Criteria for Requiring an Air Quality Assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans < 3.5t gross vehicle weight)	A change of LDV flows of: more than 100 AADT within or adjacent to an AQMA more than 500 AADT elsewhere
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses > 3.5t gross vehicle weight)	A change of HDV flows of: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor Coupled with the car park having more than 100 movements per day (total in and out)
Have one or more substantial combustion processes.	Where the combustion unit is: any centralised plant using bio fuel any combustion plant with single or combined thermal input > 300kW

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
	a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year)
Have a combustion process of any size.	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.

- 3.15 Where an air quality assessment is identified as being required, this may be either a Simple or a Detailed Assessment. A Simple Assessment is one relying on already published information and without quantification of impacts, in contrast to a Detailed Assessment that is completed with the aid of a predictive technique, such as a dispersion model. Passing a criterion in Table 3.3 does not automatically lead to the requirement for a Detailed Assessment. Once again, where none of the criteria are met the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.
- 3.16 The purpose of the air quality assessment is to define the likely quantitative or qualitative changes in air quality or exposure to air pollution as a result of the proposed development.
- 3.17 The suggested framework for describing the impacts on the basis set out above is set out in Table 3.4. The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist. The Table is only intended to be used with annual mean concentrations, and all % changes are rounded up or down to whole numbers. At exposures less than 75% of the AQAL, the degree of harm is described as likely to be small. As the exposure encroaches and exceeds the AQAL the degree of harm increases, and the change becomes more important when the result is an exposure that is approximately equal to or greater than the AQAL.

Table 3.4: Impact Descriptors for Individual Receptors

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

- 3.18 A judgement of the significance of the impacts is to be made by a competent professional who is suitably qualified, and the reasons for reaching the conclusions should be transparent and set out logically. Whilst the starting point for the assessment of significance is the degree of impact, as defined by Table 3.4, this should be seen as only one of the factors for consideration, not least because the outcome of this assessment procedure applies to a receptor and not the overall impact of the scheme on the locality.

- 3.19 The guidance also makes it clear that the presence of an AQMA should not halt all development, but where development is permitted, the planning system should ensure that any impacts are minimised as far as is practicable. Even where developments are proposed outside of AQMAs, and where pollutant concentrations are predicted to be below the objectives/limit values, it remains important that the proposed development incorporates good design principles and best practice measures and that emissions are fully minimised.

Construction Dust Nuisance

- 3.20 There is no specific guidance relating to the assessment of construction dust nuisance within Government documents such as the DMRB. Consequently, guidance from relevant national bodies provides the best advice for establishing the potential impacts from dust. Research carried out by the Buildings Research Establishment (BRE) indicates that the likelihood of complaints concerning dust nuisance is related to the distance of receptors from a construction site and the duration of dust raising activities. This relationship is shown in Table 3.5.

Table 3.5: Likelihood of Dust Complaints by Distance

Duration of dust raising activity onsite	Distance from site			
	< 20 m	20 – 50 m	50 – 100 m	100 – 150 m
	Likelihood of complaint			
> 12 months	Very Likely	Very Likely	Likely	Potential Likelihood
6 – 12 months	Very Likely	Likely	Likely	Potential Likelihood
< 6 months	Very Likely	Likely	Potential Likelihood	Not Likely

Note: Beyond 150 m dust nuisance is considered largely unlikely (Upton & Kukadia, 2002, Measurements of PM₁₀ from a Construction Site: A Case Study, prepared by BRE Environment for National Society for Clean Air).

- 3.21 Further empirically derived measures of the maximum distance from a source of airborne dust within which significant adverse effects are likely to be observed, are presented in Table 3.6. These values reflect qualitative estimates derived from historical data presented within environmental assessment reports and expert evidence.

Table 3.6: Qualitative Construction Dust Assessment Criteria

Source Descriptors		Zone for Potentially Significant Effects (Distance from Source)	
Source	Duration	Soiling	PM ₁₀ *
Large construction sites	1 year or more	100 m	25-50 m
Moderate sized construction sites	Months	50 m	15-30 m
Minor construction sites	Weeks	25 m	10-20 m

*Based on 35 permitted exceedances of 50 µg/m³ in a year, as defined in The Air Quality (England) Regulations. Source: Adapted from Thames Gateway Bridge – Environmental Statement (Laxen, 2004)

Dust Risk Assessment

- 3.22 The Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction, February 2014, provides a framework for the assessment of risk.

- 3.23 The guidance divides activities on construction sites into four types to reflect their different potential impacts. These are:
- Demolition;
 - Earthworks;
 - Construction; and
 - Trackout.
- 3.24 The assessment methodology considers the following three separate dust effects, with account being taken of the distance of the receptors that may experience these effects.
- Annoyance due to dust soiling;
 - Harm to ecological receptors; and
 - The risk of health effects due to a significant increase in exposure to PM₁₀.
- 3.25 The assessment procedures and risk categories for each of the four phases of construction where the potential for dust is high, i.e., those listed above, are summarised in **Appendix D**.
- 3.26 Step 1 establishes that an assessment will normally be required where there are dwellings within 350m of the site boundary.

4.0 HINCKLEY & BOSWORTH BOROUGH COUNCIL AIR QUALITY REVIEW AND ASSESSMENT

4.1 Air quality within the Hinckley & Bosworth Borough Council (HBBC) area is generally good and, to date, no Air Quality Management Areas (AQMA) have been designated.

4.2 HBBC's most recently published 2021 Annual Status Report (ASR) states "*Overall Air Quality in the Borough is good when compared to the air quality objective value. Measures levels of NO₂ within the borough in 2020 shows an overall reduction of around 20% when compared to 2019 levels. Air quality was undoubtedly affected by the impact of Covid-19 and the associated reduction in traffic on the road network due to national lockdowns and other measures.*

The monitoring location on Shaw Lane in Markfield again measured levels of NO₂ lower than in recent years although as stated above the 2020 results were undoubtedly affected by the impact of Covid-19 and the associated reduction in traffic. The area will be kept under review and Environmental Health (Pollution) at HBBC have requested to be kept up to date with any developing plans for the road network."

4.3 Therefore, further investigation into HBBC's 2019 monitoring results, i.e., the full monitoring year prior to any impact associated with Covid-19, has been undertaken.

4.4 A review of the published 2019 monitoring results shows that annual mean concentrations of NO₂ prior to Covid-19 were similarly below the objective level of 40 µg/m³ at all monitoring locations, ranging between 19.1 µg/m³ at Earl Shilton Bypass, to 35.1 µg/m³ at Shaw Lane, Markfield.

4.5 In conclusion, air quality within the Borough of Hinckley and Bosworth is generally good, and there are currently no Air Quality Management Areas within the Borough. The area of concern at Shaw Lane is approximately 11km northeast of the Site and is therefore, sufficiently removed in that it will not have an effect on, nor be affected by, the proposed extension.

4.6 Nevertheless, it will be important that the air quality assessment for the Site looks at the potential effects of traffic generated by the extension upon existing dwellings adjacent to local roads to establish that there will be no adverse effects upon their existing standards of air quality. This matter is covered in the following section.

5.0 AIR QUALITY ASSESSMENT

Traffic Data

- 5.1 Baseline and ‘with development’ Annual Average Daily Traffic (AADT) flows and % heavy goods vehicles for Station Road have been prepared by the scheme’s traffic engineers (MJM Consultants). The total development flows for the Site are 91 AADT, which would not exceed the EPUK criteria of more than 500 AADT, outside an AQMA, as set out in Table 3.3. This information is presented in **Appendix E** for a baseline scenario without and with proposed development in 2033.

Methodology

- 5.2 An air quality screening assessment has been undertaken using the methodology defined by the Government’s Design Manual for Road and Bridge (DMRB), which is also an approved screening model (version 2007) under the LAQM guidance. The need for any detailed dispersion modelling is determined from the results of the DMRB screening.
- 5.3 The traffic flow data has been used to calculate ambient concentrations of air pollution at selected receptors representing existing dwellings adjacent to Station Road, i.e., at a distance of 8m from the road centreline of Station Road.
- 5.4 For determining compliance with air quality objectives, it is important that the contribution of emissions from baseline traffic is added to background concentrations already present in the area, or that which will be present in future years.

Background Concentrations

- 5.5 Suitable estimates of background air quality have been derived in accordance with LAQM.TG(22) using the air pollution background concentration maps published by Defra. The maps are updated by Defra periodically to reflect changes to underlying data including emissions factors. In recent years there have been annual updates due to new information on NO_x emissions from diesel vehicles, and fleet and vehicle activity data have also been updated. The projections in the LAQM background maps are based on assumptions which were current before the Covid-19 outbreak in the UK. In consequence, these maps do not reflect short or longer term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.
- 5.6 Average background pollutant concentrations for local 1 x 1 km grid squares are available for all future years, and Table 5.1 shows the background concentrations that were used in this assessment. Background values for NO_x are presented, as they are required in the conversion of modelled NO_x concentrations to total NO₂. Only those pollutants of real concern to the local authority, namely NO₂ and PM₁₀, are considered.

Table 5.1: Background Concentrations, Annual Mean ($\mu\text{g}/\text{m}^3$)

OS Co-ordinates	Year	NO _x	NO ₂	PM ₁₀	PM _{2.5}
439500, 303500	2019	10.84	8.35	13.19	8.08
	2023	9.59	7.45	12.56	7.58
	2030	8.30	6.51	12.23	7.32

- 5.7 In order to provide a robust scenario, the 2023 background concentrations have been used within the DMRB calculations in conjunction with the future traffic flow data.

Impact assessment

- 5.8 The information relating to traffic flows and background concentrations has been input to the DMRB screening model along with the distance representing the shortest distance between the centreline of the road and existing dwellings adjacent to the road. The results of the DMRB assessment are presented in **Appendix F**.
- 5.9 The results indicate that for a baseline situation in 2033, receptors adjacent to Station Road have values below the current annual mean air quality objectives for NO₂, PM₁₀ and PM_{2.5}.
- 5.10 With traffic generated by development in 2033, the absolute concentrations remain below the current air quality objectives and the level of change due to traffic generated by development is small (0.1 $\mu\text{g}/\text{m}^3$ or less to annual mean concentrations of NO₂, PM₁₀ and PM_{2.5}), which would not have a significant impact upon local air quality.
- 5.11 The ambient concentrations of local traffic emissions are predicted to be less than 75% of the Air Quality Assessment Level (AQAL) (see Table 3.4), and the % change in concentration relative to the AQAL due to development traffic is calculated to be less than 1%. On this basis, the development's impact on local air quality will be 'negligible'.
- 5.12 Using the significance flowchart in **Appendix C**, the development would not contribute to air quality exceedances or lead to the designation of a new AQMA, nor would it significantly increase emissions or lead to new exposure to emissions considered to be significant. Therefore, the air quality issues for the proposed development are not deemed to be a significant consideration.
- 5.13 Therefore, since the air quality assessment indicates that annual mean air quality objectives will be met at the most exposed receptor locations, and since the actual changes due to traffic generated by development are small and insignificant, it can be concluded that the air quality over the Site is acceptable for development and that baseline plus proposed development traffic will not have any adverse impacts on ambient air quality for existing dwellings. The results do not indicate a requirement for more detailed dispersion modelling.
- 5.14 Assessment has shown that the annual mean air quality objectives will be met at the most exposed receptor locations. It is therefore considered that development-specific mitigation will not be required.

Construction Dust Risk Assessment

- 5.15 Nuisance dust impacts are likely to be temporary and episodic (most noticeable during dry windy conditions) and would not persist beyond completion of construction.
- 5.16 Where dust raising activities are present for 12 months or more, dust complaints are considered to be very likely for those closest receptors to the Site up to 200m from the Site. The closest receptors are located approximately 50m west from the Site boundary.
- 5.17 In addition, the qualitative dust assessment criteria in Table 3.5 indicates that existing premises adjacent to the Site will lie within the zone for potentially significant effects for soiling and ambient concentrations of PM₁₀.
- 5.18 Applying IAQM risk assessment procedures as set out in **Appendix D** requires an assessment where there are sensitive receptors within 350m of the Site boundary of the works and/or within 100m of the routes used by construction vehicles on the public highway up to 500m from the Site entrance. Existing premises fall within 350m zone which triggers the initial screening criterion.
- 5.19 The stages considered by the dust risk assessment are presented in Table 5.2. The assessments and conclusions are based upon the classifications for a 'small' construction site, as the total working area for the various activities lies below the respective thresholds. There are no demolition requirements on the Site, and no known ecological areas within 50m of the works.
- 5.20 Due to the overall size of the Site, and lack of unpaved roads, the Site is classified as small in relation to the risk of dust being tracked out of the Site .

Table 5.2: Dust Risk Assessment

Step	Consideration	Demolition	Earthworks	Construction	Track-out
2a	Scale/nature of works	-	Small	Small	Small
2b	Sensitivity of area:				
	To dust soiling	-	Low	Low	Low
	To PM ₁₀ health effects	-	Low	Low	Low
	To ecological effects	-	-	-	-
2c	Risk of impacts	-	Negligible	Negligible	Negligible

- 5.21 The assessments in Table 5.2 and the IAQM matrices have been used to define the Site-specific mitigation requirements for the construction phases and the overall risk assessment for dust from the construction works is summarised in Table 5.3.

Table 5.3: Summary Dust Risk Table to define Site-Specific Mitigation

Source	Dust Soiling Effects	PM10 Effects	Ecological Effects
Demolition	-	-	-
Earthworks	Negligible	Negligible	-
Construction	Negligible	Negligible	-
Track-out	Negligible	Negligible	-

- 5.22 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Negligible Risk'.
- 5.23 Similarly, with regard to PM₁₀ effects, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Negligible Risk' to health.
- 5.24 Therefore, no mitigation beyond those required by legislation will be required.

6.0 CONCLUSIONS

- 6.1 Mewies Engineering Consultants Ltd (M-EC), has been commissioned by J. J. Churchill Limited to undertake an Air Quality Assessment for a proposed commercial development at J. J. Churchill, Station Road, Market Bosworth.
- 6.2 Assessments in accordance with Local Air Quality Management guidance indicate that for a baseline situation in 2033, receptors adjacent to Station Road have values below the current annual mean air quality objectives for NO₂, PM₁₀ and PM_{2.5}.
- 6.3 With traffic generated by development in 2033, the absolute concentrations remain below the current air quality objectives and the level of change due to traffic generated by development is small (0.1 µg/m³ or less to annual mean concentrations of NO₂, PM₁₀ and PM_{2.5}), which would not have a significant impact upon local air quality.
- 6.4 The ambient concentrations of local traffic emissions are predicted to be less than 75% of the Air Quality Assessment Level (AQAL), and the % change in concentration relative to the AQAL due to development traffic is calculated to be less than 1%. On this basis, the development's impact on local air quality will be 'negligible'.
- 6.5 Since the air quality assessment indicates that annual mean air quality objectives are met at the most exposed receptor locations, it can be concluded that the air quality over the Site is acceptable for development. The results do not indicate a requirement for more detailed dispersion modelling. Therefore, the matter can proceed to a planning decision, with conditions where appropriate.
- 6.6 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Negligible Risk'.
- 6.7 Similarly, with regard to PM₁₀ effects, the risk assessment indicates that on the basis of no mitigation being present, all phases would present a 'Negligible Risk' to health.
- 6.8 Therefore, no mitigation beyond those required by legislation will be required .



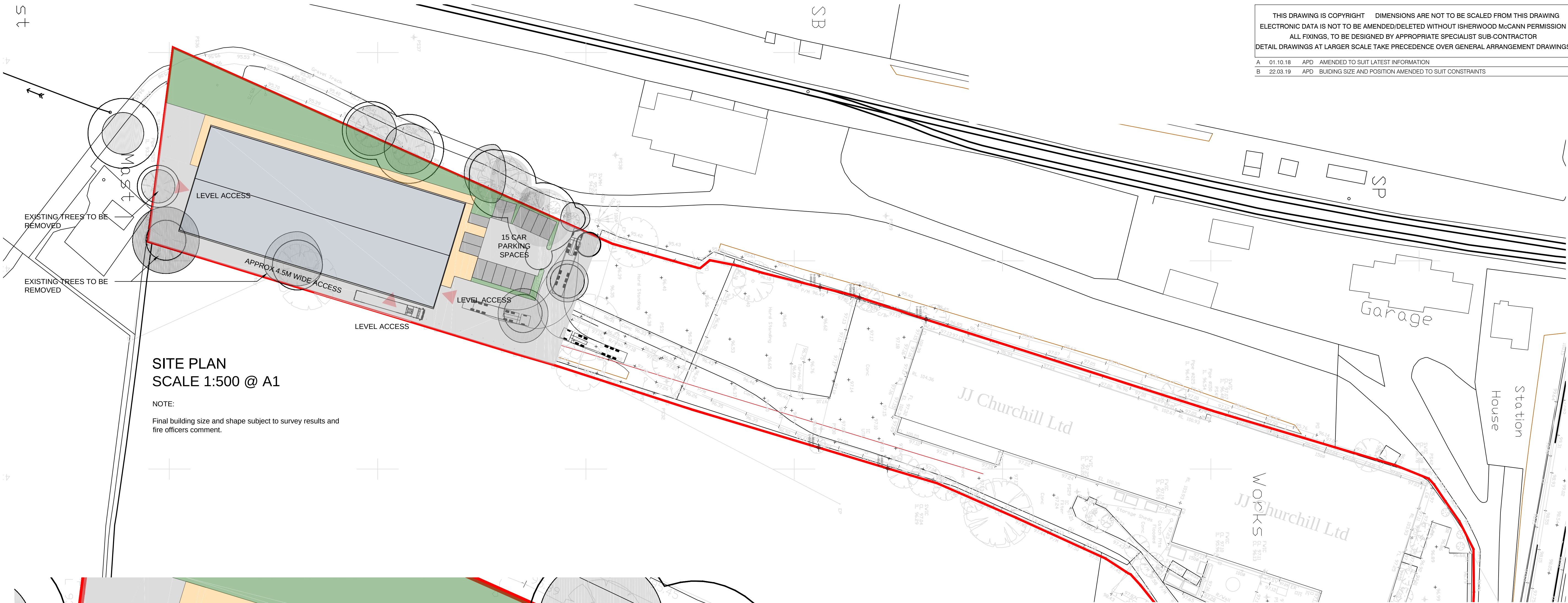
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APPENDICES

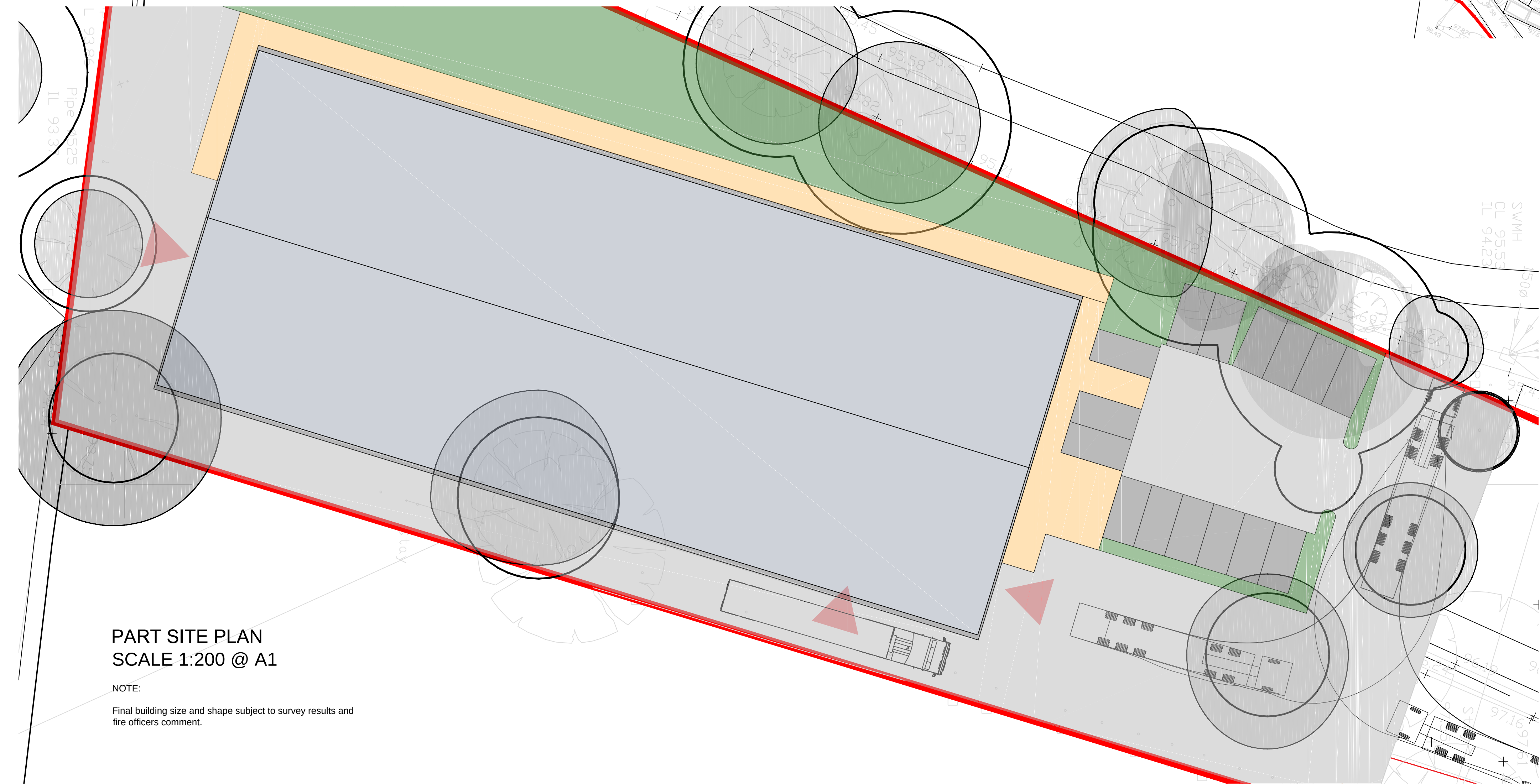


APPENDIX A



SITE PLAN
SCALE 1:500 @ A1

NOTE:
Final building size and shape subject to survey results and
fire officers comment.



PART SITE PLAN
SCALE 1:200 @ A1

NOTE:
Final building size and shape subject to survey results and
fire officers comment.

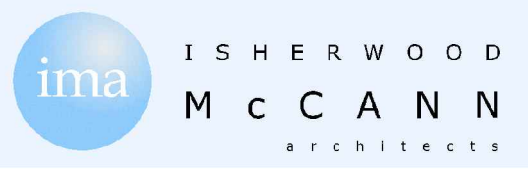
PROJECT: JJ CHURCHILL
FACTORY EXTENSION
STATION ROAD, MARKET BOSWORTH

STATUS: PRELIMINARY

DRAWING
TITLE: SITE PLAN

DATE: 25.07.18 DRAWN BY: APD

SCALE: 1:500 AT A1 CHECKED BY: APD

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APPENDICES



APPENDIX B

DEFINITION OF AIR QUALITY TERMS AND UNITS

ppm	parts per million - defines the units of pollution in every million (10^6) units of air.
ppb	parts per billion - defines the units of pollution in every billion (10^9) units of air.
$\mu\text{g}/\text{m}^3$	microgrammes per cubic metre - one microgramme is one millionth of a gram.
ng/m^3	nanogrammes per cubic metre – one nanogramme is one milliardth (i.e. one thousand millionth of a gram (10^{-9}))
Annual mean	the average of the concentrations measured for one year.
1-hour mean	the average of the concentrations measured for one hour.
24-hour mean	the average of the concentrations measured for twenty four hours.
Running mean	the mean or series of means calculated for overlapping time periods. For example, an 8-hour running mean is calculated every hour and averages the values for eight hours. The period of averaging is stepped forward by one hour for each subsequent value so that a degree of overlap exists between successive values. Non-running means are calculated for consecutive time periods so that there is no overlap.
Percentile	a value that establishes a particular threshold in a collection of data. For example, the 90 th percentile of yearly values is the value that 90% of all the data in the year fall below or equal.
Exceedance	a period of time when the concentration of a pollutant is greater than, or equal to, the relevant air quality standard.



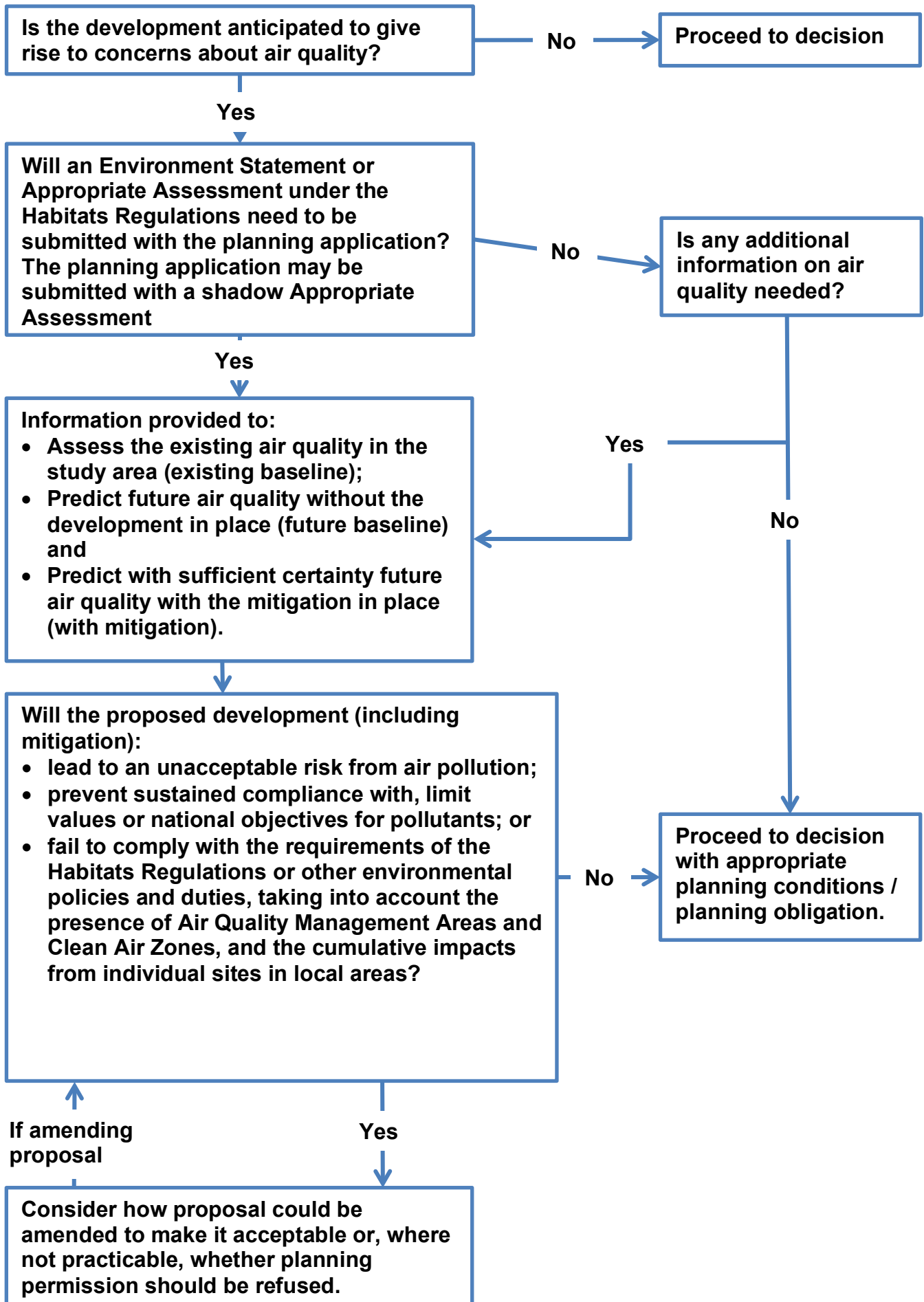
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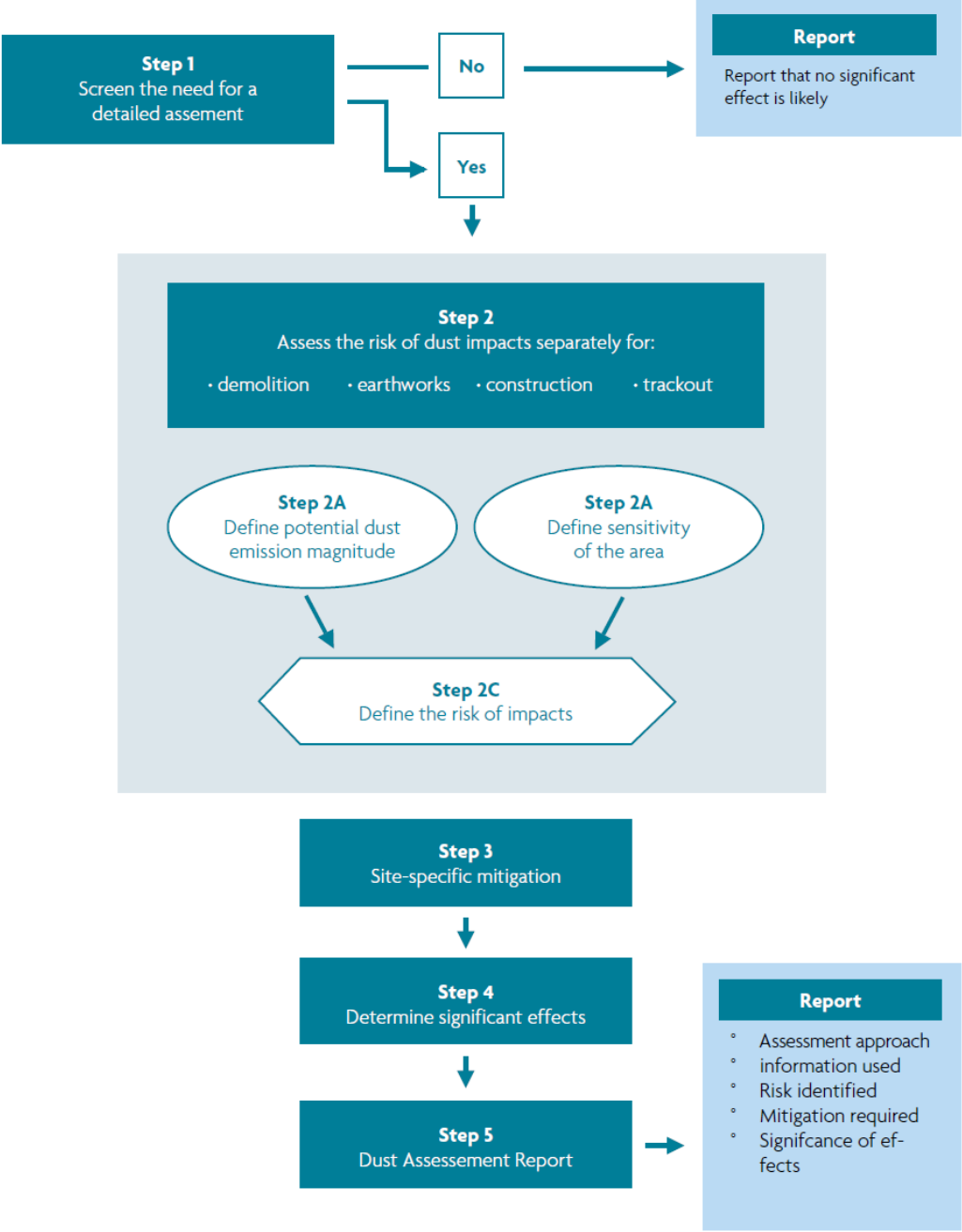
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APPENDIX D

Figure 1: Steps to Perform a Dust Assessment



Demolition

Examples:

- **Large:** Total building volume $>50\,000\text{ m}^3$, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities $>20\text{ m}$ above ground level;
- **Medium:** Total building volume $20\,000\text{ m}^3 - 50\,000\text{ m}^3$, potentially dusty construction material, demolition activities $10\text{-}20\text{ m}$ above ground level; and
- **Small:** Total building volume $<20\,000\text{ m}^3$, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities $<10\text{m}$ above ground, demolition during wetter months.

Earthworks

Examples:

- **Large:** Total site area $>10\,000\text{ m}^2$, 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 $>8\text{ m}$ in height, total material moved $>100\,000$ tonnes;
- **Medium:** Total site area $2\,500\text{ m}^2 - 10\,000\text{ m}^2$, moderately dusty soil type (e.g. silt), $5\text{-}10$ heavy earth moving vehicles active at any one time, formation of bunds $4\text{ m} - 8\text{ m}$ in height, total material moved $20\,000$ tonnes – $100\,000$ tonnes; and
- **Small:** Total site area $<2\,500\text{ m}^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds $<4\text{ m}$ in height, total material moved $<10\,000$ tonnes, earthworks during wetter months.

Construction

Examples:

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

Trackout

Examples:

- **Large:** >50 HDV ($>3.5\text{t}$) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length $>100\text{m}$;
- **Medium:** $10\text{-}50$ HDV ($>3.5\text{t}$) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road lengths $50\text{m}\text{-}100\text{m}$;
- **Small:** <10 HDV ($>3.5\text{t}$) outward movements in any one day, surface material with low potential for dust release, unpaved road length $<50\text{m}$.

These numbers are for vehicles that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

Table 2: Sensitivity of the Area to Dust Soiling Effects on People and Property ^{a b}

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

^a The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B, Box 6** and **Box 9**.

^b Estimate the total number of receptors within the stated distance. Only the *highest level* of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors < 50 m is 102. The sensitivity of the area in this case would be high.

^c For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50m from the edge of the road.

Table 3: Sensitivity of the Area to Human Health Impacts^{a b}

Receptor Sensitivity	Annual Mean PM ₁₀ concentration ^c	Number of Receptors ^d	Distance from the Source (m) ^e				
			<20	<50	<100	<200	<350
High	>32 µg/m ³ (>18 µg/m ³ in Scotland)	>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 (16-18 µg/m ³ in Scotland)	>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 (14-16 µg/m ³ in Scotland)	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m ³ (<14 µg/m ³ in Scotland)	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

^a The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B, Box 7** and **Box 9**.

^b Estimate the total within the stated distance (e.g. the total within 350m and not the number between 200 and 350m), noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20m of the source and 95 high sensitivity receptors between 20 and 50m, then the total of number of receptors < 50 m is 102. If the annual mean PM₁₀ concentration is 29µg/m³, the sensitivity of the area would be high.

^c Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32µg/m³ being the annual mean concentration at which an exceedence of the 24-hour objective is likely in England, Wales and Northern Ireland. In Scotland there is an annual mean objective of 18µg/m³.

^d In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties

^e For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Table 4: Sensitivity of the Area to Ecological Impacts^{a b}

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

^a The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout and for each designated site. See **STEP 2B, Box 8** and **Box 9**.

^b Only the highest level of area sensitivity from the table needs to be considered.

^c For trackout, the distances should be measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site.



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APPENDIX E

Road Name	Scenario	AADT	LGV	HGV	%HGV	%LGV	Speed (Kph)	Distance from Centreline (m)
Station Road	2019 Existing	5119	5049	70	1%	99%	45	8
	2023 Base	5326	5253	73	1%	99%	45	8
	2033 Do Nothing	5788	5709	79	1%	99%	45	8
	2033 Do Something	5879	5777	102	2%	98%	45	8



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APPENDIX F

Receptor number	Name	Year	NO ₂ ^(a)	PM ₁₀	PM _{2.5} ^(b)
			Annual mean µg/m ³	Annual mean µg/m ³	Annual mean µg/m ³
1	2019 Station Road	2019	9.27	13.54	8.56
2	2023 Station Road	2023	8.41	12.93	7.95
3	2033 DN Station Road	2033	8.49	12.96	7.98
4	2033 DS Station Road	2033	8.62	12.98	8.00
	Change		0.12	0.02	0.02

^(a)The NO₂ criteria are defined in terms of both the annual mean of 40 µg/m³, and the number of exceedances of a 1-hour mean of 200 µg/m³. Whilst the annual mean NO₂ value is calculated, the number of exceedances of the hourly standard cannot be calculated from the annual mean with a high degree of confidence. Therefore, only the annual mean NO₂ value is reported.



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