



Northern Gateway

Area GMA 1.2 – Noise & Air Quality High Level

Constraints review

A104444-5

June 2021

Prepared by WYG Environment Planning Transport Limited

On behalf of Northern Gateway Development Vehicle LLP



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Northern Gateway GMA 1.2
Noise and Air Quality High Level Constraints Review



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DRAWINGS

A104444-5-MAN-N-02 Site Location Plan

APPENDICES

Appendix A – Report Conditions

Appendix B – Noise Constraints Assessment



1.0 Introduction

WYG has been commissioned by Northern Gateway Development Vehicle LLP ('NGDV') to undertake a high-level desktop and site reconnaissance constraints and opportunities review of a site known as Area GMA 1.2 ('the site') at the proposed Greater Manchester Northern Gateway development area.

Part of the site is identified as Allocation GM 1.2 in the draft Greater Manchester Strategic Framework (GMSF). It forms part of the strategic cross-boundary 'Northern Gateway' allocation positioned around the intersection of the M60, M62 and M66 motorways.

1.1 Instruction

This desk top assessment and constraints review provides information to support the promotion of the site for allocation in the Greater Manchester Spatial Framework (GMSF) and the assessment work will inform the proposed Masterplan for the site.

This report has assessed the land shown on A104444-5-MAN-N-02 as this area was identified by the NGDV for baseline technical and environmental assessment. **However, only part of this wider assessment site is being identified for allocation for development within the GMSF (land to the south east of Simister).**

1.2 Objectives

The overall objectives of the report are to:

1. Provide background desktop and site reconnaissance information
2. To assess the constraints and opportunities for development
3. To present next steps a) to assess constraints and opportunities and b) to address planning requirements (for allocation stage only).



The findings of the noise assessment are summarised in the main body of the text with a separate noise constraints assessment including the findings of a noise survey presented in Appendix A.

1.3 Proposed Development

It is understood at this stage that Area GMA 1.2 will be developed for residential purposes as well as a potential primary school and local centre, with associated spine roads, public open space, and soft and hard landscaping.

2.0 Site Setting

2.1 Location and Size

Key details for Area GMA 1.2 are summarised in the table below.

Site Specifics	
Address	Land to the south of the M62 & east of the M60 junction (Simister Island), Rochdale and to south and west of the M60.
Grid Reference	Land to the south of the M62 & east of the M60: 383939, 405837 Land to the west and south of the M60: 382841, 405490
Site Area	Land to the south of the M62 & east of the M60: 146 Hectares Land to the west and south of the M60: 22 Hectares

2.2 Site Description

Both development packages, together forming the 'site' currently comprise agricultural land with local & main roads crossing through the proposed development area. There are a number of farms & residential properties within the site boundary.

Both sites have overhead power lines running through them with them being more notable on the land to the west and south of the M60.

Boundary	Description
North	Land to the south of the M62 & east of the M60: The M62 and agricultural land Land to the west and south of the M60: the Simister roundabout and M60 junction 18.
East	Land to the south of the M62 & east of the M60: The A6045, residential properties and agricultural land.



	Land to the west and south of the M60: The M60 carriageway with residential properties and agricultural land beyond.
South	Land to the south of the M62 & east of the M60: The M60 carriageway and residential properties with agricultural land beyond. Land to the west and south of the M60: Heaton Park.
West	Land to the south of the M62 & east of the M60: The M60 carriageway and residential properties with agricultural land beyond. Land to the west and south of the M60: A school and residential properties.

3.0 Desk Top Review

3.1.1 Noise Baseline

A noise technical report is appended to this document in Appendix B. The report presents details of a noise survey undertaken at the site in November 2019 which has informed noise modelling to establish the level of noise across the site. The noise survey has identified that road traffic noise is the dominant noise source across the site.

A Stage 1 assessment has been undertaken based on the guidance provided within the Professional Practice Guidance on Planning and Noise for new residential development (ProPG) (2017). The Stage 1 risk assessment identifies that the acoustic challenges at areas within the site are low to high risk and, therefore, a good acoustic design process will be required to be followed at later design stages. Recommendations of how a good acoustic design can be achieved at the site are presented in the noise technical report and summarised below.

3.1.2 Air Quality Baseline

Source of Information Consulted

In order to complete the high-level constraints, a review of the following sources of information were consulted:

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, (Revised) February 2019.
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019.
- The Air Quality Standards Regulation (Amendments), 2016.
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2018.
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014.
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017.
- Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, IAQM, October 2018.
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.0), IAQM, June 2019.
- Defra Background Maps (<https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>) (May 2019);
- Air Pollution Information Systems (APIS) (<http://www.apis.ac.uk/>); and,
- MAGIC maps (<http://www.natureonthemap.naturalengland.org.uk/magicmap.aspx>).

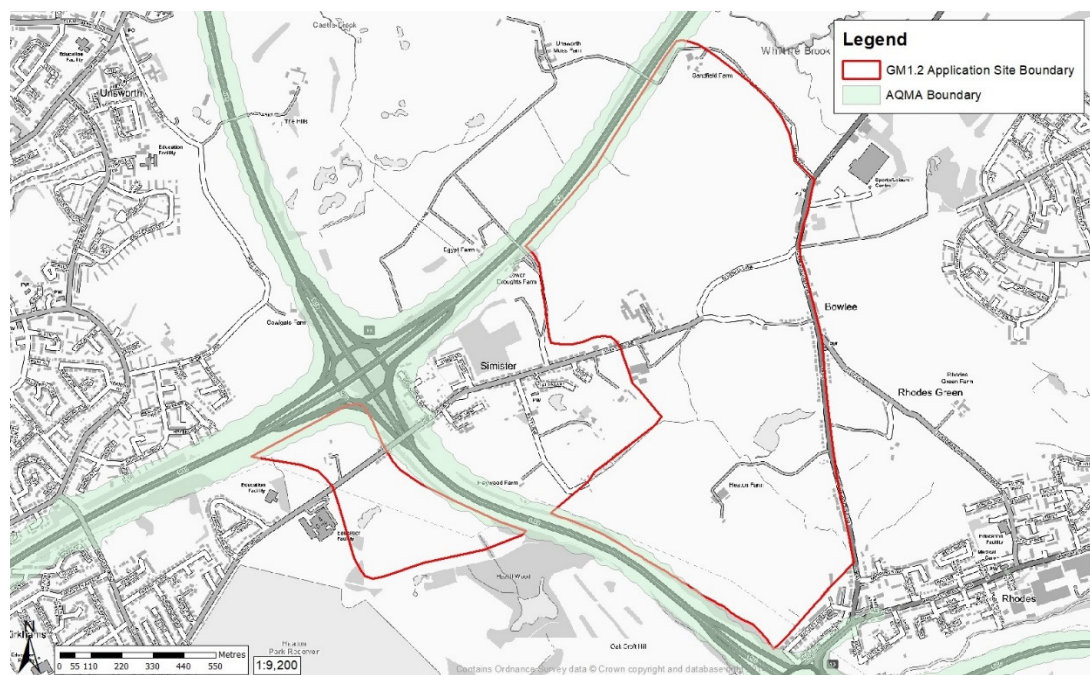
Existing Air Quality

The proposed development site comprises two parcels, east and west of the M60, south of the M60/M62 junction (Junction 18). Motorway emissions associated with the M60 and M62 are considered to be the greatest source of emissions surrounding the proposed development site. Greater Manchester

have declared an Air Quality Management Area (AQMA) for Nitrogen Dioxide (NO₂) primarily from traffic emissions where there are exceedances of the national Air Quality Objective of 40µg/m³. The location of the AQMA in relation to the site is shown on Figure A104444-5-MAN-N-701 below. The AQMA is attributed to the motorway network.

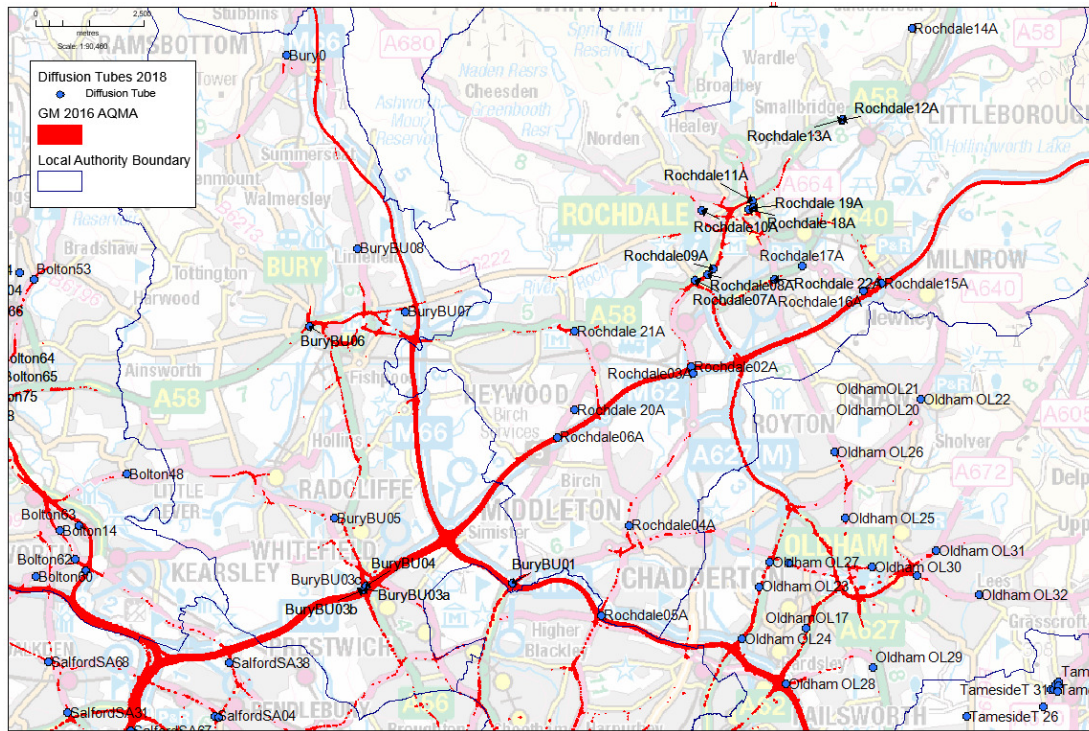
Figure A104444-5-MAN-N-701 AQMA in Relation to the Site

Map



The Local Authority monitoring around the site is shown in **Figure A104444-5-MAN-N-702** below.

Figure A104444-5-MAN-N-702 Local Authority Air Quality Monitoring Around the Site



The monitored concentrations of NO₂ which is the pollutant of primary concern around the site are given below.

Table 3.1 Monitored NO₂ Concentrations in 2018

Monitoring Location	Monitored Concentration (µg/m ³)
BU01	27.9
BU03a	26.4
BU03b	26.3
BU03c	26.4
BU04	31.2
Rochdale06A	41.9
Rochdale 20A	31.1
Annual Mean Limit not to be exceeded	40µg/m³



As shown above, levels recorded in the latest available year of 2018 were generally below the air quality objective, with the exception of Rochdale 06A.

Following a review of the site and surrounding area using the online MAGIC facility, no ecological receptors sensitive to changes in pollution were identified. WYG Air Quality Consultants have liaised with the Project Ecologist, who have confirmed that there are no European or National designated sites within 2.0km of the site boundary. However, two Local Nature Reserves (LNRs) have been identified within 2.0km of the site boundary. In terms of construction phase effects upon the ecological sites, LNRs are of 'low' sensitivity in terms of dust deposition in accordance with the IAQM Guidance on the 'Assessment of Dust from Demolition and Construction' (published in January 2014). Therefore, with implementation of recommended mitigation in the form of best practice site management measures, no adverse impacts are expected at the LNRs as a result of the development.

4.0 Constraint & Opportunities

4.1 Constraints Overview

A number of mitigation options have been considered in the following section with regard to both air quality and noise. Providing these mitigation options are considered at planning stage, it is not considered that any of the identified constraints would preclude the development. On this basis it is considered that through incorporation of these mitigation options it could be demonstrated that the site would be suitable for allocation.

4.2 Constraints and Potential Mitigation

4.2.1 Noise

Following the guidance provided within the ProPG, a good acoustic design process will need to be followed with regard to mitigating noise associated with the M62 and M60.

Various recommendations are presented in the technical report to mitigate against noise which are summarised as follows:

- Screening of the motorways will be required by building orientation and / or barriers such as close boarded fences or earth bunds.
- For the 1st tier of properties facing the motorways, gardens will need to be positioned to the rear of dwellings with the buildings providing a screen. Closer to the motorway, it is likely further screening in the form of acoustic fences or earth bunds will be required.
- With regard to the distance of proposed residential premises from the motorways, at this stage it is considered that a minimum stand-off of 50m from any motorway carriageway should be included within the design. This would allow for the attenuation of noise with distance and an allow space for any barriers such as close boarded acoustic fences

or earth bunds to be constructed. If greater stand-off's can be incorporated this would be beneficial in terms of noise mitigation.

- Generally standard double glazing should be acceptable within the site but for habitable rooms located close to the adjacent motorways, enhanced glazing may be required. Alternative ventilation will need to be considered within the parts of the site most exposed to road traffic noise. Such design measures are typical of development in similar areas close to motorways or main roads and are not considered to be prohibitive.
- In addition to road traffic noise, isolated farmsteads are located within or adjacent to the site boundary in the eastern parcel of the site. No noise from these premises was observed during the survey but a good design measure would be to avoid positioning dwellings or gardens immediately adjacent to the curtilage of such premises.

Through the adoption of a good acoustic design as the master planning of the site evolves, significant adverse effects can be avoided.

4.2.2 Air Quality

Future development traffic has the potential to increase pollutant levels in this sensitive area and affect levels within the Air Quality Management Area. The screening criteria from the EPUK & IAQM guidance document is given below where, if no exceedances of these levels occur, further assessment can be screened out:

- Change of light vehicles by
 - More than 100 annual average daily trips (AADT) within or adjacent to an AQMA
 - More than 500 AADT elsewhere
- Change of HGV by:



- More than 25 AADT within or adjacent to an AQMA
- More than 100 AADT elsewhere

Any receptors near roads experiencing less than this change in traffic would not be expected to receive a significant effect with regards to changes in pollutant levels.

As the proposed development is partially located within the Greater Manchester AQMA, predicted concentrations within the AQMA are expected to be around the Air Quality Objective of 40 µg/m³.

DEFRA’s NO₂ ‘Fall off with distance calculator’ has been used with the worst case monitoring adjacent to the M62, to calculate an approximate distance at which concentrations at the proposed development site would be below the Air Quality Objective of 40µg/m³ and below 36µg/m³ (a 10% sensitivity test) and are shown in Table 4.1 below.

Table 4.1 Potential Stand-off Distances

Monitored Level at Rochdale 06A (at 15m from M62) (µg/m ³)	Calculated NO ₂ concentration at 20m from Motorway (µg/m ³)	Calculated NO ₂ concentration at 40m (µg/m ³)
41.9	39.5	35.4

As the noise assessment is recommending a 50m standoff, the above suggests that this stand off from the motorway would be sufficient to prevent any future receptors experiencing levels of pollution greater than the Air Quality Objective limit.

As the monitoring on the M60 at BU01 monitored a concentration below 40µg/m³, there is unlikely to be any significant constraints from the M60.

Air Quality Risk



It should be noted that if there is a predicted concentration above $40 \mu\text{g}/\text{m}^3$ at any proposed dwelling as a result of the development, this would cause the Local Authority to extend the Greater Manchester AQMA. However, the proposed 50m noise buffer stand-off distance which need to be incorporated within the site layout, should be sufficient to provide a suitable standoff and avoid the occurrence of such an exceedance.

4.3 Opportunities

With regard to noise and air quality, opportunities include the large site area enabling consideration within the design to avoid or minimise significant adverse impacts.

As stated within the GMSF report, the development will be required to *'develop a satisfactory management plan for areas of green infrastructure, biodiversity features and other areas of open space.'* To make efficient use of land, it would not be unreasonable to locate such features in the stand-off zones adjacent to the motorways, however, it is also recommended that there is provision for such areas in quieter / central parts of the site to provide opportunities for amenity space in a more tranquil environment.

Regarding air quality, there is the opportunity to include best practice mitigation measures as recommended below:

The provision of Electric Vehicle (EV) charging points to serve new residential dwellings in communal parking/charging bays. Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety.

With these measures in place, and through appropriate assessment, there are unlikely to be any restrictions to the developability of the site.

Northern Gateway GMA 1.2
Noise and Air Quality High Level Constraints Review



5.0 Planning Requirements

5.1 Next Steps – Requirements for Allocation

With regard to noise and air quality, no further work is considered to be required at this stage.

5.2 Next Steps – Requirements for Future Planning Application

5.2.1 Noise

Iterative input should be provided as necessary during master planning to feed into a good acoustic design process. Noise modelling should be undertaken based on illustrative proposals to more accurately define what noise control measures, e.g. stand-off distance, barriers, building orientation, need to be incorporated.

A road traffic noise assessment may also need to be undertaken to consider any on-site receptors which are located within proximity of any internal access roads. This could be undertaken once details of traffic generation associated with the development are known.

5.2.2 Air Quality

Based on the likely number of development trips and master plan, a detailed air quality model should be developed to establish the significance of effects including the cumulative effect of development traffic on the surrounding Greater Manchester Air Quality Management Area (AQMA). This is in accordance with the IAQM Guidance for 'Land-Use Planning & Development Control: Planning For Air Quality' (January 2017) which states that if the development will result in greater than 100 Annual Average Daily Traffic (AADT) flows for car or 25 AADT for HGV's entering the AQMA, a detailed Air Quality Assessment would be required.

Given the proposed residential use of the site and the likely number of development trips, the pollutants concentration at the surrounding existing



residential dwellings and adjacent AQMA, are expected to increase.

As the proposed development site use will be introducing highly sensitive receptors (residential dwellings), adjacent to the AQMA. As the proposed development is classified as sensitive in terms of air quality, an assessment of the predicted exposure from the adjacent and surrounding motorway road network will be required.

Detailed Air Quality Assessment inclusive of dispersion modelling should be undertaken as an iterative process as the scheme evolves.

The results of the detailed Air Quality Assessment are expected to show an increase in pollutant concentration associated with the scheme. A review of the existing surrounding local authority monitoring, and estimated car and HGV vehicle movements has shown that an increase of 100 AADT HGVs and/or 1,000 AADT cars are likely to show a significant effect in EIA terms.

Mitigation in the form of sustainable transport options should therefore be implemented. Sustainable transport options including a travel plan, which promotes sustainable transport measure (e.g. electric vehicle charging points and/or care share schemes) would provide suitable mitigation measures to reduce the effects of air quality upon the surrounding and proposed sensitive receptors.

The results of the Air Quality Assessment, based upon the latest Defra predictions, will assume a reduction in pollutants over time based upon the use of more sustainable transport options (e.g. electric vehicle). However, the level of reduction in pollutants cannot be quantified without undertaking a detailed assessment.

Following the implementation of the above mitigation, air quality effects would not be significant and there would be no air quality constraints that would preclude the proposed development of the site.



6.0 Conclusion

As the proposed development is classified as sensitive in terms of air quality, an assessment of the predicted exposure from the adjacent and surrounding motorway road network will be required. However, the desk-based air quality assessment has determined that, with the proposed 50m buffer stand-off distance incorporated within the site layout and implementation of mitigation in the form of sustainable transport options, it is not expected that there will be adverse effects in terms of air quality as a result of the development.

Based upon the assessment work to date there are no noise or air quality constraints which preclude the proposed development. This report identifies the levels of risk associated with each constraint and how they can be assessed and managed into the design of the scheme at detailed planning stage.

No further work is considered to be required at this stage to support the allocation of the site as proposed.

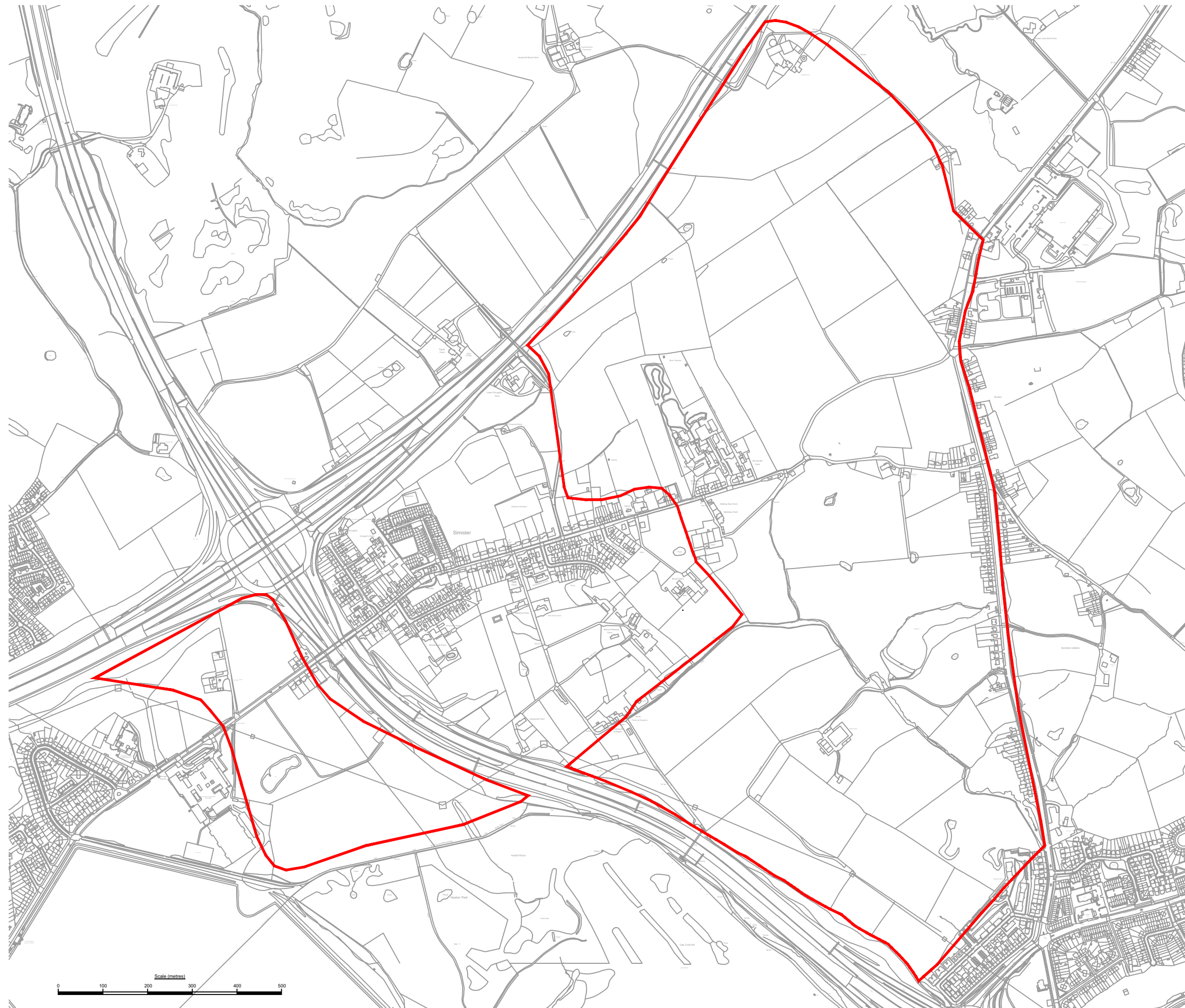


DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

KEY



GMA 1.2 - SITE BOUNDARY



B	PREVIOUS SITE BOUNDARIES REMOVED	CM	CEM	PG	04.12.19
A	GMA 1.2 BOUNDARY UPDATED	CM	CEM	PG	19.11.19
REV	DESCRIPTION	BY	CHK	APP	DATE

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Client:
NORTHERN GATEWAY DEVELOPMENT VEHICLE LLP

Project: A104444-5
NORTHERN GATEWAY GMA 1.2

Drawing Title:
GMA 1.2: SITE BOUNDARY PLAN

Scale @	A3	Drawn	Date	Checked	Date	Approved	Date
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Project No.	Office	Type	Drawing No.	Revision
A104444-5	MAN	N	02	B



Appendices

Appendix A – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of Northern Gateway Development Vehicle LLP (“the Client”) for the proposed uses stated in the report by WYG Environment Planning Transport Limited (“WYG”). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder’s permission.

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.



The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.



Appendix B – Noise Constraints Assessment



Northern Gateway

Area GMA 1.2

Northern Gateway Development Vehicle LLP

Noise Constraints Report

December 2019

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Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Sketches

Appendix C – Report Conditions



1.0 Introduction

This noise constraints report has been prepared by WYG Environment and Planning on behalf of Northern Gateway Development Vehicle LLP. This submission is made to Bury Metropolitan Borough Council to support the allocation of a site proposed for housing development which is split into two parcels of land traversed by the M60. The M60 bounds the western parcel to the north whilst the M62 bounds the eastern parcel to the north.

A noise survey has been undertaken to define baseline conditions at the site. Based on the survey data, the noise levels across the proposed development have been predicted using CADNA noise modelling software which incorporates ISO 9613 and CRTN methodologies and calculations.

A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and a set of location plans and noise contour plots relevant to the assessment are presented in Appendix B. Report Conditions are presented in Appendix C.

1.1 Legislative Context (England)

To provide context, policy guidance with respect to noise is found in National Planning Policy Framework (NPPF), published in February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

A further 2 short statements are presented at paragraph 180, which state:

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



- a) *"mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*
- b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational an amenity value for this reason."*

Furthermore, paragraphs 182 and 183 state:

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to, *'identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.'*

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 Noise Exposure Hierarchy

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly	No Observed Adverse Effect	No specific measures required



	affect the acoustic character of the area but not such that there is a change in the quality of life.		
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Observed Adverse Effect	Prevent

The NPPF, NSPE and NPPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents, including the 'BS 8233 – Guidance on sound Insulation and Noise Reduction for Buildings' (2014), Section 2.0 presents the noise level criteria used as a basis of this assessment.

The NPPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*



2.0 Assessment Criteria

2.1 LOAEL and SOAEL Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified.

Table 2.1 Noise Level Criteria and Actions

Effect Level	Assessment	Noise Level Criteria	Action / Justification
Lowest Observed Adverse Effect Level (LOAEL)	Proposed Residents	Internal noise levels achieve: Bedrooms (night-time) – 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} Living Rooms (daytime) – 35 dBL _{Aeq,16hours} Private external Amenity Space (daytime) – 50 dBL _{Aeq,16hours}	None Within BS8233 / WHO Criteria
Significant Observed Adverse Effect Level (SOAEL)	Proposed Residents	Internal noise levels exceed (with windows closed): Bedrooms (night-time)– 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} Living Rooms (daytime)– 35 dBL _{Aeq,16hours} Depending on context, external noise levels exceed: Private external Amenity Space (daytime) – 60 dBL _{Aeq,16hours} *	Mitigate to achieve (with windows closed): Bedrooms – 30 dBL _{Aeq,8hours} / 45 dBL _{Amax} Living Rooms – 35 dBL _{Aeq,16hours} <i>Depending on context, external amenity space</i> Mitigate and reduce to a minimum*

For the purposes of this assessment, the target noise level criteria with regard to habitable spaces is 35 dB L_{Aeq,16hours} for living rooms and 30 dB L_{Aeq,8hours} or 45 dB L_{Amax} (no more than 10 to 15 times per night) for bedrooms.

*With regard to noise in private external amenity areas, Section 7.7.3.2 within BS 8233 specifies that it “is desirable that the external noise level does not exceed 50 dB L_{Aeq,T} with an upper guideline value of 55 dB L_{Aeq,16hours} which would be acceptable in noisier environments”. However, BS8233 recognises that these guidelines values “are not achievable in all circumstances where development may be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity



spaces, but should not be prohibited”.

2.2 ProPG Planning and Noise

Professional Practice Guidance on Planning and Noise for new residential development (ProPG) was published in May 2017 by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA). The guidance has been published to provide practitioners with guidance on the management of noise within the planning system in England.

The guidance is specifically for ‘*new residential development*’ that would be exposed predominantly to noise from existing transport sources and reflects the Government’s overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF), and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance.

The guidance provides advice for Local Planning Authorities (LPAs), developers, and their respective professional advisers which complements Government planning and noise policy and guidance and, in particular, it aims to:

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- Promote appropriate noise exposure standards; and
- Assist the delivery of sustainable development (ADS).


There are two stages of the overall approach outlined in the ProPG:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of 4 key elements which is underpinned by an Acoustic Design Statement.

With regard to Stage 1, the ProPG provides guidance for producing an initial site risk assessment, pre-mitigation, with regards to noise based on the prevailing daytime and night time noise levels across the site, from which the site (or areas thereof) can be allocated a Noise Risk as shown in Figure 2.1, below. This shows the various Noise Risks Categories (NRC) together with their corresponding sound levels as referred to in the ProPG. It should be noted that the categories are not distinct which allows context to be included

within the assessment with the purpose of the Stage 1 assessment to determine the likely acoustic challenges on the site.

Figure 2.1 ProPG Stage 1, Noise Risk Assessment

Noise Risk Assessment	Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
<p>Indicative Daytime Noise Levels $L_{Aeq,16hr}$</p> <p>Indicative Night-Time Noise Levels $L_{Aeq,8hr}$</p> <p>70 dB / 60 dB</p> <p>65 dB / 55 dB</p> <p>60 dB / 50 dB</p> <p>55 dB / 45 dB</p> <p>50 dB / 40 dB</p> <p>High</p> <p>Medium</p> <p>Low</p> <p>Negligible</p>	 <p>Increasing risk of adverse effect</p>	<p>High noise levels indicate that there is an increased risk that development may be refused on noise grounds. The risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.</p> <p>As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrates that a significant adverse noise impact will be avoided in the finished development.</p> <p>At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.</p>
	<p>No adverse effect</p>	<p>These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.</p>

At Stage 2, which is not required to be progressed if the Stage 1 assessment determines a negligible risk, there are 4 elements which should be undertaken in parallel. These are:

- Good Acoustic Design Process
- Internal Noise Level Guidelines
- External Amenity Area Noise Assessment
- Assessment of Other Relevant Issues



There is then the requirement to present an ADS to provide sufficient evidence that the ProPG Stage 1 and Stage 2 Elements 1 to 4 have been followed. At this initial site promotion stage, a detailed site layout is not available and, therefore, a Stage 2 Assessment is not required. However, noise design measures will be established on how the site could be brought forward in adherence of the requirements of the ProPG.



3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three dimensional noise modelling has been undertaken based on the monitoring data to predict L_{Aeq} and L_{Amax} noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used which is based on the Department of Transport Calculation of Road Traffic Noise (CRTN) and ISO 9613 noise propagation methodology.

The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels	Ordnance Survey / WYG	2m contours in the area within and surrounding the site – verified against onsite topographical survey
Traffic data	WYGE	Available traffic data based on DfT 24hr (converted to 18hr traffic flows) on the M62, M60, M66 and Heywood Old Road and WYGE validated noise measurements.
Building heights – around site and surrounding area	WYGE Observations	8m height
Receptor positions	WYGE	1.5m height for model grid (day) and monitoring locations for validation. 4m for model grid (night).
Absorbent Ground	CADNA	Soft ground with roads set to hard ground

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst case.



3.2 Model Input Data

Model Verification

The model was verified by modelling the monitoring locations for the 'existing' scenario based on noise surveys undertaken by WYGE in 2019. The noise models have been built up with reference given to traffic flows on the M62, M60 and Heywood Old Road available on the Department of Traffic website which have then been corrected to verify against the measured noise level data. To present a reasonable worst-case scenario, measured noise levels collected on during the daytime on 18th September 2019 and during the night-time on 18th / 19th September 2019 have been used as part of the verification process. At all LT locations data collected on this day represents either the highest measured $L_{Aeq,T}$ or is within 1 dB of the highest measured daily $L_{Aeq,T}$ over the survey period. A comparison between the monitoring and modelling results are shown in the Tables below.

Table 3.1 Modelled vs. Monitored Results L_{Aeq} ; daytime 07:00 – 23:00

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	61.4	61.4	0.0
LT2	63.8	63.8	0.0
LT3	75.5	75.5	0.0
LT4	69.0	69.2	0.2
ST1	59.8	64.0	4.2
ST2	61.6	62.8	1.2
ST3	69.1	69.8	0.7
ST4	54.8	61.1	6.3
ST5	72.0	68.0	-4.0
ST6	61.6	60.8	-0.8
ST7	70.5	67.8	-2.7
ST8	62.9	58.6	-4.3

All values are sound pressure levels in dB re: 2×10^{-5} Pa

Table 3.2 Modelled vs. Monitored Results L_{Aeq} ; night-time 23:00– 07:00

Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
LT1	58.2	58.2	0.0
LT2	58.2	58.2	0.0
LT3	71.4	71.4	0.0
LT4	67	67.3	0.3



Location	Monitored L_{Aeq}	Modelled L_{Aeq}	Difference between Monitored and Modelled Results
ST2	55.8	58.4	2.6
ST5	66.8	62.2	-4.6
ST6	45.4	53.2	7.8
ST7	66.6	62.0	-4.6

All values are sound pressure levels in dB re: 2×10^{-5} Pa

The verification points show a divergence between monitored and modelled results of within 1 dB at all LT locations. Greatest weight has been applied to the measurements collected at LT locations as noise monitoring was undertaken over a greater period of time and is based on reasonable worst-case assumptions. In most cases, and at all positions within the site, the modelled noise levels are greater than the measured short-term noise level which is considered to present a reasonable worst-case scenario. Therefore, all models are assumed to be suitably verified.

Following a review of the long term noise data, by addressing the L_{Aeq} in bedrooms, the required glazing and ventilation specification will be sufficient to address the majority of peak (L_{Amax}) noise levels from road traffic noise.

Model Verification Assumptions

As stated above, the noise models have been built up with reference given to traffic flows on the M62, M60 and Heywood Old Road available on the Department of Traffic website which have then been corrected to verify against the measured noise level data (based on a reasonable worst-case daily noise level).

Traffic data is available in 24 hour AADT format and has been corrected by a factor of 0.9 to estimate the 18hr AAWT flow. This generates a $L_{A10,18hr}$ source noise level for each link which has then been further corrected by -2 dB to determine the relevant $L_{Aeq,16hr}$ daytime noise level.

Assumptions have been made with regard to the volume of traffic and associated source noise level on the M62 J18 slip roads to verify against the measured noise levels. If during later design stages, traffic data is available for the slip roads then these assumptions could be verified.

In terms of further noise generation, significant changes in traffic volume are required to provide noticeable changes in noise levels. Assuming vehicle speeds and HGV percentage remain the same, then a 25% change in traffic flow would result in a 1 dB increase which is the lowest change perceptible to the human ear with a 100% increase resulting in a 3 dB change. Given the high volume of existing traffic, it is considered unlikely that any increases in traffic as a result of the proposed development would significantly change the findings of the assessment particularly as a reasonable worst-case assessment has been undertaken at this stage.



4.0 Noise Survey

4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Norsonic 140	Environmental Noise Analyser	s/n	1402987
Norsonic 1251	Sound Calibrator	s/n	25010
Rion NL-52	Environmental Noise Analyser (WYG19)	s/n	253701
Rion NL-52	Environmental Noise Analyser (WYG23)	s/n	732146
Rion NL-52	Environmental Noise Analyser (WYG27)	s/n	264490
Rion NL-52	Environmental Noise Analyser (WYG31)	s/n	1276552
Rion NC-75	Sound Calibrator	s/n	35270131

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, a drift of 0.1 dB was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A baseline monitoring survey was undertaken at twelve locations (as specified in the following table and shown in SK01 of Appendix B) from Monday 18th November 2019 to Thursday 21st November 2019. Attended short term measurements were undertaken at eight locations during day, evening and night-time periods with four additional locations being measured unattended over a 71-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey, with a predominant south-easterly wind direction throughout.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Northern boundary of the site, approx. 180m south of M62
LT2	Eastern boundary of the site, approx. 10m from Heywood Old Road
LT3	Southern boundary of the site, approx. 10m from M60
LT4	North west boundary of the site, approx. 6m from M62 westbound slip road



Ref	Description
ST1	North west boundary of the site, approx. 80m from M62
ST2	North west boundary of the site, adjacent Simister Lane, approx. 181m west of M60
ST3	Western part of the site, approx. 20m west of M60
ST4	Northern boundary of the site, approx. 180m south of M62
ST5	Eastern boundary of the site, at junction of Heywood Old Road and Bluebell Lane
ST6	Centre of the site, adjacent to 155 Simister Lane
ST7	South east of the site, adjacent 57 Heywood Old Road
ST8	South of the site, adjacent 27 Baguley Crescent

4.2 Noise Survey Results

The dominant noise source found in the area is road traffic noise from M60, M62 and Heywood Old Road (A6045).

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5 minute measurement over the stated survey period.

Table 4.2 Meteorological Conditions during the Survey

Survey Location	Date & Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Day ST1	19/11/2019 15:33	5	N / A	SE	8	Road traffic noise M62
Day ST2	19/11/2019 13:02	6	1 - 2	SE	8	Road traffic noise Simister Lane
Day ST3	19/11/2019 14:12	6	N / A	SE	8	Road traffic noise M60
Day ST4	20/11/2019 13:19	5	4 - 5	SE	8	Road traffic noise M60
Day ST5	19/11/2019 11:31	6	1 - 2	SE	8	Road traffic noise Heywood Old Road
Day ST6	20/11/2019 12:50	6	4 - 5	SE	8	Road traffic noise Simister Lane
Day ST7	20/11/2019 14:01	5	1 - 2	SE	8	Road traffic noise Heywood Old Road
Day ST8	20/11/2019 15:09	6	N / A	SE	8	Road traffic noise M60
Eve ST2	20/11/2019 20:22	6	2 - 3	SE	8	Road traffic noise Simister Lane
Eve ST5	20/11/2019 19:37	6	1 - 2	SE	8	Road traffic noise Heywood Old Road
Eve ST6	20/11/2019 20:00	6	2 - 3	SE	4	Road traffic noise Simister Lane



Survey Location	Date & Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Eve ST7	20/11/2019 19:17	6	2 - 3	SE	4	Road traffic noise Heywood Old Road
Night ST2	21/11/2019 00:03	4	3 - 4	SE	4	Road traffic noise Simister Lane
Night ST5	20/11/2019 23:19	4	3 - 4	SE	4	Road traffic noise Heywood Old Road
Night ST6	20/11/2019 23:43	4	2 - 3	SE	4	Road traffic noise Simister Lane
Night ST7	20/11/2019 23:00	4	3 - 4	SE	4	Road traffic noise Heywood Old Road

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2×10^{-5} Pa).

Table 4.3 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
Weekday Daytime 07:00 - 23:00	47 Hours	18/11/2019 – 21/11/2019 10:14 – 08:49	LT1	58.4	95.2	45.7	57.6	54
Weekday Night-time 23:00 – 07:00	24 Hours	18/11/2019 – 21/11/2019 23:00 – 07:00		54.9	66.3	38.2	53.4	52
Weekday Daytime 07:00 - 23:00	28 Hours	19/11/2019 – 21/11/2019 12:41 – 08:31	LT2	63.5	92.1	43.5	66.9	54
Weekday Night-time 23:00 – 07:00	16 Hours	19/11/2019 – 21/11/2019 23:00 – 07:00		58.1	83.9	30.4	56.6	40
Weekday Daytime 07:00 - 23:00	43 Hours	18/11/2019 – 21/11/2019 15:20 – 09:25	LT3	75.7	92.3	54.8	77.8	72
Weekday Night-time 23:00 – 07:00	24 Hours	18/11/2019 – 21/11/2019 23:00 – 07:00		71.0	88.0	36.9	72.7	52
Weekday Daytime 07:00 - 23:00	42 Hours	18/11/2019 – 21/11/2019 16:20 – 09:50	LT4	69.4	93.0	54.4	70.9	64
Weekday Night-time 23:00 – 07:00	24 Hours	18/11/2019 – 21/11/2019 23:00 – 07:00		66.4	89.4	43.9	68.0	53
Daytime 07:00 - 19:00	1 Hour	19/11/2019 15:33	ST1	59.8	72.9	56.3	60.6	58.6
	1 Hour	19/11/2019 13:02	ST2	61.6	83.4	39.4	64.4	54.9
	1 Hour	19/11/2019 14:12	ST3	69.1	81.3	62.5	70.6	67.1
	15 Mins	20/11/2019 13:19	ST4	54.8	69.5	50.4	56.4	52.7
	1 Hour	19/11/2019 11:31	ST5	72.0	86.9	47.9	76.1	59.0
	15 Mins	20/11/2019 12:50	ST6	61.6	84.4	50.4	63.0	52.8



Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
	15 Mins	20/11/2019 14:01	ST7	70.5	86.0	54.1	74.9	56.8
	15 Mins	20/11/2019 15:09	ST8	62.9	79.0	58.9	64.1	61.0
Evening 19:00 - 23:00	15 Mins	20/11/2019 20:22	ST2	62.3	77.6	54.9	64.8	57.7
	15 Mins	20/11/2019 19:37	ST5	71.5	84.5	40.7	75.7	57.4
	15 Mins	20/11/2019 20:00	ST6	60.6	82.7	44.6	58.6	46.4
	15 Mins	20/11/2019 19:17	ST7	71.6	84.2	51.8	76.2	55.5
Night-time 23:00 - 07:00	30 Mins	21/11/2019 00:03	ST2	55.8	78.0	44.4	56.8	49.3
	15 Mins	20/11/2019 23:19	ST5	66.8	83.8	41.3	71.2	44.4
	15 Mins	20/11/2019 23:43	ST6	45.4	56.0	40.6	47.0	43.0
	15 Mins	20/11/2019 23:00	ST7	66.6	86.6	43.9	69.6	47.3

All values are sound pressure levels in dB re: 2×10^{-5} Pa



5.0 Assessment of Key Effects

5.1 ProPG Stage 1 Risk Assessment

Based on the modelled daytime $L_{Aeq,16hours}$ and night-time $L_{Aeq,8hours}$, SK02 and SK03 present noise contour plots during the day and night-time periods which provides a representation of the range of noise levels at the site. A summary of the Noise Risk Categories are presented below.

Table 5.1 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	ProPG Stage 1 Risk Assessment Noise levels
Daytime $L_{Aeq,16hr}$	Low to High
Night-time $L_{Aeq,8hr}$	Low to High

All values are sound pressure levels in dB re: 2×10^{-5} Pa

On the basis of the above, the Stage 1 risk assessment shows that the acoustic challenges at areas within the site are low to high risk and a good acoustic design process will be required to be followed at later design stages. Recommendations of how a good acoustic design can be achieved at the site are presented below.

5.2 Design Recommendations

Given the location of the site within proximity to the motorway network, there are various design measures which are recommended to present a good acoustic design.

Given the sites location next to the motorway network there will be areas within large parts of the site where the relevant BS 8233 criteria will be exceeded when windows are open. However, this is typical in such locations and mitigation can achieved through a suitable glazing and ventilation strategy which would be established during later design stages and would not be prohibitive.

Alternative ventilation can be provided in several ways from acoustic trickle vents (which need to have the same acoustic performance as the glazing), other passive ventilation systems or mechanical ventilations systems. The sound insulation performance of the units installed should be comparable to the glazing specification.

Generally standard double glazing would be acceptable within the site but for habitable rooms located within closer proximity to the adjacent motorways enhanced glazing may be required.



With regards to amenity in external private gardens, a noise criterion of 55 $\text{dBL}_{\text{Aeq},16\text{hours}}$ is considered to represent the target design noise level in gardens with the potential that higher levels of noise could be acceptable if a good acoustic design process is followed (See Section 2.2). In order to achieve this, screening to private external amenity areas will be required to the motorways and, to a lesser extent, Old Heywood Lane. Screening could comprise the installation of barriers or orientating buildings towards the motorways with gardens to the rear with care taken in the design to minimise pathways into the site in the 1st tier of buildings. The options would be dependent on various design requirements such as proposed ground levels and the distance of the residential premises to the motorway.

With regard to the distance of proposed residential premises to the motorways, it is recommended that a stand-off is included in the design. At this stage it is considered that a minimum stand-off of 50m from any motorway carriageway is included within the design which would allow for the attenuation of noise with distance and an area for any barriers such as close boarded acoustic fences or earth bunds to be constructed in the intervening space. If greater stand-off's are incorporated then this would be beneficial in terms of noise. In addition, whilst it would not be unreasonable to locate Public Open Space in such areas, it is also recommended that there should also be provision for POS more quiet / central parts of the site.

Other sources of noise

Regarding other sources of noise, no other sources of noise were observed to be present at the site during the noise survey. For aerial imagery, an artificial grass pitch is present at Parrenthorn High School which, at its nearest point is greater than 50m from the site boundary. The Sports England Artificial Grass Pitch (AGP) Acoustics – Planning Implications, New Guidance for 2015, states '*The determining noise criteria for AGPs proximity to residential properties, to avoid moderate annoyance in the daytime and evenings, as set by The World Health Organisation's 'Guidelines for Community Noise' = 50 dB $L_{\text{Aeq}(1 \text{ hour})}$ upper noise limit external to residential properties and within external living areas*' which is considered to represent the LOAEL. The document also states '*When a site is in an open location, noise levels of 50 dB $L_{\text{Aeq}(1 \text{ hour})}$ can be achieved at a distance of 40 m at 1.5 m above the ground but a distance of 70 m is required at a height of 30 m above the ground*'. Therefore, this is not considered to be a constraint, however, if higher storey apartments were considered in this location then further consideration may be required during the detailed design stage.

There are other isolated farmsteads located within or adjacent to the site boundary in the eastern parcel of the site. No noise from these premises was observed during the survey but a good design measure would be to not position dwellings or gardens immediately adjacent to the curtilage of such premises.



6.0 Conclusions

This report presents the findings of a desk based noise constraints assessment in relation to support the allocation of a site proposed for housing development located to the south of the M60 and M62 in Whitefield, Manchester.

Recommendations have been outlined within the report to support the Site Promotions and masterplanning of the site with this exercise establishing that the site is suitable for residential development. Consideration will need to be given to screening from the nearby motorways and, to a lesser extent, Great Heywood Road through the use of building orientation and / or barriers such as close boarded fences or earth bunds.

With regard to the distance of proposed residential premises to the motorways, it is recommended that a stand-off is included in the design. At this stage it is considered that a minimum stand-off of 50m from any motorway carriageway is included within the design which would allow for the attenuation of noise with distance and an area for any barriers such as close boarded acoustic fences or earth bunds to be constructed in the intervening space. If greater stand-off's are incorporated then this would be beneficial in terms of noise.

Generally standard double glazing would be acceptable within the site but for habitable rooms located within closer proximity to the adjacent motorways enhanced glazing may be required. Alternative ventilation will need to be considered within the parts of the site most exposed to road traffic noise. Such design measures are typical of development in similar areas within proximity to motorways or main roads and are not considered to be prohibitive.

Through the adoption of a good acoustic design process as the masterplanning of the site evolves, then it has been demonstrated that significant effects can be avoided.



Appendices



Appendix A – Acoustic Terminology and Abbreviations

Acoustic Terminology

- dB** Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.
- dB(A)** Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.
- L_{Aeq}** Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq, 07:00 - 23:00}$ for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the $L_{Aeq, 07:00 - 23:00}$.
- L_{Amin}** The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.
- L_{Amax}** The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.
- L_n** Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say, 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10, 1 hr} = x$ dB.
- The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90} , the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.
- R_w*** The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.



Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

AADT – Annual Average Daily Traffic

AAWT – Annual Average Weekday Traffic

WYGE – WYG Environment

PPG 24 – Planning Policy Guidance 24

NPPF – National Planning Policy Framework

NPPG – National Planning Practice Guidance

SOAEL – Significant Observed Adverse Effect Level

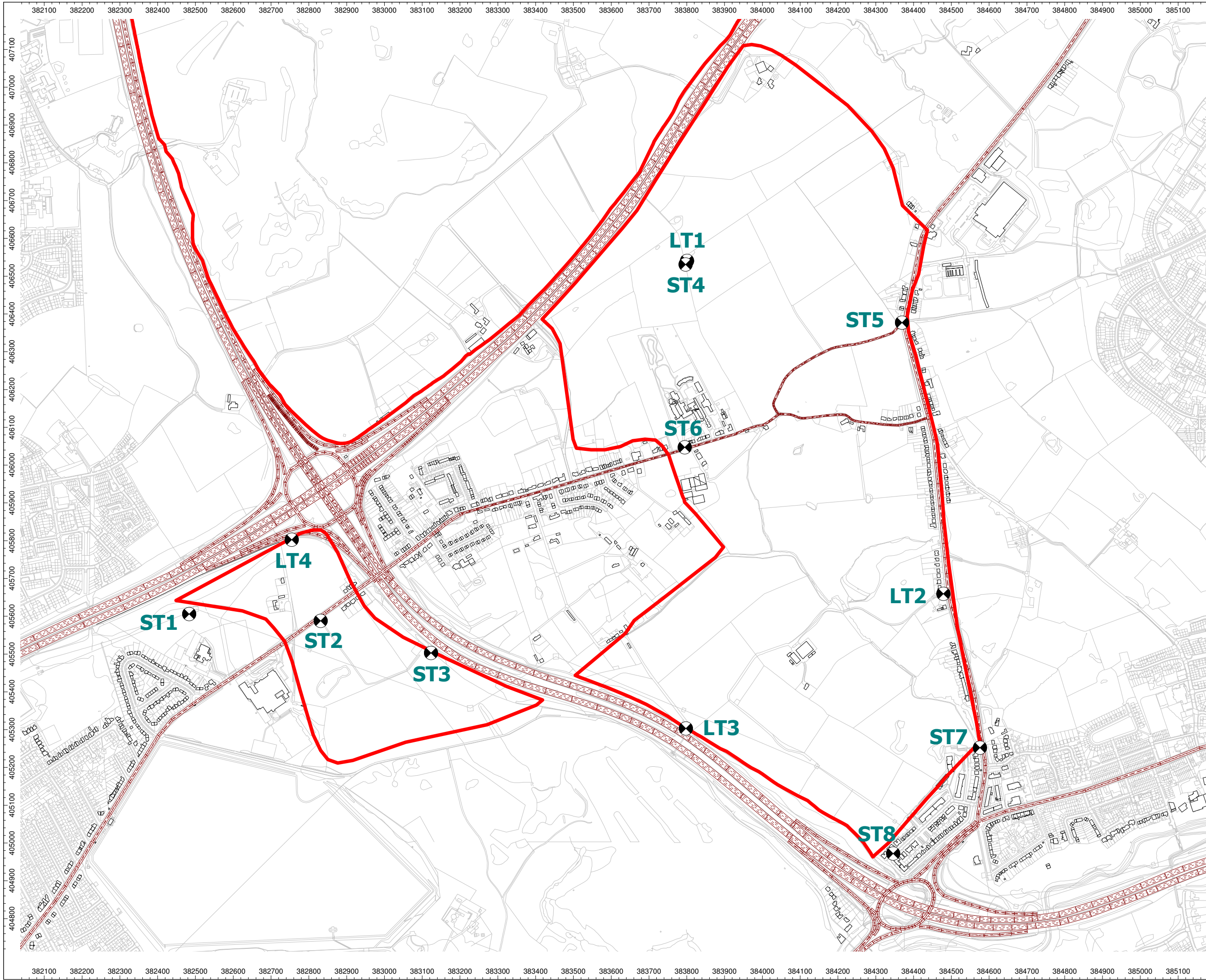


Appendix B – Sketches

SK01 Noise Monitoring Location Plan

SK02 ProPG Daytime Noise Contour Plot ($L_{Aeq,16hours}$)

SK03 ProPG Night-time Noise Contour Plot ($L_{Aeq,8hours}$)



Client:
Northern Gateway
Development Vehicle LLP

Project:
Northern Gateway

Project Number:
A104444-5

Drawing Title:
Noise Monitoring Location Plan

Drawing Number:
SK01

Key:
Site Boundary: —

Noise Monitoring
Locations: ●

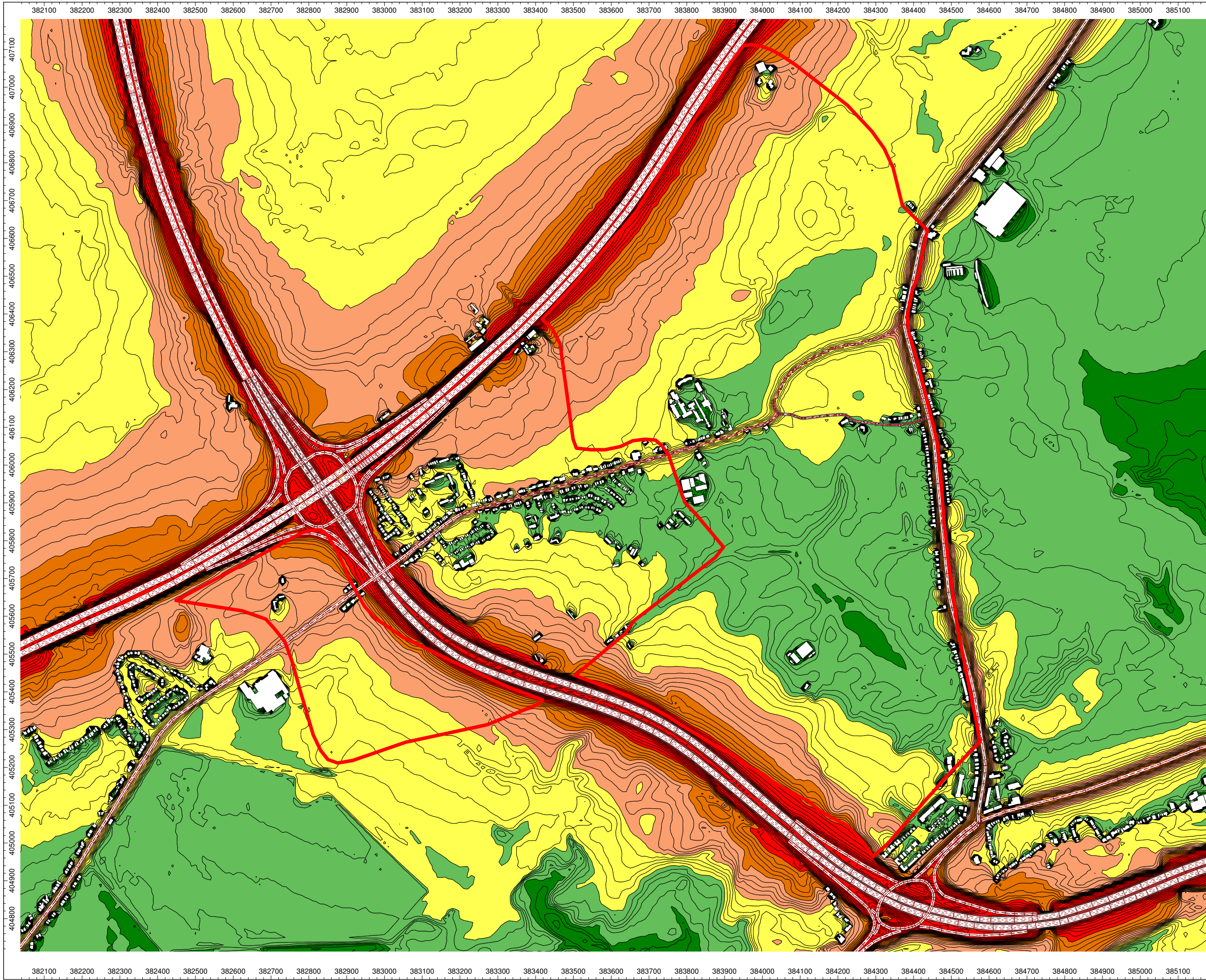
Scale : Not to scale

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Executive Park
Avalon Way
Anstey
Leicestershire
LE7 7GR
Tel 0116 234 8000

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Client:
Northern Gateway
Development Vehicle LLP

Project:
Northern Gateway

Project Number:
A104444-5

Drawing Title / Scenario:
ProPG Stage 1
Daytime LAeq,16hour
Noise Contour Plot

Drawing Number:
SK02

- Key:
- Site Boundary: —
 - 0.0 - 50.0 dB
 - 50.0 - 55.0 dB
 - 55.0 - 60.0 dB
 - 60.0 - 65.0 dB
 - 65.0 - 70.0 dB
 - >70 dB

Contour plot for indicative
purposes only.

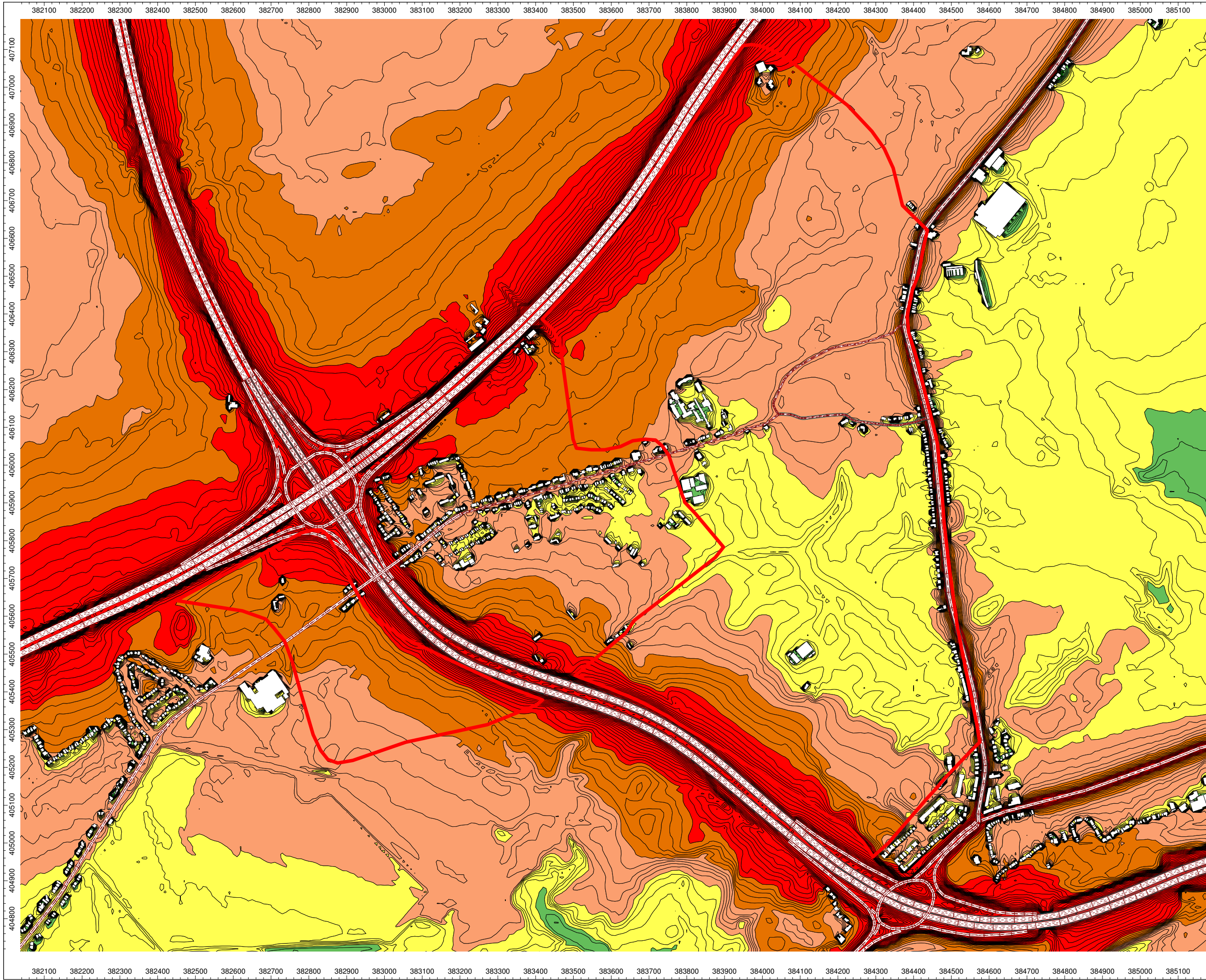
Scale : Not to scale

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Tel 0116 234 8000

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Client:
Northern Gateway
Development Vehicle LLP

Project:
Northern Gateway

Project Number:
A104444-5

Drawing Title / Scenario:
ProPG Stage 1
Night-time LAeq,8hour
Noise Contour Plot

Drawing Number:
SK03

Key:

- Site Boundary: —
- 0.0 - 40.0 dB
- 40.0 - 45.0 dB
- 45.0 - 50.0 dB
- 50.0 - 55.0 dB
- 55.0 - 60.0 dB
- >60 dB

Contour plot for indicative
purposes only.

Scale : Not to scale

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Appendix C – Report Conditions



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