



Greenfields Swords LRD

Acoustic Design Statement
09 June 2026

WDA250225RP_B_01

www.wdacoustics.com

Notice

This document is intended only for the use of Jackie Greene Construction Limited. The information and document are specifically for Greenfields Swords LRD, Swords Business Park, Greenfields, Co. Dublin and should not be reproduced, edited or copied in any form without the permission of Wave Dynamics. This document relates to the acoustic design elements of the project which Wave Dynamics were engaged on, it does not consider any of the other engineering services on the project including but not limited to fire, structural, mechanical and electrical design. Wave Dynamics assumes no responsibility to any other party arising in connection with this document and its contents.

Document Information

Project Name:	Greenfields Swords LRD
Address:	Swords Business Park, Greenfields, Co. Dublin
Project Number	WDA250225
Report Title	Acoustic Design Statement
Client	Jackie Greene Construction Limited

Document History

Revision	Status	Description	Author	Reviewer	Issue Date
A	Issued	Acoustic Design Statement			24/11/2025
			Joe Potter	James Cousins	
B	Issued	Acoustic Design Statement			09/06/2026
			Joe Potter	James Cousins	

Dublin Office

Wave Dynamics
Block 5 Airvista Park,
Swords Road,
Whitehall, Dublin 9,
D09 A3X2

Wexford Office

Wave Dynamics
Unit 14 Enterprise
Centre,
Gorey Business Park,
Ramstown Gorey,
Co Wexford, Y25 Y2C8

Cork Office

Wave Dynamics
Cube Building,
Monahan Rd,
Cork,
T12 H1XY

Phone (DUB/Wex): +353 (0)1 9125070

Phone (Cork): +353 (0)21 2032017

Phone (UK): +44 20 8157 2967

Email: info@wdacoustics.com

Web: www.wdacoustics.com

Executive Summary

Wave Dynamics were engaged by Jackie Greene Construction Limited as the acoustic consultants to provide an Acoustic Design Statement including an Inward Noise Impact for the planning application of the proposed new mixed-use development at Swords Business Park, Greenfields, Co. Dublin.

Inward Noise Impact Assessment

As part of the assessment to categorise the site, a baseline noise survey was undertaken to measure the existing noise levels. The development is bounded by the M1 motorway which dominates the noise levels in the area with Mantua Road contributing to the noise levels. Attended and unattended noise measurements were conducted across the site to establish the existing noise climate in the area.

Following the baseline noise survey a noise model of the existing road noise was produced and calibrated with the site measurements. A review of the noise levels on the site was conducted, this included the L_{AFmax} and L_{Aeq} , the site has subsequently been characterised as medium to high risk across the entirety of the site.

Consideration has also been given to the fact that the site lies approximately 4km from the edge of the Dublin Airport. Local measurement results have been included as have assessments of EPA airport noise maps to determine the impact from aircraft on the site. The dominant noise source is road traffic noise from the M1 motorway.

Break-in noise calculations to predict the internal noise levels from road traffic were conducted as part of the assessment. Consideration has also been given to the future growth of the roads. Following the assessment, the building envelope performance requirements were determined to achieve adequate internal noise levels. The performance specification for the building envelope has been provided in this report which includes the external walls, glazing of apartments and wintergardens, roof and ventilation requirements.

External Amenity Noise Levels

The external amenity spaces on the development include balconies and wintergardens for the apartments and Communal Open Spaces at ground and roof level and Public Open Spaces at ground level. Amenity has been provided in line with ProPG guidance on the development for residents using a combination of balconies on suitable facades, wintergardens and open communal amenity spaces at ground floor level. The creche open space at Block A is in line with ProPG guidance for the external amenity spaces. Communal Open Space 1-4, Public Open Space 3 as well as the wintergardens and balconies across the site are in line with element 3(v) of ProPG. Guidance set out in ProPG has been followed through an acoustic design strategy which considered the site layout and orientation as well as inclusion of wintergardens to provide adequate external amenity space.

Based on the recommendations in this report it is predicted that the internal and external noise levels will achieve the targeted noise levels in line with BS 8233:2014 and ProPG 2017 guidance.

Table of Contents

1	Introduction	1
1.1	Statement of Competence	1
2	Site Description	2
3	Project Criteria	3
3.1	Inward Noise Impact Assessment Criteria	3
4	ProPG Stage 1 – Assessment	10
4.1	ProPG Stage 1 – Initial Risk Assessment	11
5	Baseline Noise Survey	12
5.1.1	Site Description and Measurement Locations	12
5.1.2	Survey Methodology and Personnel	12
5.1.3	Survey Period	14
5.1.4	Noise Measurement Equipment	14
5.1.5	Subjective Noise Environment	14
5.2	Noise Measurement Results	15
5.2.1	Attended Measurement Results	15
5.2.2	Unattended Monitoring Results	15
5.2.3	L _{AFmax} Noise Levels	17
5.3	Weather Conditions for Monitoring Period	18
5.4	Future Noise Levels	18
6	ProPG Stage 2- Full Assessment	20
6.1.1	Good Acoustic Design Process	20
6.1.2	Discussion of Good Acoustic Design	20
6.2	Element 2 – Assessment of Internal Noise Levels	22
6.2.1	Noise Prediction Modelling	22
6.2.2	Predicted Road Noise Levels	23
6.2.3	Building Envelope Specification	27
6.3	Element 3- External Amenity Spaces	28
6.4	Element 4- Assessment of Other Relevant Issues	29
6.4.1	Compliance with Relevant National and Local Policy	29
6.4.2	Magnitude and Extent of Compliance with ProPG	30
6.4.3	Likely Occupants of The Development	30
6.4.4	Acoustic Design v Unintended Adverse Consequences	30
6.4.5	Acoustic Design v Wider Planning Objective	30
6.4.6	Provision of a Creche at Block A	30
6.5	Stage 2 Assessment Conclusion	30
7	Conclusion	31

Appendix A- Glossary of Terms	33
Appendix B- Façade Mark Ups	34
Appendix C- L_{day} , L_{eve} and L_{night} Noise Contours at 1.5m – 35m	35
Appendix D- 3D Model Façade Noise Map.....	63

1 Introduction

Wave Dynamics were engaged by Jackie Greene Construction Limited as the acoustic consultants to provide an Acoustic Design Statement including an Inward Noise Impact, for the planning application of the proposed new mixed-use development at Greenfields Swords LRD, Swords Business Park, Greenfields, Co. Dublin.

“The proposed development consists of a mixed-use development that constitutes a ‘Large-Scale Residential Development’ (LRD) at this site of 2.22 Ha principally located at Swords Business Park, Swords, Co. Dublin. The site is principally bound: to the north by an access road and ancillary car park to serve Swords Business Park; to the east by the M1 Motorway; to the south by Mantua Road; and to the west by an access road to serve Swords Business Park. The application site also extends to include parts of: the access road to the north and west for footpath, landscape and foul drainage connection works; Mantua Road to the west for foul drainage connection works; and the green strip to the south at Mantua Road for a pedestrian and cyclist connection.

Permission is sought for a mixed-use development with a gross floor area of 30,358 sq m and principally comprised in 5 No. blocks (A–E), with heights ranging from 1 No. to 9 No. storeys. The proposed block heights are as follows: Block A is 6 No. to 7 No. storeys; Block B is 6 No. to 7 No. storeys; Block C is 6 No. to 7 No. storeys; Block D is 6 No. to 9 No. storeys; and Block E is 1 No. to 9 No. storeys. The development consists of: 289 No. residential apartments (60 No. 1-bed, 200 No. 2-bed and 29 No. 3-bed); retail/commercial unit (701 sq m); and crèche (418 sq m) with outdoor play area (42 sq m).

Permission is also sought for: new multi-modal site entrance to the west; minor relocation of existing northern site entrance to the east; internal road, cycle and footpath network; 132 No. car parking spaces; 13 no. motorcycle parking spaces; cycle parking; hard and soft landscaping, including public open space, communal amenity space (at-grade and as roof gardens atop Block D and Block E) and incidental open space; private amenity space as balconies and terraces facing all directions; public lighting; bin stores; plant rooms; 2 No. sub-stations; green roofs; rooftop plant, PV panels, telecommunications infrastructure, lift overruns and automatic opening vents; and all associated works above and below ground”

Appendix A outlines a glossary of the acoustic terminology used in this report.

1.1 Statement of Competence

This report was completed by Wave Dynamics, an acoustic consultancy that specialises in noise and vibration. Our consultants have completed numerous similar projects in the Ireland the UK and Europe.

This assessment and report were completed by Joe Potter | Technical Engineer with Wave Dynamics who has experience in noise measurement surveys and assessments across a wide range of sectors including environmental, residential and commercial projects. Joe has an MA in Music Technology and has the IOA Postgraduate Diploma in Acoustics and Noise Control.

The peer review was completed by James Cousins, Managing Director | Principal Consultant with Wave Dynamics who has extensive experience in assessing noise impacts. James is an experienced acoustic consultant. His qualifications include; BSc (Hons) in Construction Management and Engineering, Pg Cert in Construction Law and Diploma in Acoustics and Noise Control (Institute of Acoustics) and an IOA Competence Cert in Building Acoustic Measurements. James is a member of both Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA) and is the current SITRI Chairman.

2 Site Description

The site is located at Swords Business Park, Greenfields, Co. Dublin. The main development site is bound to the north and west by Swords Business Park; to the east by the M1 Motorway; to the south by Mantua Road (L6310).



Figure 1: Measurement locations at A1, A2 and L1 and SEL1.

3 Project Criteria

The acoustic criterion for the project is set out in this section, the purpose of the criteria is to ensure reasonable:

- Internal noise levels, and;
- External amenity noise levels.

To provide adequate conditions Wave Dynamics have developed the project criteria for:

- Internal noise levels, and;
- External amenity noise levels.

Assessment Standards

The criteria for the project have been developed based on the following industry standards:

- ✓ BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.
- ✓ Dublin Agglomeration Environmental Noise Action Plan 2024 –2028.
- ✓ ProPG Professional Practice Guidance on Planning & Noise.
- ✓ ISO 1996-1:2016 Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures.
- ✓ Previous experience on similar projects.

3.1 Inward Noise Impact Assessment Criteria

The internal ambient noise levels requirements have been developed from the following standards:

Dublin Agglomeration Noise Action Plan

The Dublin Agglomeration Noise Action Plan 2024 – 2028 states the following with respect to the prevention of excessive noise levels for proposed new developments:

“Applications for new residential developments in the Agglomeration will be assessed in accordance with the policies and goals outlined in the relevant City and County Development Plans. Where applicable, these include adoption of the principles of Professional Planning Guidance (ProPG) on Planning & Noise: New Residential Development, as described in Section 7.5.1.

Where the assessment outcome determines the likelihood of an adverse noise impact, planning applications should be supplemented by an Acoustic Design Statement carried out by appropriately qualified acousticians and competent persons.”

ProPG: Professional Practice Guidance on Planning & Noise

ProPg 2017 is used to assess airborne noise from transport sources including road, rail and aircraft noise. The aim of the document is to provide a good design process which considers the internal acoustic environment at an early stage in the design process. The guidance was prepared by the Institute of Acoustics, the Association of Noise Consultants and the Chartered Institute of Environmental Health and is based on the findings by the World Health Organisation in relation to noise impact on humans. Its adoption is considered best practice for assessing the potential noise impact on the future occupants for residential developments.

The guidance is primarily designed for residential developments however it can be applied to other development types including developments where people require appropriate noise levels for rest and sleep. This includes residential care homes, hospitals etc. The guidance advocates a holistic design process which considers the site, its location and likely suitability for the development at an early stage.

The two primary stages of the ProPG design approach are summarised as follows:

Stage 1 – The first stage is to undertake an initial high-level noise risk assessment of the proposed site considering the noise levels (measured and or predicted) to identify any noise risks. This would include consideration of the current noise environment, future use and future noise levels; and,

Stage 2 –The second stage is a full detailed assessment of the proposed development covering the “*Four Key Elements*”:

1. *“Good Acoustic Design Process,*
2. *Internal Noise Level Guidelines,*
3. *External Amenity Area Noise Assessment; and*
4. *Assessment of Other Relevant Issues.”*

As part of the process an Acoustic Design Statement is produced and submitted to the planning authority. This document sets out the design process used to come to the conclusions and recommendations in the report.

Following the ProPg the following conclusions are recommended by ProPG in relation to the findings of the Acoustic Design Statement based on the recommendations of the Acoustic Consultant:

- a. *“Planning consent may be granted without any need for noise conditions;”*
- b. *“Planning consent may be granted subject to the inclusion of suitable noise conditions; “*
- c. *“Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”);*
or, “
- d. *“Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).”*

Section 3 of the ProPG outlines the recommended approach decision makers should following in coming to their conclusions based on the recommendations of the Acoustic Design Statement. Figure 2 on the next page illustrates the ProPG approach.

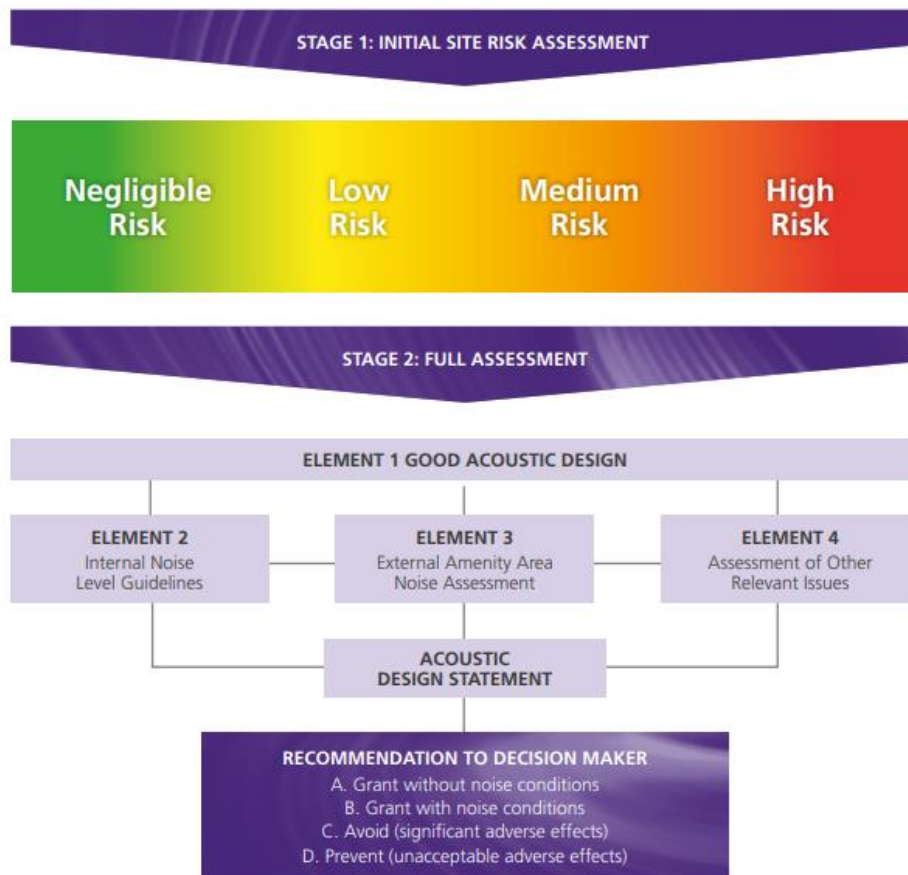


Figure 2: Summary of overall ProPG approach.

Internal Noise Levels

Table 1 below outlines the recommended internal noise levels from BS 8233:2014 within living accommodation for residential buildings for dining, resting and sleeping. These limits are in line with the ProPG and the World Health Organisation Guidelines.

Table 1: BS 8233:2014 internal noise criteria –Residential Buildings.

Activity	Location	07:00 to 23:00 Hrs	23:00 to 07:00 Hrs
Resting	Living Room	35 dB $L_{Aeq, 16 \text{ hour}}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq, 16 \text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16 \text{ hour}}$	30 dB $L_{Aeq, 8 \text{ hour}}$ 45dB L_{AFmax} (See Note 1)

1: Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB L_{AFmax} more than 10 times a night.

Fingal Development Plan 2023-2029 Policy on Aircraft Noise

The Fingal County Council Development Plan 2023-2029 sets out the current policy framework in relation to aircraft noise associated with Dublin Airport. This includes defined Aircraft Noise Zones (A-D) and corresponding development management standards, as outlined in Table 14.16: Aircraft Noise Zones of the Development Plan.

The proposed development is located outside of the lowest noise contour range for both daytime and nighttime periods, as identified in the Development Plan and outlined in Section 5.4 of this report. These zones represent the potential exposure of the site to aircraft noise during airport operations and inform the suitability of noise-sensitive development, including residential uses. The site is not deemed to be impacted by aircraft noise above the noise levels of road traffic from the M1.

Table 1 below (adapted from Table 8.1 and 14.16 of the Fingal Development Plan 2023-2029) outlines the development management objectives for each noise zone.

Table 2: Aircraft Noise Zone (Source: Fingal Development Plan 2023-2029, Table 8.1 & 14.16)

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
D	≥ 50 and < 54 dB $L_{Aeq, 16hr}$ and ≥ 40 and < 48 dB L_{night}	To identify noise sensitive developments which could potentially be affected by aircraft noise and to identify any larger residential developments in the vicinity of the flight paths serving the Airport in order to promote appropriate land use and to identify encroachment. <i>All noise sensitive development within this zone is likely to be acceptable from a noise perspective. An associated application would not normally be refused on noise grounds, however where the development is residential-led and comprises non- residential noise sensitive uses, or comprises 50 residential units or more, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed.</i> <i>Applicants are advised to seek expert advice.</i>
C	≥ 54 and < 63 dB $L_{Aeq, 16hr}$ and ≥ 48 and < 55 dB L_{night}	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise insulation is incorporated within the development <i>Noise sensitive development in this zone is less suitable from a noise perspective than in Zone D. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed.</i> <i>The noise assessment must demonstrate that relevant internal noise guidelines will be met. This may require noise insulation measures.</i> <i>An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the development's design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels.</i> <i>Applicants are strongly advised to seek expert advice.</i>

Zone	Indication of Potential Noise Exposure during Airport Operations	Objective
B	≥ 54 and < 63 dB $L_{Aeq, 16hr}$ and ≥ 55 dB L_{night}	To manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure noise insulation is incorporated within the development. <i>Noise sensitive development in this zone is less suitable from a noise perspective than in Zone C. A noise assessment must be undertaken in order to demonstrate good acoustic design has been followed.</i> <i>Appropriate well-designed noise insulation measures must be incorporated into the development in order to meet relevant internal noise guidelines.</i> <i>An external amenity area noise assessment must be undertaken where external amenity space is intrinsic to the developments design. This assessment should make specific consideration of the acoustic environment within those spaces as required so that they can be enjoyed as intended. Ideally, noise levels in external amenity spaces should be designed to achieve the lowest practicable noise levels.</i> <i>Applicants must seek expert advice.</i>
A	≥ 63 dB $L_{Aeq, 16hr}$ and/or ≥ 55 dB L_{night}	To resist new provision for residential development and other noise sensitive uses. <i>All noise sensitive developments within this zone may potentially be exposed to high levels of aircraft noise, which may be harmful to health or otherwise unacceptable. The provision of new noise sensitive developments will be resisted.</i>
Notes: • 'Good Acoustic Design' means following the principles of assessment and design as described in ProPG: Planning & Noise – New Residential Development, May 2017; • Internal and External Amenity and the design of noise insulation measures should follow the guidance provided in British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'		

Having regard to Table 8.1 and 14.16 of the Fingal County Council Development Plan 2023-2029, and the location of the site being outside of Aircraft Noise Zones (A-D), the proposed Large-Scale Residential Development has been designed to comply with all relevant aircraft noise policies and development management strategies. Appropriate internal noise levels are achievable, good acoustic design principles have been applied, and external amenity areas have been designed with regard to acoustic design principles. The proposed development is therefore consistent with the Development Plan objectives for managing noise-sensitive developments.

Additional policies and objectives outlined in the Fingal Development Plan 2023 – 2029 are included below:

- **DAP 5 – Noise**
 - Support the actions contained within the Noise Action Plan for Dublin Airport (2019-23), or any subsequent plan or extension of same.
- **DAP 6 – Health of Residents and Aviation Noise**
 - Protect the health of residents affected by aviation noise, particularly night-time noise.
- **DAO 11 – Requirement for Noise Insulation**
 - Strictly control inappropriate development and require noise insulation where appropriate in accordance with table 8.1 above within Noise Zone B and Noise Zone C and where necessary in

Assessment Zone D, and actively resist new provision for residential development and other noise sensitive uses within Noise Zone A, as shown on the Development Plan maps, while recognising the housing needs of established families farming in the zone. To accept that time based operational restrictions on usage of the runways are not unreasonable to minimise the adverse impact of noise on existing housing within the inner and outer noise zone.

The above policies have been addressed throughout this report.

Noise Action Plan (NAP) for Dublin Airport 2024 - 2028

The Noise Action Plan for Dublin Airport (2024 – 2028) outlines the following objective in relation to the noise abatement objectives for aircraft noise:

“Limit and reduce the long-term adverse effects of aircraft noise on health and quality of life, particularly at night, as part of the sustainable development of Dublin Airport.”

The plan primarily focuses on the outward noise impact and encroachment of the airport activities on the existing uses of nearby lands. The consideration of the noise impacts from aircraft noise on residential amenity is considered in more detail in the Dublin Agglomeration Noise Action Plan.

External Amenity Space Noise Levels

With regard to noise levels in external amenity spaces ProPG 2017 refers to the BS8233:2014 guidance which states that:

“the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq, 16hr}$ ”.

It also states that:

“These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited.”

After mitigation/with mitigation if the adverse noise impacts are still above the recommended noise levels, they can be offset by providing an alternative amenity space to partially offset the noise impact by providing access to:

- *“a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.”*

BS 8233:2014 elaborates on this further, it acknowledges that it may not always be necessary or feasible to ensure that noise levels remain within the guideline values. In respect of gardens and patios, BS 8233:2014 states:

“however it is also recognized that these guideline values are not achievable in all circumstances where development might 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 the 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.”

Both BS8233:2014 and ProPG 2017 do not advise that development should be restricted in areas with undesirable noise levels. The standards recommend that mitigation measures are put in place where practicable to achieve the recommended noise levels for the external amenity spaces. It notes that this may not be practical in all situations and local or governmental policy should take precedence in these situations.

4 ProPG Stage 1 – Assessment

The stage one risk assessment is used to assess the site for potential risks that may occur in terms of noise impact. The ProPG sets out four categories of risk: 1) negligible, 2) low, 3) medium or 4) high risk. Figure 2 below illustrates the ProPG risk assessment and the values associated with each risk category.

The risk assessment also considers the risk based on the number of L_{AFmax} events per night as follows;

- A site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and;
- A site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times per night.

Paragraph 2.9 of ProPG states that,

“The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a “typical worst case” 24 hour day either now or in the foreseeable future.”

To assess the noise impact with the ProPG risk categories a baseline noise survey was undertaken on the site to quantify the existing noise environment.

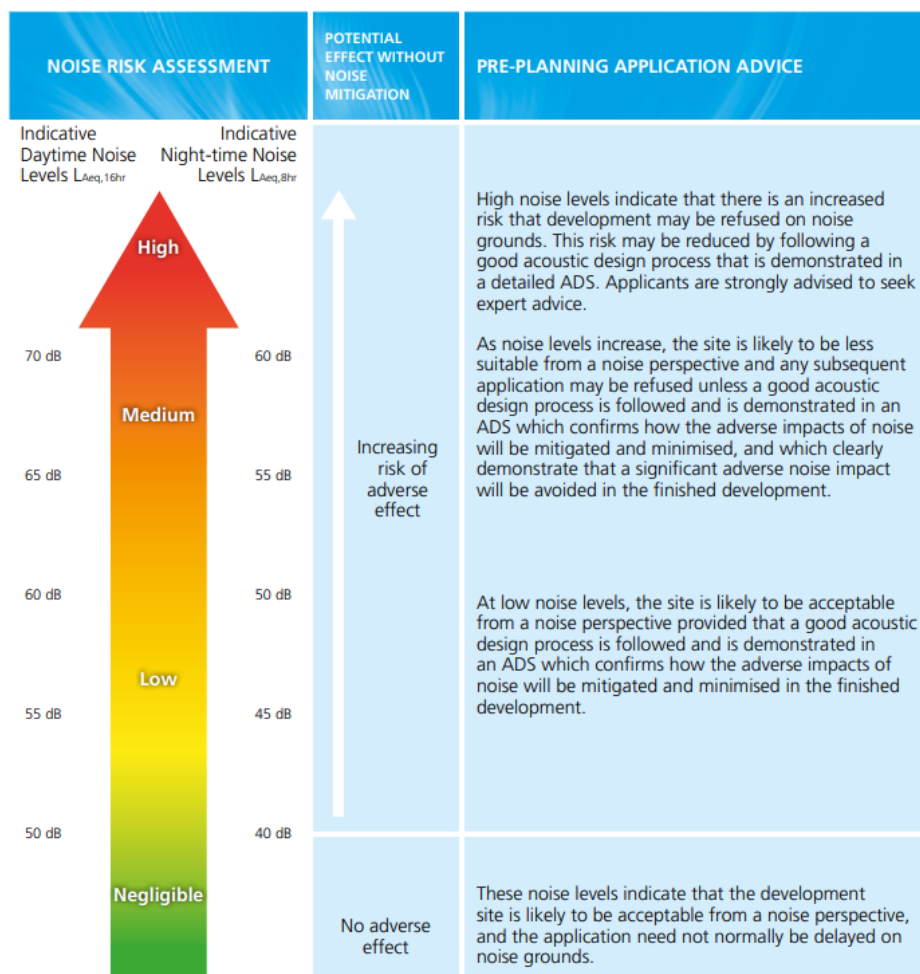


Figure 3: ProPG Risk Analysis

4.1 ProPG Stage 1 – Initial Risk Assessment

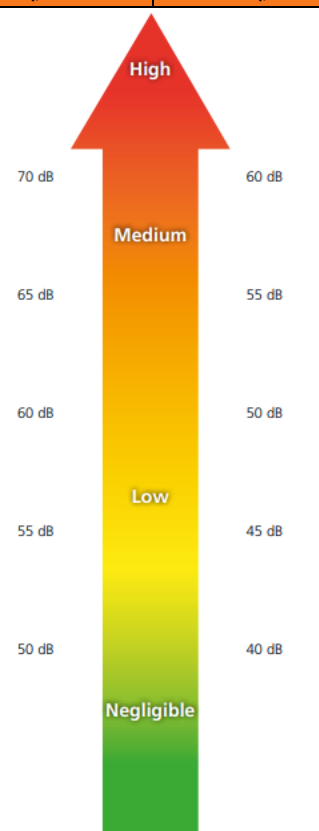
The measured noise levels on the site have been predicted for the existing road traffic noise to assess the probability of an adverse impact.

Table 3 below identifies the Noise Risk Categorisation of the site based on the predicted free field façade noise levels. The site has been categorised as medium/high risk for the existing noise levels at the site. The glazing and ventilation element specifications to achieve required internal noise levels are outlined in Section 6.2.3.

It should be noted that the ProPG 2017 states the following with regard to how the initial site noise risk is to be used:

“2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design.”

Table 3: ProPG Stage 1 Risk Assessment of Existing Noise Levels

Noise Risk Assessment		Risk Assessment Rating	
Indicative Daytime Noise Levels $L_{Aeq,16hour}$	Indicative Night-time Noise Levels $L_{Aeq,8hour}$	Daytime Noise Levels	Night-time Noise Levels
		High Risk	High Risk
		The majority of the site is at medium/high risk. Good Acoustic design should be demonstrated.	The majority of the site is at medium/high risk. Good Acoustic design should be demonstrated.
		Medium Risk	Medium Risk
		The majority of the site is at medium/high risk. Good Acoustic design should be demonstrated.	The majority of the site is at medium/high risk. Good Acoustic design should be demonstrated.
		Low Risk	Low Risk
		N/A.	N/A.
		Negligible Risk	Negligible Risk
		N/A.	N/A.

5 Baseline Noise Survey

A baseline noise survey was conducted on the development lands at Greenfields Swords LRD, Greenfields, Swords, Co. Dublin to assess the impact of surrounding noise sources. The purpose of the survey was to quantify the existing noise environment at the site from road traffic and to establish the existing background noise levels in the area.

This section outlines the results of the survey, the measurement procedure and the equipment used. The attended noise measurements were undertaken on the 23rd of April 2025 and the 25th of April 2025. The unattended survey was conducted from the 23rd of April 2025 at 17:51hrs to the 25th of April 2025 at 09:02hrs.

5.1.1 Site Description and Measurement Locations

The site is principally located at Swords Business Park, Greenfields, Co. Dublin. The main development site is generally bound to the north and west by Swords Business Park; to the east by the M1 Motorway; to the south by Mantua Road (L6310).



Figure 4: Site location and measurement locations L1, A1 and A2 and SEL1.

5.1.2 Survey Methodology and Personnel

The baseline noise survey was completed by Cathal Reck (Acoustic Consultant) and Joe Potter (Technical Engineer). The attended noise measurements were undertaken on the 23rd of April 2025 and the 25th of April 2025. The unattended survey was conducted from the 23rd of April 2025 at 17:51hrs to the 25th of April 2025 at 09:02hrs.

Unattended Noise Measurements

An unattended noise logger was deployed in location L1. The monitor was deployed on the 23rd of April 2025 at 17:51hrs to the 25th of April 2025 at 09:02hrs. The logger was positioned approximately 4m above the ground. The logger was calibrated before and after the measurements and no significant drift was noted. Measurements were filtered for periods of unsuitable weather conditions (where appropriate).



Figure 5: Unattended measurement setup

Attended Noise Measurements

Noise measurements were undertaken in general accordance with ISO 1996-1:2016 using ISO Class 1 sound analysers. Attended measurements were taken for a duration of 15 minutes in the locations A1, A2, and L1 as noted in Figure 4. Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration, or interference. During the attended noise measurements, the sound level meter was positioned at approximately 1.5m above the ground level for positions A1 and A2, and 3m for L1. The weather conditions were calm (wind less than 5m/s) with negligible rain, a wind shield was used for the duration of the attended surveys. The noise logger was calibrated before and after the survey and no significant drift was noted.



Figure 6: Attended Measurement Setup.

5.1.3 Survey Period

The unattended noise measurements were undertaken from the 23rd of April 2025 at 17:51hrs to the 25th of April 2025 at 09:02hrs. Attended noise measurements were conducted on the 23rd of April 2025 and the 25th of April 2025.

5.1.4 Noise Measurement Equipment

A Class 1 sound level meter/noise logger in general accordance with IEC 61672-1:2013 was used for the attended measurements. Table 4 summarises the measurement equipment used.

Table 4: Noise Measurement Equipment

Description	WD Asset Number	Model	Serial No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter ¹	SLM1	Nor 140	1405554	U45343/U45344 /U45342	27/07/2025
Calibrator ¹	CAL1	Nor 1251	31056	AC240268	09/10/2025
Sound Level Meter ²	SLM2	NOR140	1406532	SLM230218	27/09/2025
Calibrator ²	CAL3	Nor 1251	32096	AC240251	03/07/2025

1) Equipment used for the surveys conducted on 23rd – 25th of April 2025.

2) Equipment used for the indicative SEL survey conducted on 3rd of December 2024.

5.1.5 Subjective Noise Environment

During the attended noise survey, the following noise sources were identified:

- Road traffic noise from M1 Motorway, R132 and Mantua Road.
- Road traffic from nearby business park.
- Birdsong.

5.2 Noise Measurement Results

Attended and unattended measurements were taken to measure the noise levels across the site. This section outlines the results of the attended noise measurements.

5.2.1 Attended Measurement Results

Table 5 outlines the results of the attended measurement survey.

Table 5: Attended Noise Measurement Results

Measurement				Measured Noise Levels		
Location	Date	Time (hrs)	Duration (mins)	L _{Aeq} dB	L _{AFmax} dB	L _{A90} dB
A1	23/04/2025	15:52	15	66	74	64
A2	23/04/2025	16:12	15	67	73	64
A2	23/04/2025	16:57	15	68	73	66
L1	25/04/2025	09:06	15	70	76	67
A2	25/04/2025	09:52	15	66	73	64
A1	25/04/2025	10:15	15	65	72	63

Aircraft Sound Exposure Measurement Results

Table 6 outlines indicative local levels of aircraft noise for the development at Greenfields, Swords taken from the results of the attended measurements for aircraft flyover noise levels at Swords Business Park, Seatown Road, Swords, Dublin taken on the 3rd of December 2024. The noise levels from road traffic noise were too high to allow accurate noise measurement of aircraft flyovers at the proposed Greenfields, Swords development therefore these measurements were taken on the adjoining lands.

The sound exposure level (SEL) from aircraft flyovers has been calculated using the following equation:

$$L_{AX} = L_{Aeq} - 10 \cdot \log_{10}(N) + 10 \cdot \log_{10}(T)$$

Where:

L_{Ax} measured SEL

N number of vehicle movements

T time (seconds)

Table 6: Aircraft Flyover Noise Levels

Measurement				Aircraft Type	Measured Noise Levels		Sound Exposure Level
Location	Date	Time (hrs)	Duration (s)		L _{Aeq} dB	L _{AFmax} dB	L _{AX} dB
SEL1	03/12/2024	11:38	42	Boeing 767-332	60	64	76
SEL1	03/12/2024	11:42	22	Airbus A320-251N	58	63	72
SEL1	03/12/2024	11:48	19	Boeing 737 MAX 8-200	61	64	74

5.2.2 Unattended Monitoring Results

Table 7 outlines the results of noise measurements at the unattended monitoring location L1. The noise logger was positioned 4m above ground level.

Table 7: Unattended Measurement Results

Start Date	L _{Aeq,16hour} 07:00 - 23:00 dB	L _{night} (L _{Aeq,8hour} 23:00 - 07:00) dB ²	L _{den} (00:00 - 00:00) dB	10th highest night-time L _A Fmax dB	L _{A90} (23:00 - 07:00) dB
23/04/2025	66 ¹	62	70 ¹	73	55
24/04/2025	68	64	71	74	56

(1) Incomplete measurement duration

(2) Where night-time period is referred to the date is the date the measurement commenced on at 23:00hrs and finished at 07:00hrs on the following calendar day.

Aircraft Noise

Local SEL measurements and assessment of the EPA airport noise maps have been used to predict the impact of aircraft noise on the site. The proposed site is located outside of the EPA aircraft noise contour for the lowest noise levels and measured noise levels on site are dominated by road noise from the M1, subsequently, indicative SELs have been used to determine the impact of aircraft noise on the site. The site is not deemed to be impacted by aircraft noise above the noise levels of road traffic from the M1.

Figure 7 and Figure 8 below outline the proposed noise contours for the day and night periods for 2025. It can be seen from the EPA contours that the site location will be outside of the lowest noise contour range for both daytime and nighttime periods. Consideration has been given to these contours throughout the assessment.

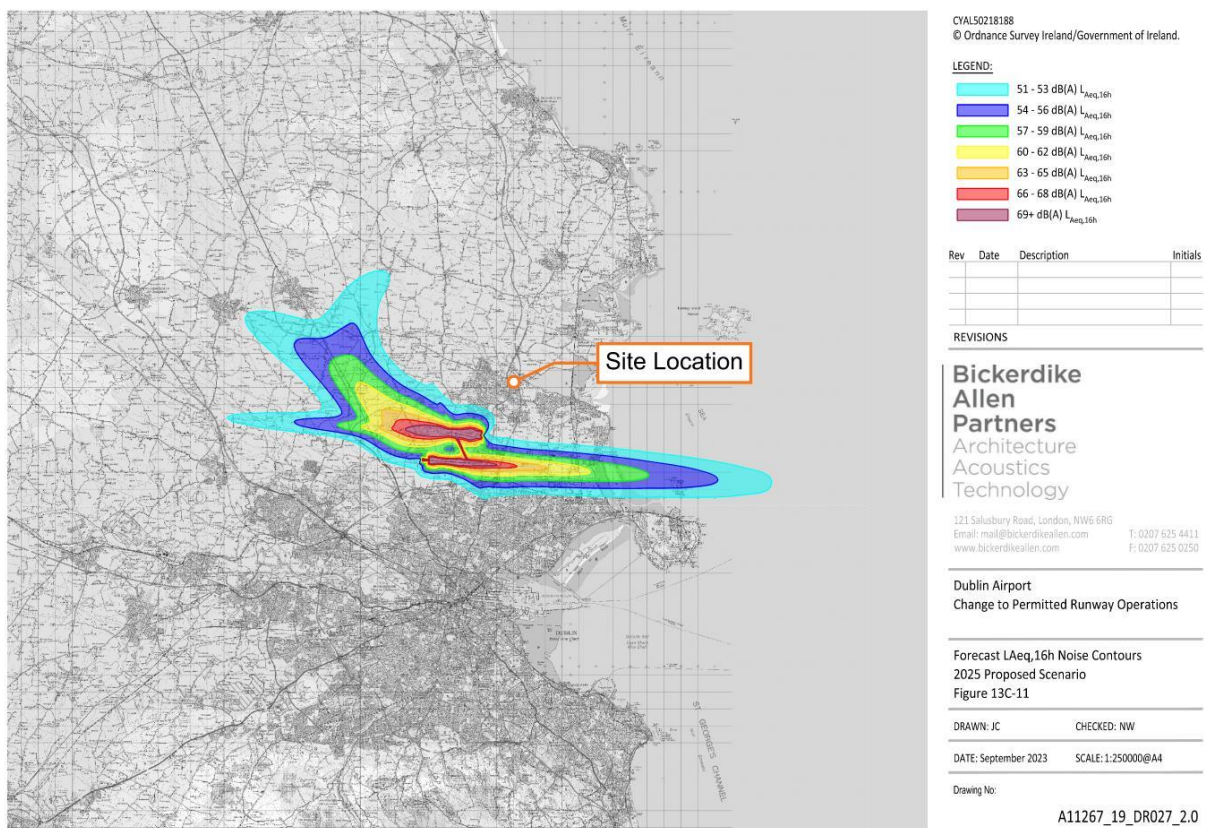


Figure 7: L_{Aeq,16hr} contours proposed for Dublin Airport noise emissions 2025.

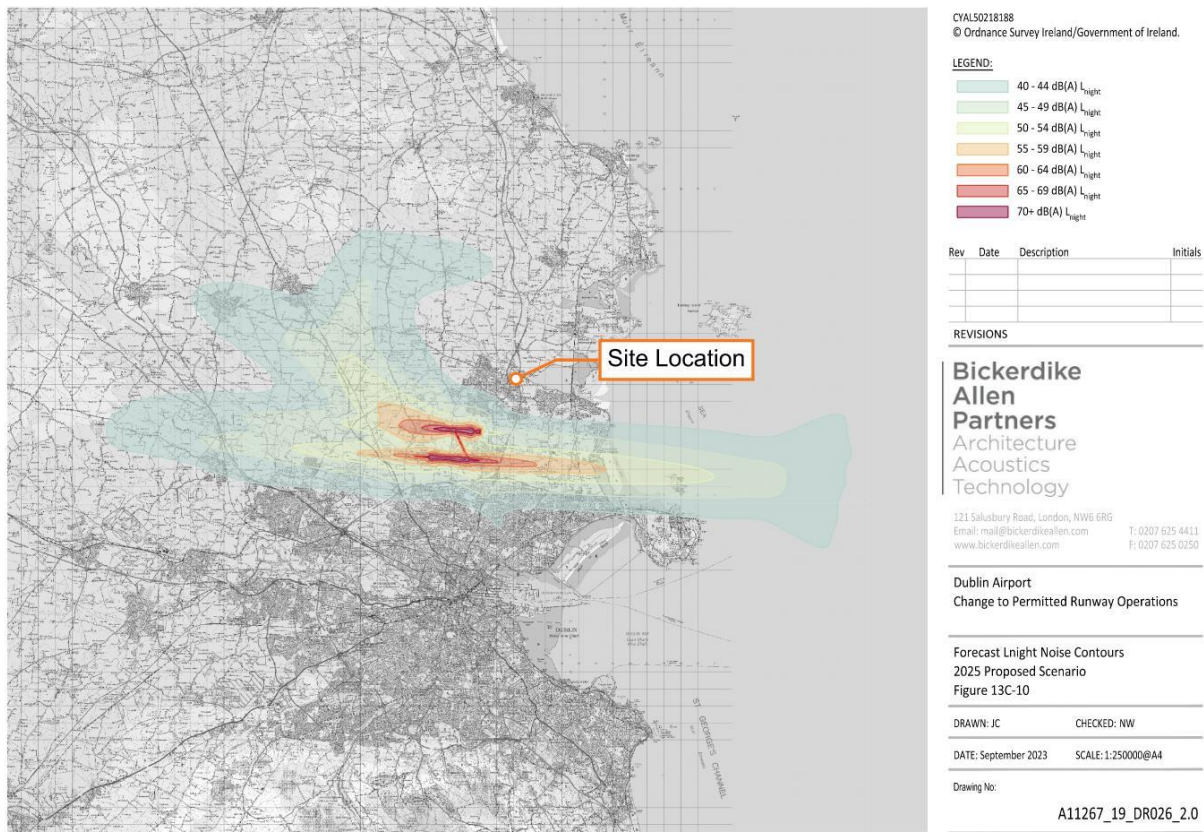


Figure 8: $L_{Aeq,8hr}$ contours proposed for Dublin Airport noise emissions 2025.

5.2.3 L_{AFmax} Noise Levels

Based on the project criteria outlined in Section 3, the internal $L_{AFmax 15min}$ inside the dwelling bedrooms cannot exceed 45dBA more than 10 times per night. With regard to the maximum noise levels ProPg states:

“A site should not be regarded as negligible risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 60 dB more than 10 times a night. A site should be regarded as high risk if the $L_{Amax,F}$ exceeds, or is likely to exceed 80 dB more than 20 times a night.”

Figure 9 highlights the average number of L_{AFmax} events recorded on the noise logger per night based on a 15min measurement interval. Based on the ProPG risk assessment of the L_{AFmax} noise levels, the site is not considered high risk as there are not typically more than 20 occurrences exceeding 80dB L_{AFmax} .

The façade specification outlined in 6.2.3 has been determined in accordance with achieving the internal noise levels for both L_{Aeq} and the L_{AFmax} incident noise levels.

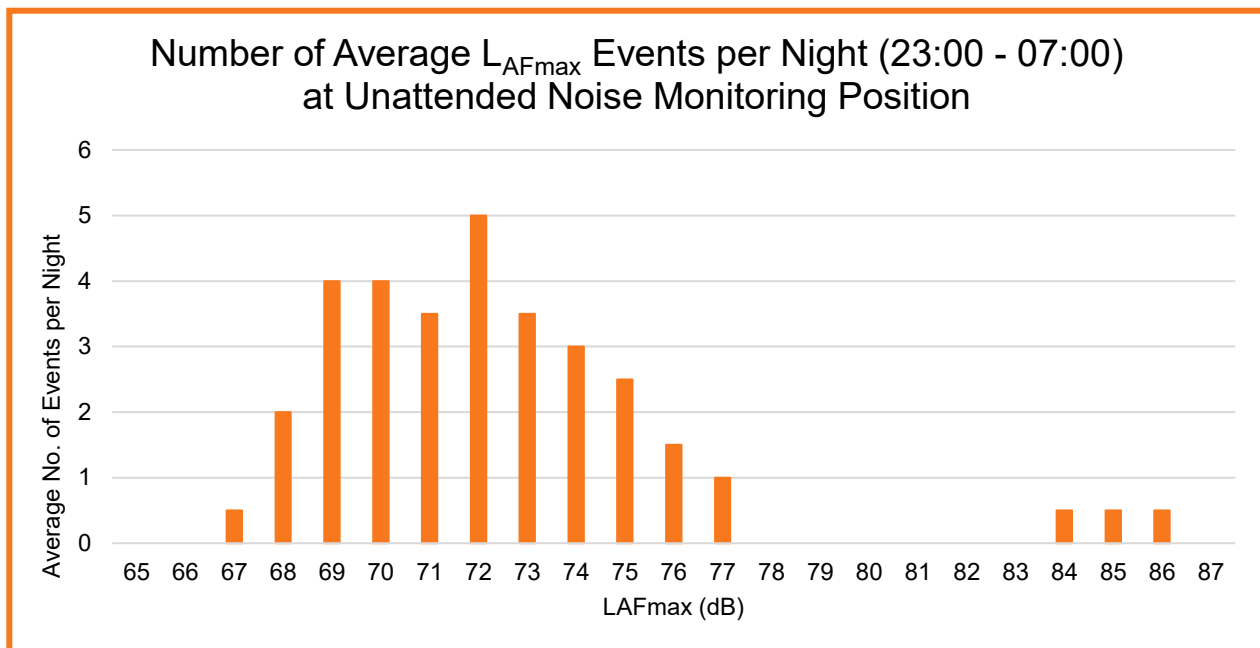


Figure 9: Average recorded L_{AFmax} events per night based on 15min measurement intervals.

Discussion of Measurement Results

The measurements were taken on a weekday period to provide an accurate understanding of the noise climate during busier times. From the noise levels recorded there, the dominating noise sources included passing traffic along the M1 Motorway.

Based on the ProPG risk assessment of the L_{AFmax} noise levels, the site is not considered high risk as there are not typically more than 20 occurrences exceeding 80dB L_{AFmax} .

5.3 Weather Conditions for Monitoring Period

Good weather conditions were noted in general during the deployment and collection during the attended survey, with winds of less than 5 m/s and negligible rain for the attended surveys.

Where whether conditions may have impacted the results of the unattended measurement survey, results were filtered where required. Due to reduced data from the 25th of April 2025, this day has not been included in the unattended measurement table.

5.4 Future Noise Levels

Road Noise

Based on data from the TII (2017) the average rate of growth on Irish roads is 3.9%. Assuming linear growth of 3.9% over the next 10 years an increase in noise levels from road traffic of 2dB would be expected. WDA have allowed for this growth in our assessment.

At the time of the assessment, we are not aware of any additional upgrades to local roads which may cause an increase on the noise impact on the future development.

Aircraft Noise

Consideration has also been given to the fact that the site lies approximately 4km from the edge of the Dublin Airport. Local SEL aircraft measurements were taken at a representative location that is less impacted by road noise from the M1 than Greenfields, Swords to gain an understanding of aircraft noise impacts on the site. These measurements as

well as an assessment of EPA noise maps have been used to predict the impact of aircraft noise. From this study it has been established that the dominant noise source on the site is from the M1 motorway.

6 ProPG Stage 2- Full Assessment

This section outlines the full acoustic design assessment in line with ProPG guidance.

6.1.1 Good Acoustic Design Process

ProPg States the following in relation to Good Acoustic Design Process:

“A good acoustic design process takes a multi-faceted and integrated approach to achieve optimal acoustic conditions, both internally (inside noise-sensitive parts of the building(s)) and externally (in spaces to be used for amenity purposes).”

“Good acoustic design should avoid “unreasonable” acoustic conditions and prevent “unacceptable” acoustic conditions (these terms are defined in Element 2). Good acoustic design does not mean overdesign or gold plating of all new development but seeking to deliver the optimum acoustic outcome for a particular site”

The following considerations are recommended by ProPG:

- *“Check the feasibility of relocating, or reducing noise levels from relevant sources.*
- *Consider options for planning the site or building layout.*
- *Consider the orientation of proposed building(s).*
- *Select construction types and methods for meeting building performance requirements.*
- *Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc.*
- *Assess the viability of alternative solutions.*
- *Assess external amenity area noise.”*

6.1.2 Discussion of Good Acoustic Design

Mitigation of Sources

The proposed development is located in close proximity to road traffic noise sources associated with the adjacent road network. These noise sources are external to, and not part of, the proposed development. As such, it is not feasible to reduce, modify, or relocate these sources as part of the project.

The surrounding road infrastructure is elevated relative to the development site, which further increases the propagation of traffic noise across the area. The elevated alignment allows noise to travel more freely over the intervening terrain, reducing the effectiveness of standard on-site mitigation measures.

The installation of noise barriers was considered as a potential mitigation strategy. However, for a noise barrier to be effective, it must be located close to either the noise source or the receptor in order to break the line of sight and achieve meaningful attenuation.

To achieve effective screening, the barrier would need to be positioned adjacent to the road itself. Given the height and configuration of the road, this would require installation along the roadside at an elevated level. Such an approach presents significant practical and logistical challenges, including restricted access to the roadside verge, potential safety risks associated with working adjacent to a high-speed roadway (e.g. the M1), and the need for traffic management measures. Additionally, third-party land ownership and statutory constraints may further limit the feasibility of implementing such mitigation measures. This would require access to the M1 to carry out the construction works which was not considered feasible and discussed with FCC during the LRD pre-application process.

For these reasons, the provision of noise barriers in this location is not considered a practicable or effective mitigation option.

Site Layout and Orientation

The M1 Motorway is a major contributor to the noise levels in the area. The proposed apartment blocks provide screening to the apartment units located on the central area of the proposed development and also the external amenity spaces towards the centre of the development. Throughout the design development process, the site layout has been considered to offer the best possible screening for external amenity spaces. This has included developing different options for the site to mitigate noise prior to agreeing on the final layouts. Consideration was given to the location of noise barriers and the practicalities of the noise barriers. Due to the location of the site and the height of the adjoining roads it was found that the use of a noise barrier was not practical,

The design interventions incorporated within the acoustic strategy have been developed to respond to both the constraints of the site and the surrounding noise environment, with a focus on minimising noise exposure to sensitive receptors and improving the overall acoustic performance of the scheme. A key element of this approach is the inclusion of a single-storey building element positioned between blocks D and E. This structure is intended to act as a physical acoustic barrier, interrupting the direct line of sight between noise sources and receptors, and thereby reducing the propagation of airborne sound.

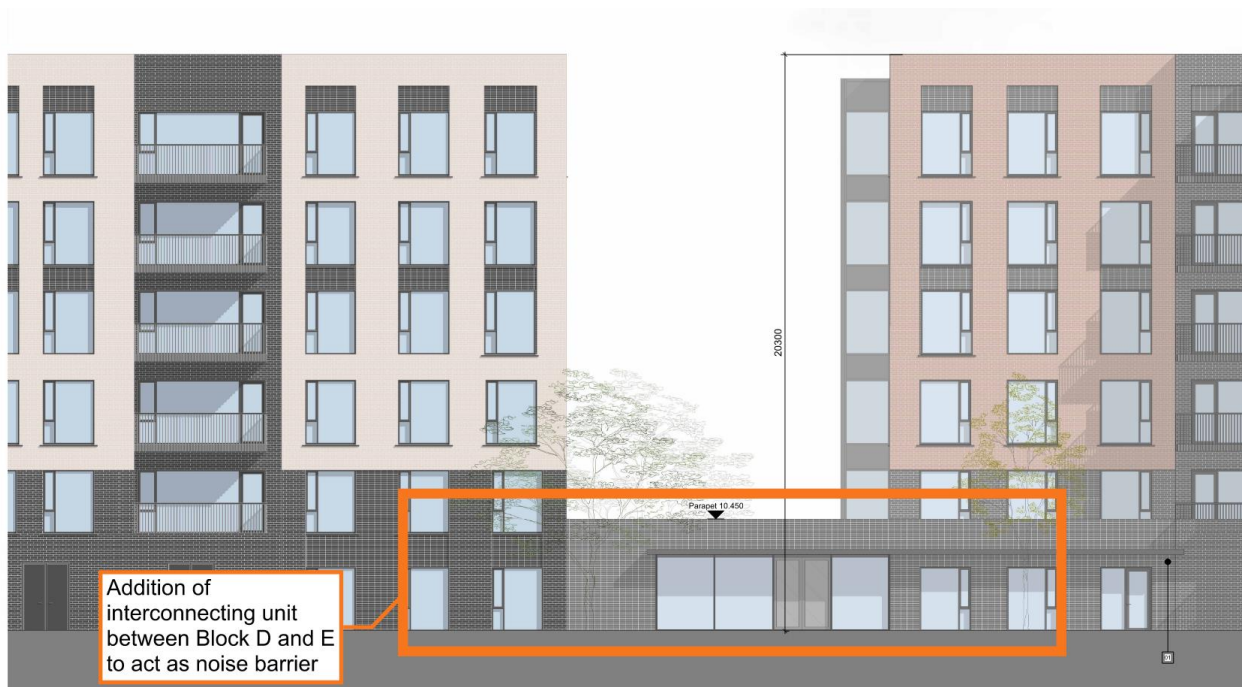


Figure 10: Single storey building added between Block D and E acting as a noise barrier for Public Open Space 3

In addition to built form interventions, the orientation of the development has been considered as a fundamental aspect of the acoustic design. Amenity spaces, including terraces, balconies or courtyards, are positioned to benefit from this shielding effect, reducing their exposure to external noise and creating more suitable environments for occupants. This approach also allows the building envelope itself to act as a barrier, limiting the ingress of noise into internal spaces and supporting compliance with relevant acoustic criteria. Together, these interventions demonstrate a coordinated design response that integrates acoustic considerations into the overall layout and massing of the development, rather than relying solely on secondary mitigation measures.

Construction Methods

Section 6.2.3 considers the construction methods required to meet the building performance control measures. The construction measures are in general robust, providing standard external wall and façade details to meet thermal, fire and weathertightness requirements will in general provide adequate performance to achieve good levels of sound insulation.

Impact of Noise Control Measures

The effects for noise control measures on other building elements including ventilation are considered in Section 6.2.3. It is generally impractical to provide ventilation via openable windows in urban/built up areas. An open window

will provide 10-15dB of attenuation which in built-up urban and suburban areas is not practical. ProPG makes reference to specific cases in suburban areas where the development is beside a transport link. In general, the good acoustic design process in these areas is to provide ventilation via attenuated natural vents or mechanical ventilation. This allows the occupants to have adequate ventilation with adequate noise levels.

External Amenity

ProPG states the following with regard to external amenity spaces:

“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$.”

The external amenity source noise levels are considered in section 6.3.

6.2 Element 2 – Assessment of Internal Noise Levels

This section outlines the assessment of the building envelope including the façade noise modelling, and specification of the glazing requirements.

A noise intrusion assessment for the proposed development has been completed in accordance with the methodology outlined International Standard *ISO EN 12354-3:2017 Building acoustics — Estimation of acoustic performance of buildings from the performance of elements — Part 3: Airborne sound insulation against outdoor sound*. The standard provides a method for calculating the indoor noise levels due to for instance road traffic noise.

The calculation method accounts for multiple factors including:

- The external noise level at the affected building façade.
- The frequency characteristics of the specific noise source (i.e. road traffic noise).
- The sound insulation performance of each façade element (i.e. Windows, Walls, Roof...).
- The area of each façade element.
- Direct and flanking transmission paths.

6.2.1 Noise Prediction Modelling

Following the survey, a computational noise model of the development using SoundPLAN 9.1 modelling software was developed to establish the noise levels from the development in a worst-case scenario. The software implements the algorithms contained in ISO 9613-1 and ISO 9613-2. The noise model considers:

- Distance attenuation,
- Source and receptor locations,
- Barrier effects (buildings, walls etc)
- Topographical elevations,
- Ground effects and absorption,
- Source sound power levels,
- Directivity and orientation of the source,
- Atmospheric attenuation and meteorological effects,

The noise model has been calibrated against the attended and unattended noise measurements. SoundPLAN 9.1 software predicts road traffic noise levels in accordance with *Calculation of Road Traffic Noise* (UK Department for Transport, 1998). This is the recognised appropriate standard for road traffic noise prediction as per TII (Transport Infrastructure Ireland).

The following information was input into the model:

- Development layout provided by architect's drawings.
- Google Maps terrain and elevation data of surrounding area.
- Traffic speeds as per local signage and onsite observation.
- Assessment conducted during peak traffic times.
- Percentage of HGV assumed at 4% based on assessment of similar local roads.

- Annual traffic growth rate of 3.9%.
 - This has been assessed based on pre-covid traffic growth data.

6.2.2 Predicted Road Noise Levels

Incident road traffic noise levels have been predicted across all facades of the development for both the day and nighttime period. The elevation heights have been predicted according to the proposed storey heights given in the site layout. Appendix C and Appendix D display noise contours from road noise across various elevations.

Daytime Noise Levels

Figure 11, Figure 12 and Figure 13 outline the predicted road traffic noise levels across the proposed site for the daytime period at 1.5m, 4m and 6.5m heights respectively.



Figure 11: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 1.5m height for the future development.

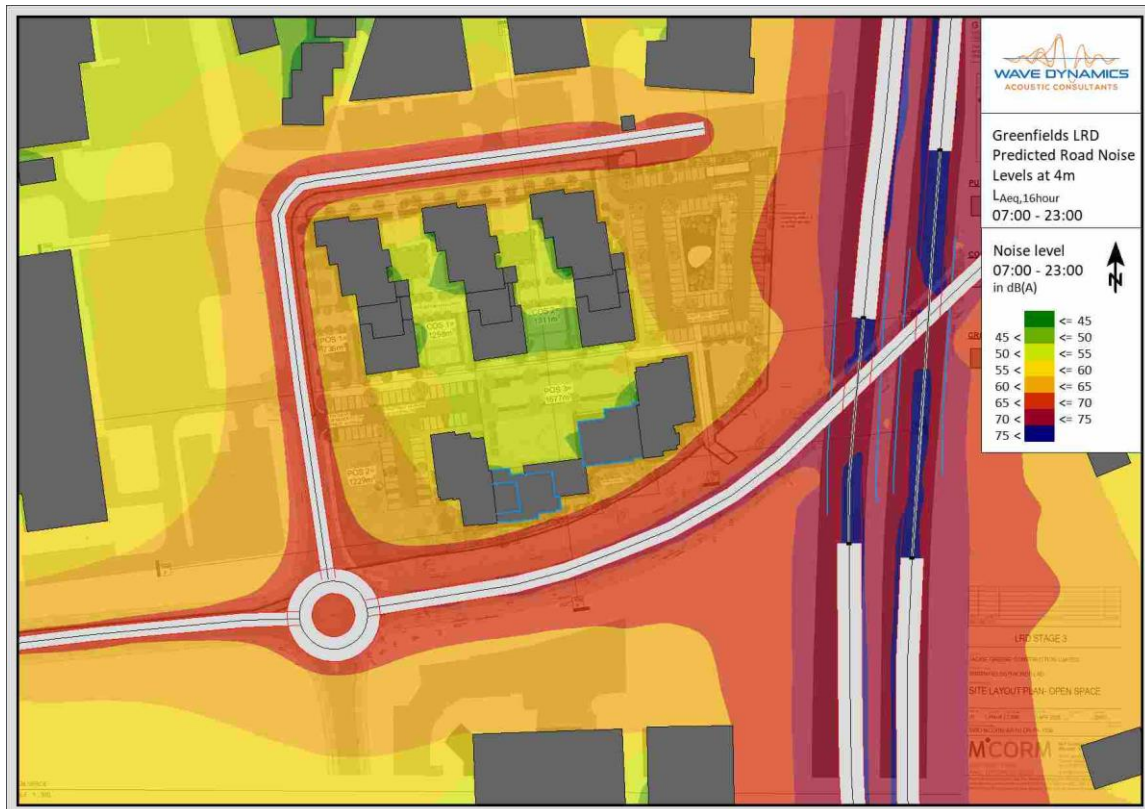


Figure 12: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 4m height for the future development.

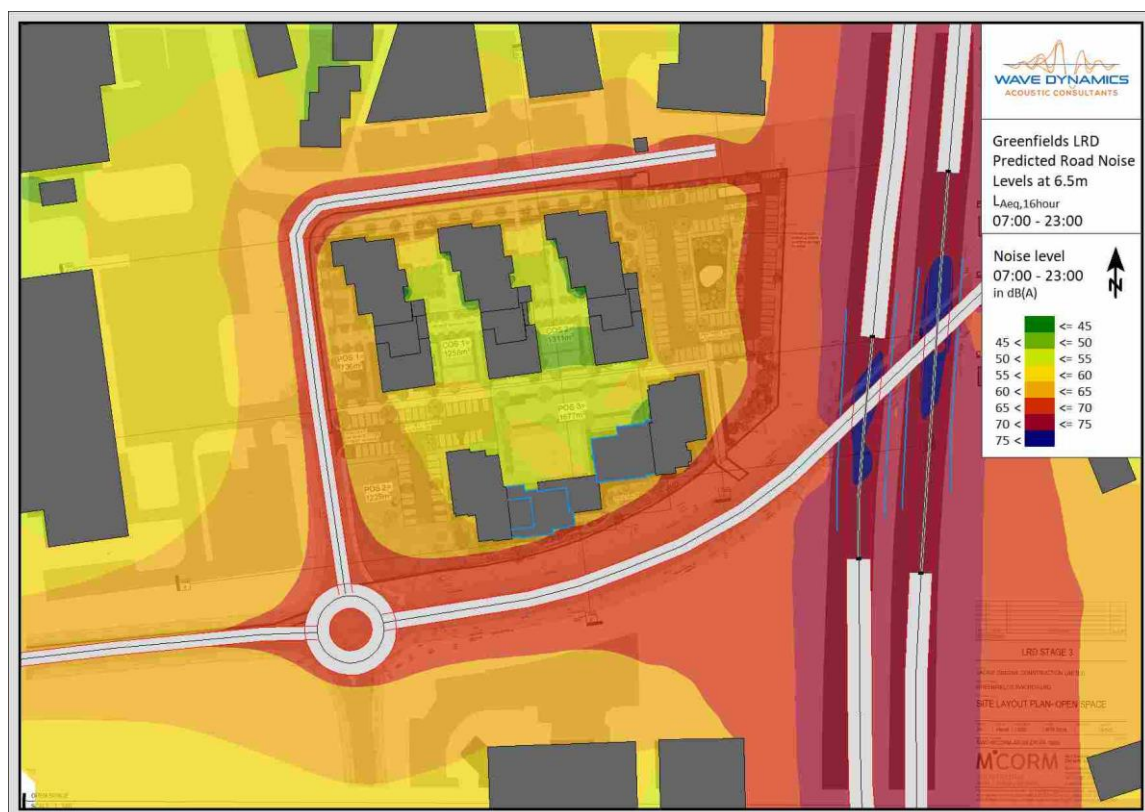


Figure 13: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 6.5m height for the future development.

Nighttime Noise Levels

Figure 14, Figure 15 and Figure 16 outline the predicted road traffic noise levels across the proposed site for the nighttime period at 1.5m, 4m and 6.5m heights respectively.

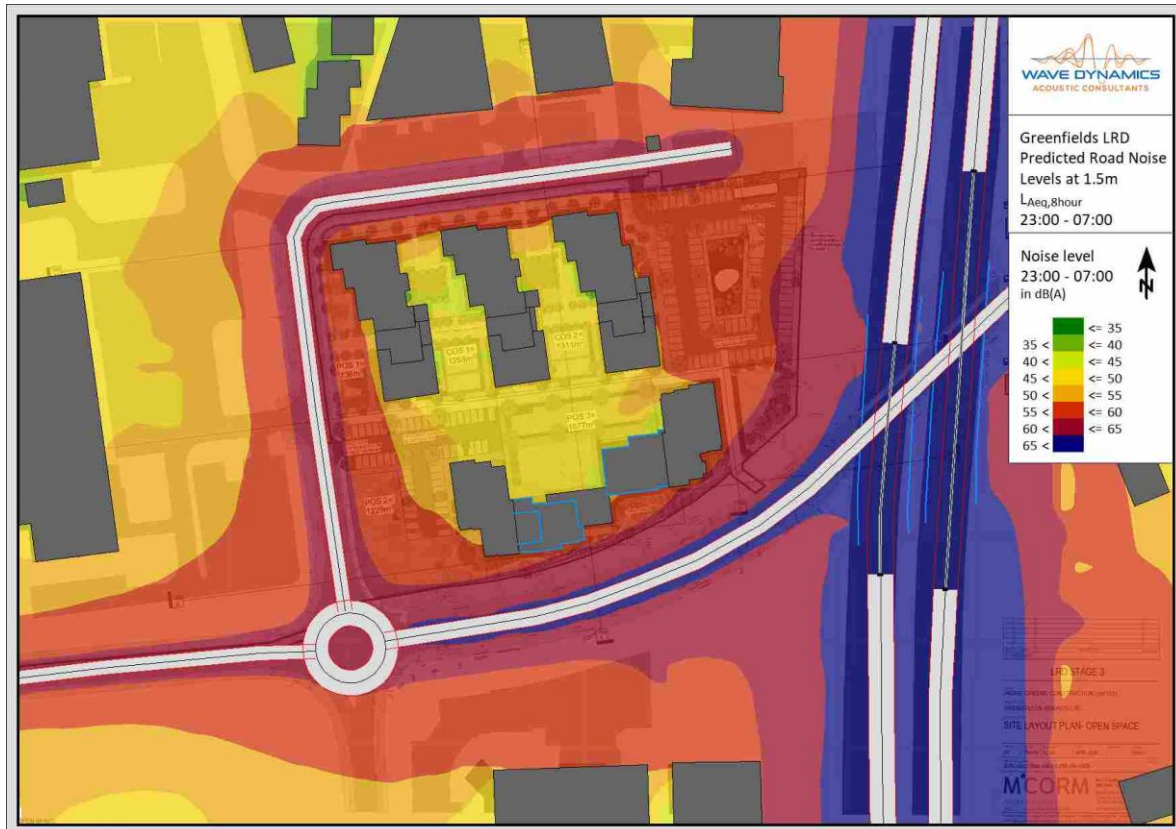


Figure 14: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 1.5m height for the future development.

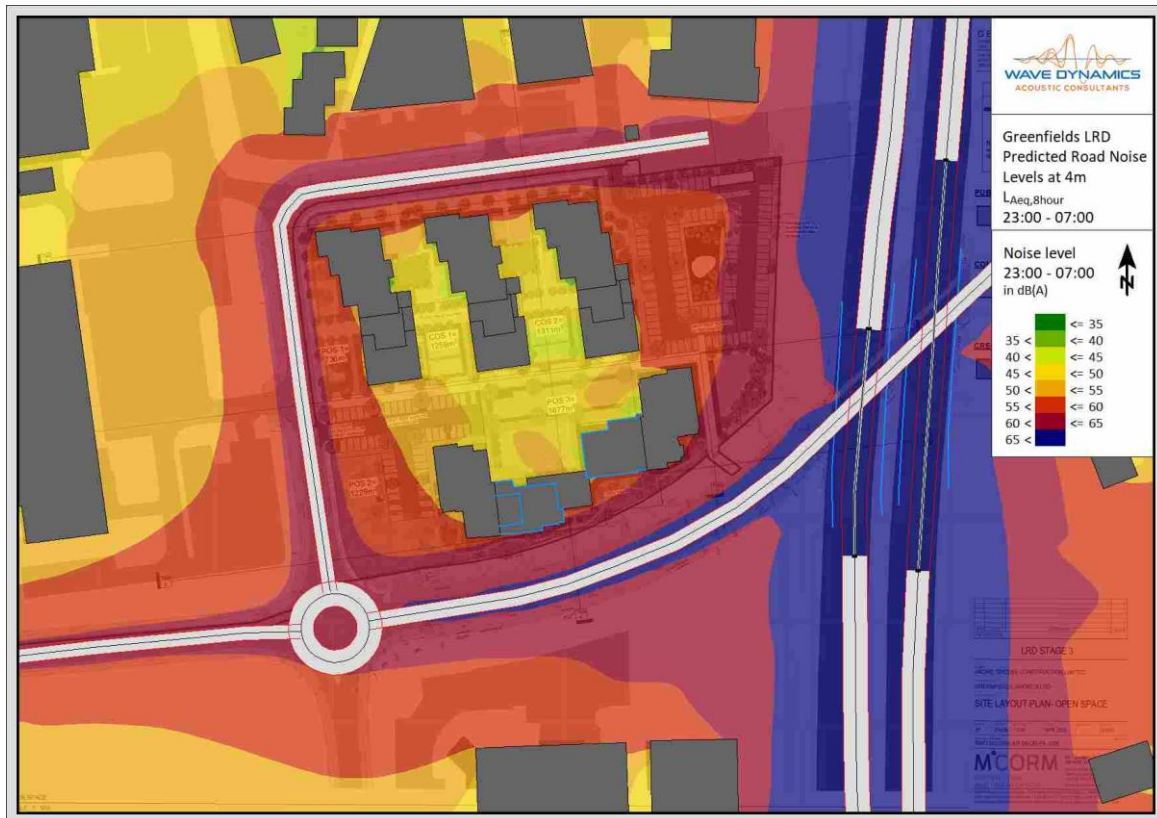


Figure 15: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 4m height for the future development.

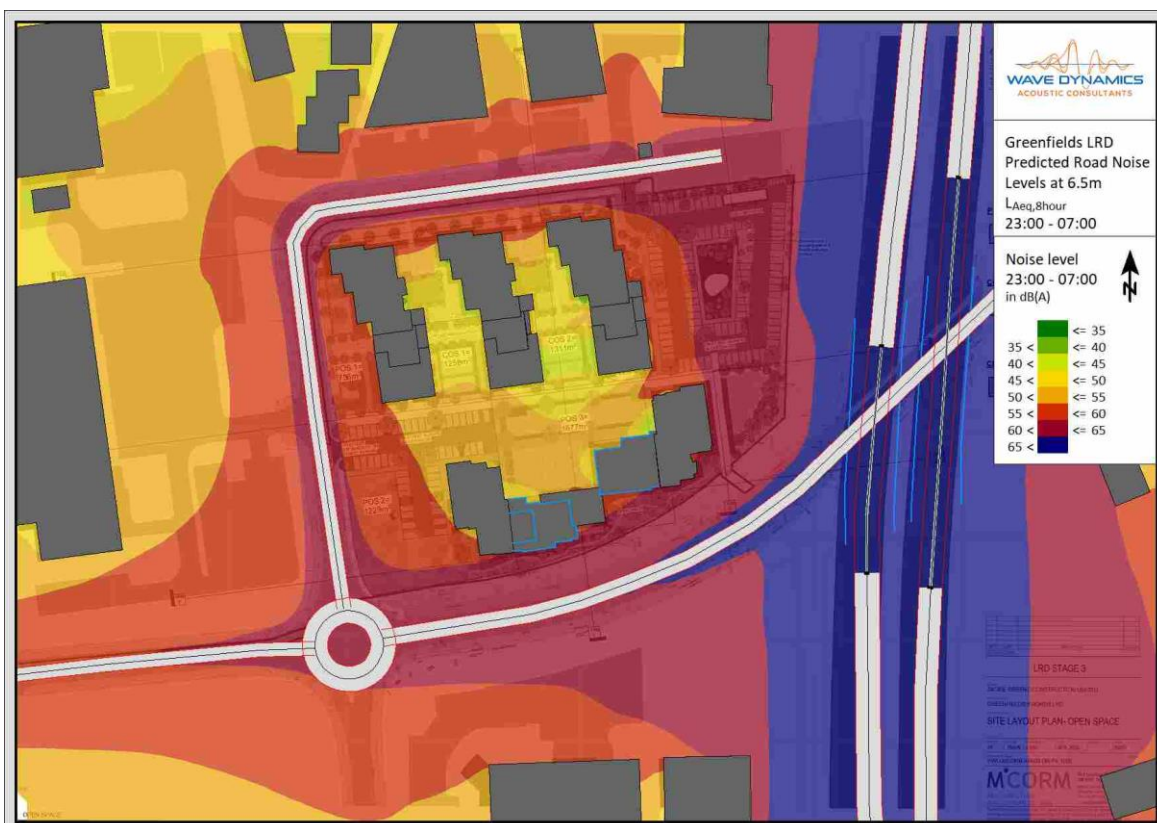


Figure 16: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 6.5m height for the future development.

Local Access Roads

It should be noted that the development has a local access road from the proposed entry road onto the site at Mantua Road, Swords Business Park. Break in noise through the façade has been considered as part of this assessment for vehicles entering and leaving the site via the local access road.

6.2.3 Building Envelope Specification

This section outlines the building envelope requirements based on the measurements outlined in Section 3. Facade, wall, glazing, roof and ventilation specifications have been determined to achieve the internal noise level criteria for the development. The specification has been determined in accordance with EN ISO 12354-3: 2017 based on the predicted façade day and night noise levels, the room and facade dimensions from the drawings provided.

The building envelope specification should be confirmed by the acoustic consultant at design stage once the internal layouts and building envelope design development has been completed. Any changes to the assumed ventilation strategy and glazing requirement should be considered as part of the review and it should be based on the internal noise levels cited in this report.

Glazed Elements and Ventilation

The glazed elements and ventilation openings are typically the acoustically weakest elements of any façade. The required sound insulation performance of façade glazed elements and ventilation openings is outlined in Table 8.

It is required that the glazing, frame and seals as a whole achieve the performance when the window is in the closed position. The performance requirements outlined in Table 8 are considered to provide adequate sound insulation to achieve the relevant day and night internal design goals respectively.

Where wintergardens are installed, glazing which separates the apartment from the wintergarden must meet the specifications outlined in Appendix B. Higher specification glazing of 40 dB R_w is specified for the apartments with wintergardens as they are on the perimeter of the site which has the highest noise levels. This is to ensure that when the wintergarden doors are in the open position, internal noise levels within the apartment still meet criteria outlined in Table 1.

Table 8: Sound Insulation performance requirements for glazed elements and ventilation.

Façade	Glazed Elements (Frame & Glazing) Sound Insulation Requirements (Indicative requirements equal or approved)							Façade Ventilation Requirement ²
	Octave Band Frequency Requirements ¹ Rw dB						Glazing Acoustic Performance dB Rw	
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
RED	29	29	36	42	54	67	40 dB Rw	Mechanical Ventilation
GREEN	21	23	26	29	41	29	34 dB Rw	Mechanical Ventilation

(1) Mechanical ventilation assumed throughout. Should this change to natural ventilation the above specification may be increased. An acoustic consultant should be engaged to assess the level of reduction appropriate to maintain the internal noise level criteria.

It is important to note that the requirements outlined above are minimum requirements for the glazed element as a whole. The octave band values are indicative and specific to the assessed glazing type, equal or approved to meet the minimum project requirements is acceptable.

We have assumed the ventilation strategy proposed is a mechanical ventilation system. Should the ventilation strategy change to a natural ventilation system, an Acoustic Consultant should be engaged to provide appropriate natural ventilation sound insulation performance requirements for any ventilation systems. Typically, the use of a mechanical ventilation strategy will lead to a reduced glazing specification compared to a naturally ventilation system. This assessment is based on the windows in closed position.

It is recommended that the facade supplier provide laboratory tests confirming the airborne sound insulation performance in the absence of suitable laboratory data a composite sound reduction index calculation undertaken by a suitably qualified acoustic consultant can be used to demonstrate compliance.

The calculations for the glazing specification in Table 8 are based on the use of mechanical ventilation.

External Wall Construction

The façade wall construction has been assumed to achieve a minimum sound insulation performance of 56dB R_w . Typical façade construction such as concrete, blockwork, timber frame and brick offer high levels of sound insulation and will meet this requirement.

Roof Construction

The roof construction has been assumed to achieve a minimum sound insulation performance of 50dB R_w . Any skylights and glazing in the roof system to corridor or communal areas should be of standard double-glazed construction to meet a performance of minimum 29 dB R_w . If there are any skylights to habitable bedrooms Wave Dynamics should be informed to provide specific guidance in each case.

6.3 Element 3- External Amenity Spaces

The external amenity spaces on the development include private balconies and wintergardens for the apartments, public open space at ground level and communal open spaces at ground and roof level. All external amenity spaces have been assessed in line with the ProPG desirable external noise levels and it can be concluded that the wintergardens across the site, Communal Open Space (COS) 1 and COS 2 at ground level, COS at Roof Level at Block D and E, Public Open Space 3, as well as all of the private balconies, terraces and the creche outdoor space will achieve the desirable external amenity noise levels of $\leq 55\text{dB } L_{Aeq,16\text{hour}}$ (07:00hrs – 23:00hrs) without mitigation as seen in Figure 17.

Wintergardens across the site will be in line with ProPG desirable external noise levels provided standard double glazing of a minimum **29 dB R_w** is installed to the wintergarden exterior facade.

The location of adequate external amenity spaces has been considered throughout the design development process. The site layout and addition of wintergardens on the perimeter of the site where noise levels are increased have provided adequate acoustic conditions within the site in accordance with ProPG guidance where acoustic conditions were previously unsuitable. The wintergardens will meet ProPG guidance for external amenity space of $\leq 55\text{dB } L_{Aeq,16\text{hour}}$ (07:00hrs – 23:00hrs) provided standard double glazing of a minimum rating of 29 dB R_w is used on the wintergarden's external façade. Glazing ratings for the apartment facades have been specified in 6.2.3 Building Envelope Specification.

The wintergardens on the northern elevation facing onto the Swords Business Park access road, the eastern elevation facing onto the M1 Motorway, the southern elevation facing onto Mantua Road and the western elevation facing onto the Swords Business Park access road are all predicted to meet the external amenity desirable noise levels.

Additional outdoor amenity spaces meeting ProPG recommendations are proposed on the development in the form of Public Open Space (POS) 3 at ground level and Communal Open Space (COS) 1 - 4 at ground and roof level as seen in Figure 17. The Creche Open Space at Block A is also within the required ProPG criteria for open spaces of $< 55\text{ dB}$.

The external amenity spaces are in line with element 3(v) of ProPG which states:

"Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:"

"a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or

a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)”.

Figure 17 highlights the proposed external amenity spaces at ground floor and roof level.

External noise levels across the Communal Open Spaces 1-4, and Public Open Space 3, roof terraces, and private amenity areas are predicted to comply with ProPG recommendations, with winter gardens incorporated where façade levels exceed 55 dB $L_{Aeq,16hr}$ to ensure adequate external amenity provision.



Figure 17: Indicative contour map displaying public/communal external amenity spaces within ProPG criterion.

6.4 Element 4- Assessment of Other Relevant Issues

This section of the acoustic design report considered the other relevant issues. Element 4 considers other issues which may remain relevant to the assessment, these issues are as follows:

- 4(i) compliance with relevant national and local policy.
- 4(ii) magnitude and extent of compliance with ProPG.
- 4(iii) likely occupants of the development.
- 4(iv) acoustic design v unintended adverse consequences and;
- 4(v) acoustic design v wider planning objectives.

6.4.1 Compliance with Relevant National and Local Policy

There are no specific noise guidance or policy documents for residential developments. The Dublin Agglomeration Noise Action Plan refers to the ProPG as the relevant document for assessment of the noise impact on new residential developments as followed in this acoustic design statement.

6.4.2 Magnitude and Extent of Compliance with ProPG

This report demonstrates that all dwellings will meet the specified internal noise level requirements provided the guidance in this report is followed. External amenity spaces have been provided and are in line with the guidance set out in ProPG. Based on this, the development is compliant with the ProPG requirements.

6.4.3 Likely Occupants of The Development

Additional needs of the future occupants are not known at this stage however the needs of all potential occupants have been considered with the assessment of adequate internal noise levels and provision of adequate external amenity spaces to meet the needs of potential occupants.

6.4.4 Acoustic Design v Unintended Adverse Consequences

The design has considered the impact of adverse consequences, mitigation has been provided by specification of the sound insulation and ventilation requirements as well as the site orientation and building layout.

6.4.5 Acoustic Design v Wider Planning Objective

Where possible the wider planning objectives have been considered including the need for residential housing with good transport links. It is assumed that the wider planning objectives have been adhered to by following the ProPG guidance.

6.4.6 Provision of a Creche at Block A

A creche and open space serving the creche is proposed at Block A. Considerations of noise from the creche have been made for the impact of noise for adjoining residences. Based on the proposed façade construction a break in calculation has been undertaken with the windows in the closed position (mechanical ventilation) The internal noise levels are predicted to achieve the requirements with the proposed glazing specification.

6.5 Stage 2 Assessment Conclusion

The stage 2 assessment considers all four (4) elements, the principals of good acoustic design have been followed.

The element 2 assessment has considered the measures required to provide an adequate acoustic environment with appropriate noise levels for internal spaces. The sound insulation and ventilation requirements have been specified based on the predicted façade noise levels.

The element 3 assessment of external amenity spaces, the noise impact on the development and the external amenity spaces has been considered. The appropriate provision of external amenity space has been provided through the use of balconies, wintergardens and the ground level public open space and roof level communal space. Through developing an acoustic design strategy with an appropriate site orientation and provision of wintergardens at the outer perimeter as well as balconies in the inner zone, the development is in line with the ProPG guidance.

Other relevant issues have been considered including, local policy, unintended consequences and the wider planning objectives.

7 Conclusion

Wave Dynamics were engaged by Jackie Greene Construction Limited as the acoustic consultants to provide an Acoustic Design Statement including an Inward Noise Impact for the planning application of the proposed new mixed-use development at Greenfields Swords LRD, Swords Business Park, Greenfields, Co. Dublin

“The proposed development consists of a mixed-use development that constitutes a ‘Large-Scale Residential Development’ (LRD) at this site of 2.22 Ha principally located at Swords Business Park, Swords, Co. Dublin. The site is principally bound: to the north by an access road and ancillary car park to serve Swords Business Park; to the east by the M1 Motorway; to the south by Mantua Road; and to the west by an access road to serve Swords Business Park. The application site also extends to include parts of: the access road to the north and west for footpath, landscape and foul drainage connection works; Mantua Road to the west for foul drainage connection works; and the green strip to the south at Mantua Road for a pedestrian and cyclist connection.

Permission is sought for a mixed-use development with a gross floor area of 30,358 sq m and principally comprised in 5 No. blocks (A–E), with heights ranging from 1 No. to 9 No. storeys. The proposed block heights are as follows: Block A is 6 No. to 7 No. storeys; Block B is 6 No. to 7 No. storeys; Block C is 6 No. to 7 No. storeys; Block D is 6 No. to 9 No. storeys; and Block E is 1 No. to 9 No. storeys. The development consists of: 289 No. residential apartments (60 No. 1-bed, 200 No. 2-bed and 29 No. 3-bed); retail/commercial unit (701 sq m); and crèche (418 sq m) with outdoor play area (42 sq m).

Permission is also sought for: new multi-modal site entrance to the west; minor relocation of existing northern site entrance to the east; internal road, cycle and footpath network; 132 No. car parking spaces; 13 no. motorcycle parking spaces; cycle parking; hard and soft landscaping, including public open space, communal amenity space (at-grade and as roof gardens atop Block D and Block E) and incidental open space; private amenity space as balconies and terraces facing all directions; public lighting; bin stores; plant rooms; 2 No. sub-stations; green roofs; rooftop plant, PV panels, telecommunications infrastructure, lift overruns and automatic opening vents; and all associated works above and below ground.”

Inward Noise Impact Assessment

As part of the assessment to categorise the site, a baseline noise survey was undertaken to measure the existing noise levels. The development is bounded by the M1 motorway which dominates the noise levels in the area with Mantua Road contributing to the noise levels. Attended and unattended noise measurements were conducted across the site to establish the existing noise climate in the area.

Following the baseline noise survey a noise model of the existing road noise was produced and calibrated with the site measurements. A review of the noise levels on the site was conducted, this included the L_{AFmax} and L_{Aeq} , the site has subsequently been characterised as medium to high risk across the entirety of the site.

Consideration has also been given to the fact that the site lies approximately 4km from the edge of the Dublin Airport. Indicative local measurement results have been included as have assessments of EPA airport noise maps to determine the impact from aircraft on the site. It can be seen that the dominant noise source is road traffic noise. The noise measurements were undertaken during peak road traffic times.

Break-in noise calculations to predict the internal noise levels from road traffic were conducted as part of the assessment. Consideration has also been given to the future growth of the roads. Following the assessment, the building envelope performance requirements were determined to achieve adequate internal noise levels. The performance specification for the building envelope has been provided in this report which includes the external walls, glazing of apartments and wintergardens, roof and ventilation requirements.

External Amenity Noise Levels

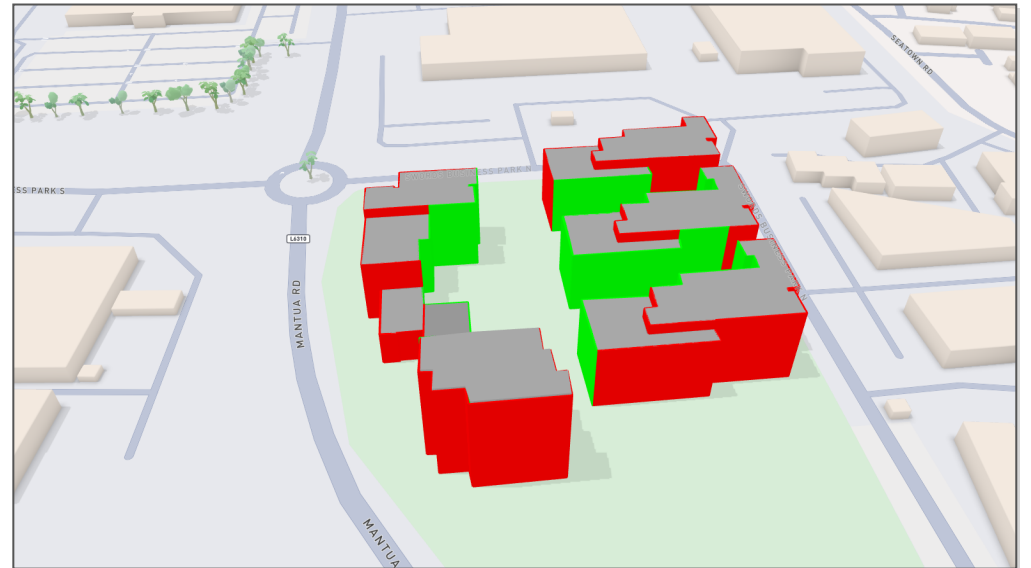
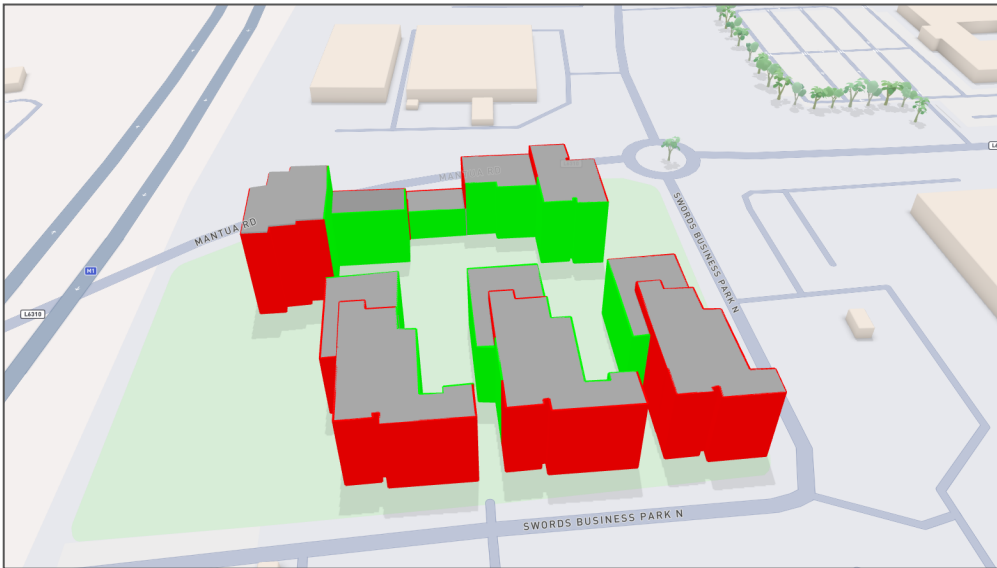
The external amenity spaces on the development include balconies and wintergardens for the apartments and Communal Open Spaces at ground and roof level and Public Open Spaces at ground level. Amenity has been provided in line with ProPG guidance on the development for residents using a combination of balconies on suitable facades, wintergardens and open communal amenity spaces at ground floor level. The creche open space at Block A is in line with ProPG guidance for the external amenity spaces. Communal Open Space 1-4, Public Open Space 3 as well as the wintergardens and balconies across the site are in line with element 3(v) of ProPG. Guidance set out in ProPG has been followed through an acoustic design strategy which considered the site layout and orientation as well as inclusion of wintergardens to provide adequate external amenity space.

Based on the recommendations in this report it is predicted that the internal and external noise levels will achieve the targeted noise levels in line with BS 8233:2014 and ProPG 2017 guidance.

Appendix A- Glossary of Terms

Ambient Noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from all the noise sources in the area.
Background Noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μ Pa).
dB(A)	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'-weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Hertz	The unit of sound frequency in cycles per second.
L_{A90}	A-weighted, sound level just exceeded for 90% of the measurement period and calculated by statistical analysis. See also the background noise level.
L_{Aeq}	A-weighted, equivalent continuous sound level.
L_{AFmax}	A-weighted, maximum, sound level measured with a fast time-constant - maximum is not peak
L_{den}	day-evening-night noise level, the A-weighted, L_{eq} (equivalent noise level) over a whole day, but with a penalty of 10 dB(A) for night-time noise (23:00-07:00) and 5 dB(A) for evening noise (19:00-23:00), also known as the day evening night noise indicator

Appendix B- Façade Mark Ups



Glazed Element Specification

- 40 dB Rw
- 34 dB Rw



Project: WDA250225 - Swords LRD

Title: Glazing Markup

Author: Joe Potter

Reviewer: James Cousins

Date: 2026-06-05

Appendix C- L_{day} , L_{eve} and L_{night} Noise Contours at 1.5m – 35m

Greenfields LRD
Predicted Road Noise
Levels at 1.5m
 $L_{Aeq,12hour}$
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



	≤ 45
	$45 < \leq 50$
	$50 < \leq 55$
	$55 < \leq 60$
	$60 < \leq 65$
	$65 < \leq 70$
	$70 < \leq 75$
	$75 <$

LRD STAGE 3

JACOB WIGWAG CONSTRUCTION LIMITED

GREENFIELDS PARKWAY LRD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 11/04/2024

BY: M. CORRIE

FOR: M. CORRIE

PROJECT: GREENFIELDS PARKWAY LRD

SCALE: 1:1000

DATE: 11/04/2024

BY: M. CORRIE

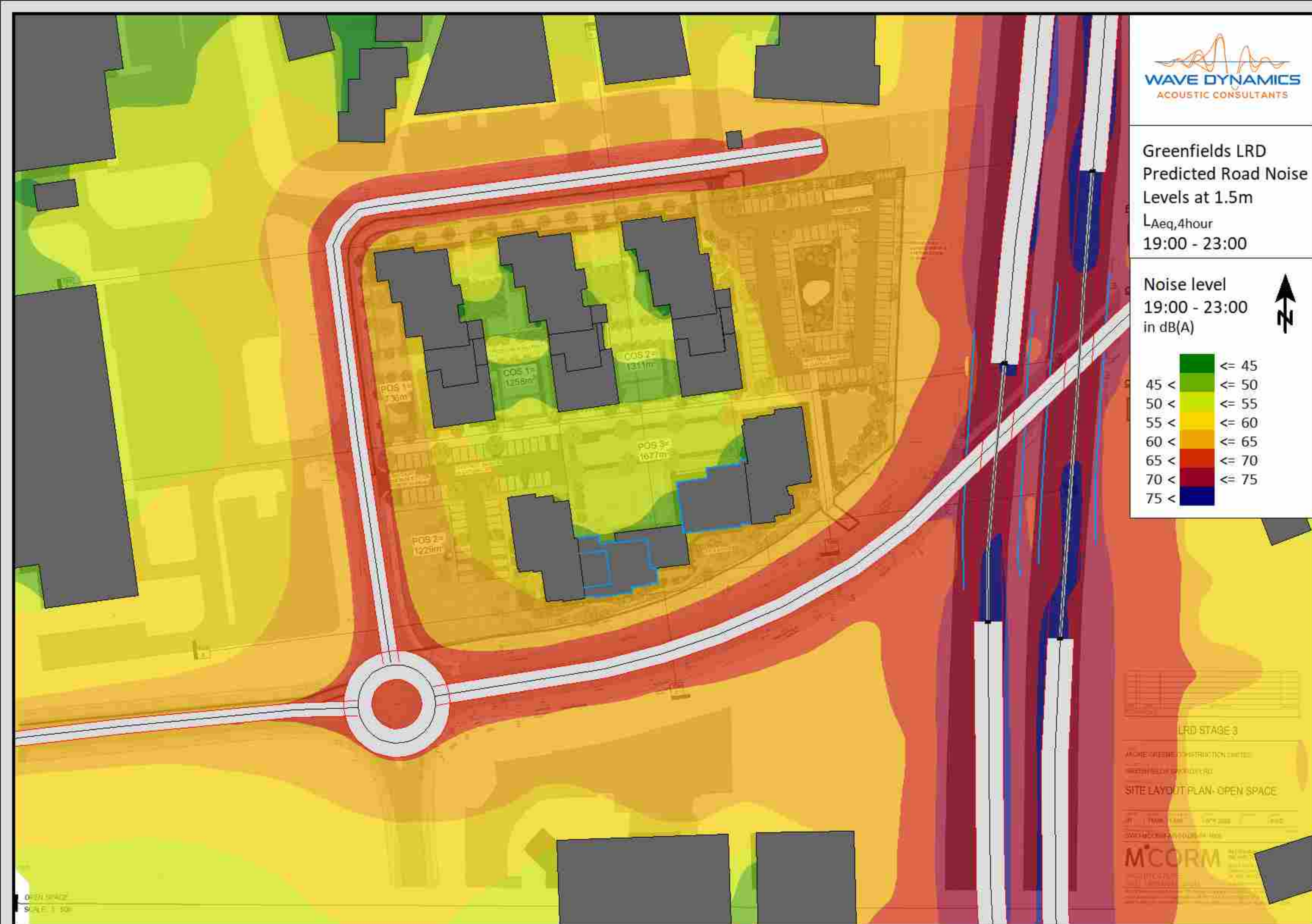
M'CORM

**Greenfields LRD
Predicted Road Noise
Levels at 1.5m**
L_{Aeq,4hour}
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



	≤ 45
45 <	≤ 50
50 <	≤ 55
55 <	≤ 60
60 <	≤ 65
65 <	≤ 70
70 <	≤ 75
75 <	



LRD STAGE 3
ARCHITECTURAL CONSTRUCTION LIMITED
GREENFIELD SPURWAY LRD
SITE LAYOUT PLAN - OPEN SPACE

DATE: 11/01/2018
SCALE: 1:500
M'CORMACK & CO. LTD.
M'CORMACK
ARCHITECTS
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Greenfields LRD Predicted Road Noise Levels at 1.5m

L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	

LRD STAGE 3

WAVE DYNAMICS LIMITED

GREENFIELDS LRD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 11/11/2011

WWW.MCORMACKGROUP.CO.UK

MCORMACK GROUP

11/11/2011

11/11/2011

Greenfields LRD Predicted Road Noise Levels at 4m

L_{Aeq,4hour}
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	



LRD STAGE 3

LARGE SCALE CONSTRUCTION LIMITED

GREENFIELDS MICRO-LOD

SITE LAYOUT PLAN - OPEN SPACE

DATE: 11/10/2017

BY: M. CORMAN

M'CORMAN

10/10/2017

10/10/2017

10/10/2017

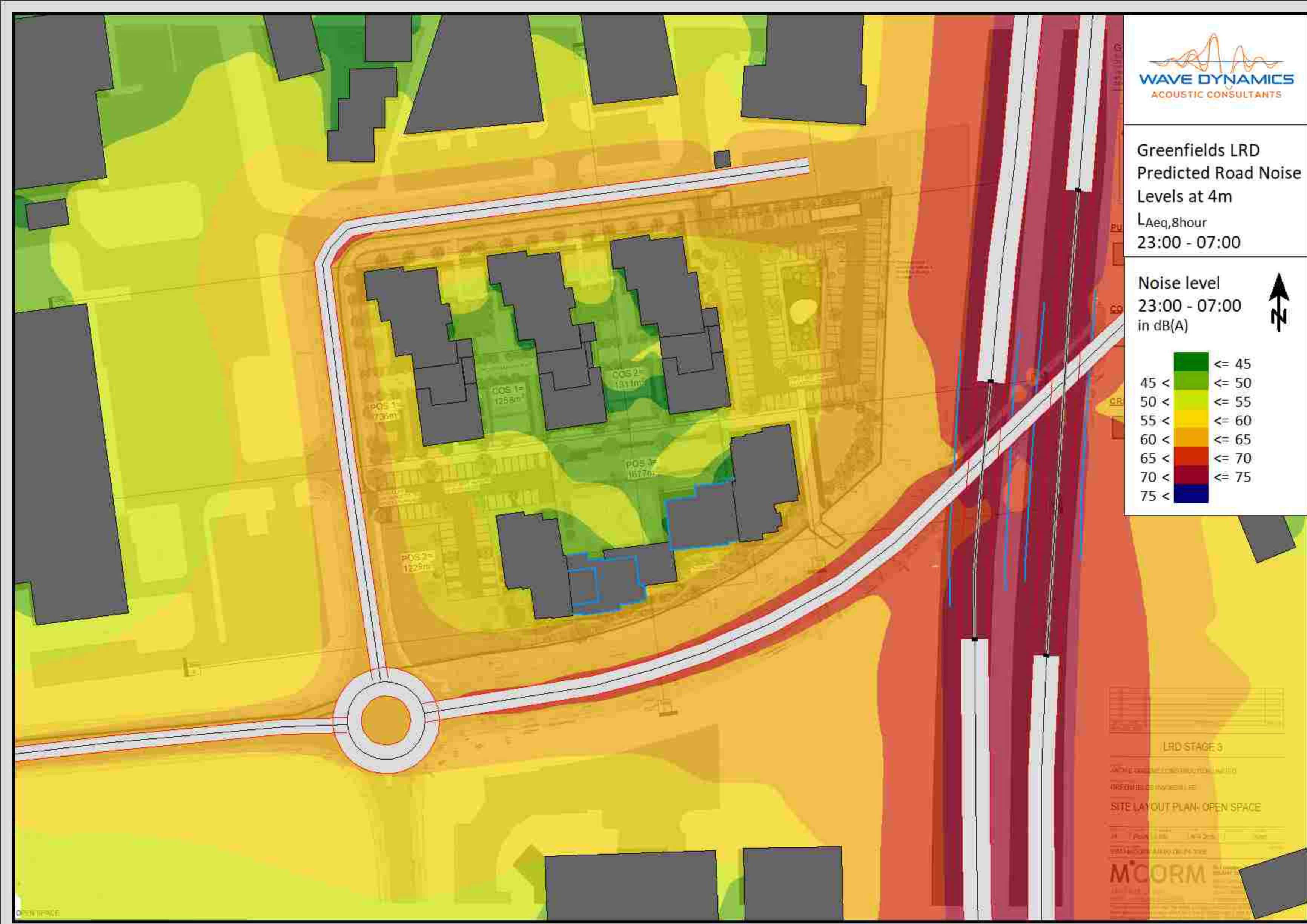
Greenfields LRD Predicted Road Noise Levels at 4m

L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	



LRD STAGE 3

JACOBE GREENFIELD CONSTRUCTION LIMITED

GREENFIELD ROADWAY LRD

SITE LAYOUT PLAN - OPEN SPACE

14 17/04/2024 1:00 PM 1:00 PM 1:00 PM

14 17/04/2024 1:00 PM 1:00 PM 1:00 PM

M'CORM

14 17/04/2024 1:00 PM 1:00 PM 1:00 PM

14 17/04/2024 1:00 PM 1:00 PM 1:00 PM

Greenfields LRD Predicted Road Noise Levels at 6m

L_{Aeq,4hour}
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



	≤ 45
45 <	≤ 50
50 <	≤ 55
55 <	≤ 60
60 <	≤ 65
65 <	≤ 70
70 <	≤ 75
75 <	

LRD STAGE 3

Acoustic and Noise Consultants Limited

01509 880000

SITE LAYOUT PLAN: OPEN SPACE

11/11/2011 11:11:11

11/11/2011 11:11:11

M'CORM

11/11/2011 11:11:11

11/11/2011 11:11:11

11/11/2011 11:11:11

11/11/2011 11:11:11

Greenfields LRD Predicted Road Noise Levels at 6m

L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



	≤ 45
45 <	≤ 50
50 <	≤ 55
55 <	≤ 60
60 <	≤ 65
65 <	≤ 70
70 <	≤ 75
75 <	



LRD STAGE 3

JACKIE GREEN CONSTRUCTION LIMITED

GREENFIELDS WOODS LRD

SITE LAYOUT PLAN: OPEN SPACE

DATE: 11/04/2018

BY: M'CORMACK & CO. LTD

M'CORMACK & CO. LTD

100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200

Greenfields LRD Predicted Road Noise Levels at 10m

$L_{Aeq,4hour}$
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



	≤ 45
	$45 < \leq 50$
	$50 < \leq 55$
	$55 < \leq 60$
	$60 < \leq 65$
	$65 < \leq 70$
	$70 < \leq 75$
	$75 <$

LRD STAGE 3

ANDRE-OWENS CONSTRUCTION LIMITED

GREENFIELD WOODS LRD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 15/05/2018

BY: M'CORM

M'CORM

Greenfields LRD Predicted Road Noise Levels at 15m

L_{Aeq,12hour}
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	

LRD STAGE 3

MOORE GREENE CONSTRUCTION (LIMITED)

OPENING DATE: 19/01/2019

SITE LAYOUT PLAN- OPEN SPACE

ALL RIGHTS RESERVED

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

WAVE DYNAMICS ACOUSTIC CONSULTANTS

Greenfields LRD Predicted Road Noise Levels at 15m

L_{Aeq,4hour}
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



<= 45	
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	



LRD STAGE 3

ORANGE FREEWAY CONSTRUCTION LIMITED

CONSTRUCTION OF ROAD

SITE LAYOUT PLAN - OPEN SPACE

DATE: 11/06/2020 SCALE: 1:1000

PROJECT NO: 1000000000000000

M'CORM

**Greenfields LRD
Predicted Road Noise
Levels at 15m**
L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



	≤ 45
45 <	≤ 50
50 <	≤ 55
55 <	≤ 60
60 <	≤ 65
65 <	≤ 70
70 <	≤ 75
75 <	



LRD STAGE 3

JACKIE GREEN CONSULTATION LIMITED

ENVIRONMENTAL SERVICES LTD

SITE LAYOUT PLAN: OPEN SPACE

DATE: 10/01/2018

WAVE DYNAMICS CONSULTANTS

M'CORM

Greenfields LRD Predicted Road Noise Levels at 20m

$L_{Aeq,12hour}$
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



≤ 45	≤ 45
$45 < \leq 50$	≤ 50
$50 < \leq 55$	≤ 55
$55 < \leq 60$	≤ 60
$60 < \leq 65$	≤ 65
$65 < \leq 70$	≤ 70
$70 < \leq 75$	≤ 75
$75 < \leq 80$	≤ 80

LRD STAGE 3

JACOBSON CONSTRUCTION LIMITED

GREENFIELDS DEVELOPMENT

SITE LAYOUT PLAN - OPEN SPACE

DATE: 10/10/2017

BY: M. CORMAN

FOR: JACOBSON CONSTRUCTION LIMITED

PROJECT: GREENFIELDS DEVELOPMENT

SCALE: 1:1000

DATE: 10/10/2017

BY: M. CORMAN

FOR: JACOBSON CONSTRUCTION LIMITED

PH 552Z
CALL 7-5500

Greenfields LRD Predicted Road Noise Levels at 20m

$L_{Aeq,8hour}$
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



≤ 45	≤ 45
$45 < \leq 50$	≤ 50
$50 < \leq 55$	≤ 55
$55 < \leq 60$	≤ 60
$60 < \leq 65$	≤ 65
$65 < \leq 70$	≤ 70
$70 < \leq 75$	≤ 75
$75 < \leq 80$	≤ 80

LRD STAGE 3

JACOBS ENGINEERING CONSULTANTS LIMITED

GREENFIELDS LRD STAGE 3

SITE LAYOUT PLAN - OPEN SPACE

DATE: 15/04/2016

SCALE: 1:1000

M'CORM

15/04/2016

15/04/2016

15/04/2016

15/04/2016

Greenfields LRD Predicted Road Noise Levels at 25m

L_{Aeq,12hour}
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



	≤ 45
45 <	≤ 50
50 <	≤ 55
55 <	≤ 60
60 <	≤ 65
65 <	≤ 70
70 <	≤ 75
75 <	

LRD STAGE 3

JACQUE GREENE CONSTRUCTION LIMITED

GREENFIELDS DEVELOPMENT LTD

SITE LAYOUT PLAN- OPEN SPACE

11 15000 1:1000 11/10/2011

SATURN SOFTWARE

M'CORM

11/10/2011

11/10/2011

11/10/2011

11/10/2011

11/10/2011

Greenfields LRD Predicted Road Noise Levels at 25m

L_{Aeq,4hour}
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

LRD STAGE 3

MCMC GREEN CONSTRUCTION LIMITED

GREENFIELDS MOTOR LTD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 12/12/2018 DRAWN: J. SMITH

SCALE: 1:1000

M'CORM

10/10/2018

10/10/2018

10/10/2018

Greenfields LRD Predicted Road Noise Levels at 25m

L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	

LRD STAGE 3

JACKIE DODDIE CONSTRUCTION LIMITED

GREENFIELDS LRD

SITE LAYOUT PLAN - OPEN SPACE

DATE: 11/11/2020 1:40 PM

WAVE DYNAMICS ACOUSTIC CONSULTANTS

M'CORM

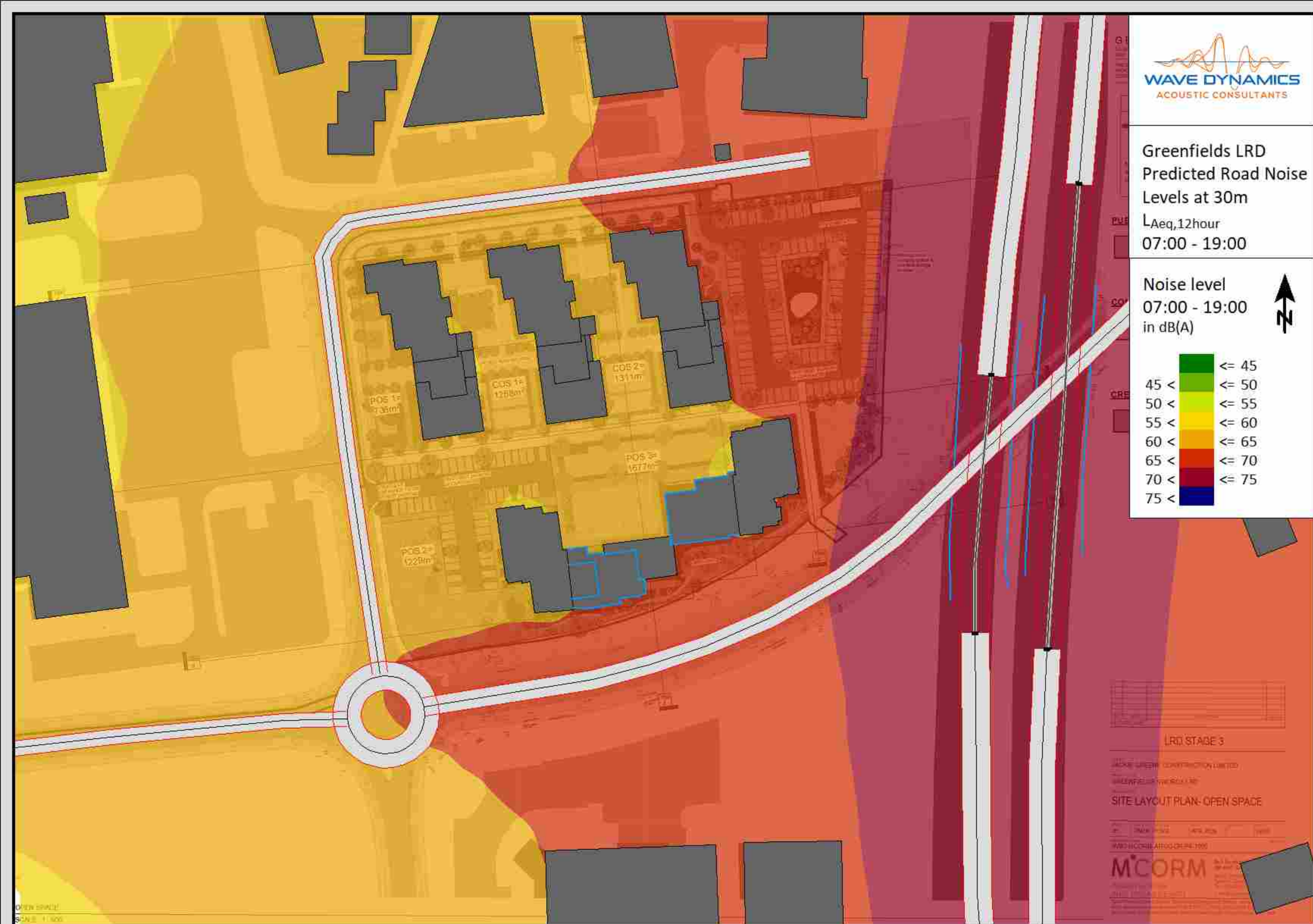
Greenfields LRD Predicted Road Noise Levels at 30m

L_{Aeq,12hour}
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	



LRD STAGE 3

JACKIE GREEN CONSTRUCTION LIMITED

GREENFIELD LRD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 10/05/2022

WAVE DYNAMICS

MCCORM

10/05/2022

10/05/2022

10/05/2022

10/05/2022

Greenfields LRD Predicted Road Noise Levels at 30m

$L_{Aeq,8hour}$
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



	≤ 45
	$45 < \leq 50$
	$50 < \leq 55$
	$55 < \leq 60$
	$60 < \leq 65$
	$65 < \leq 70$
	$70 < \leq 75$
	$75 <$

LRD STAGE 3

JACOBI O'BRIEN CONSTRUCTION LIMITED

GREENFIELDSDOWN LRD

SITE LAYOUT PLAN - OPEN SPACE

DATE: 11/01/2017

BY: M. CORN

M. CORN

11/01/2017

11/01/2017

11/01/2017

11/01/2017

Greenfields LRD Predicted Road Noise Levels at 35m

L_{Aeq,12hour}
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



<= 45	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	

LRD STAGE 3

JACOB GREENE CONSTRUCTION LIMITED

GREENFIELD DEVELOPMENT

SITE LAYOUT PLAN - OPEN SPACE

DATE: 15/01/2024

SCALE: 1:500

PROJECT: 2024/01/01

CLIENT: JACOB GREENE CONSTRUCTION LIMITED

PROJECT: 2024/01/01

SCALE: 1:500

DATE: 15/01/2024

PROJECT: 2024/01/01

M'CORM

PROJECT: 2024/01/01

SCALE: 1:500

DATE: 15/01/2024

PROJECT: 2024/01/01

Greenfields LRD
Predicted Road Noise
Levels at 35m
LAeq,4hour
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



		<= 45
45 <		<= 50
50 <		<= 55
55 <		<= 60
60 <		<= 65
65 <		<= 70
70 <		<= 75
75 <		



LRD STAGE 3

WORK (OPEN) CONSTRUCTION LIMITED
TRAFFIC SPEED 50km/h

SITE LAYOUT PLAN- OPEN SPACE

DATE: 10/10/2018

BY: [Signature]

FOR: [Signature]

PROJECT: [Signature]

SCALE: 1:1000

DATE: 10/10/2018

M'CORM

ACOUSTIC CONSULTANTS

10/10/2018

10/10/2018

Greenfields LRD Predicted Road Noise Levels at 35m

$L_{Aeq,8hour}$
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



≤ 45	≤ 45
$45 <$	≤ 50
$50 <$	≤ 55
$55 <$	≤ 60
$60 <$	≤ 65
$65 <$	≤ 70
$70 <$	≤ 75
$75 <$	

LRD STAGE 3

JACOB GREEN CONSTRUCTION LIMITED

GREENFIELDS MARCHES LTD

SITE LAYOUT PLAN- OPEN SPACE

DATE: 14/01/2016

BY: [Signature]

M'CORM

ACOUSTIC CONSULTANTS

14/01/2016

14/01/2016

14/01/2016

Appendix D- 3D Model Façade Noise Map

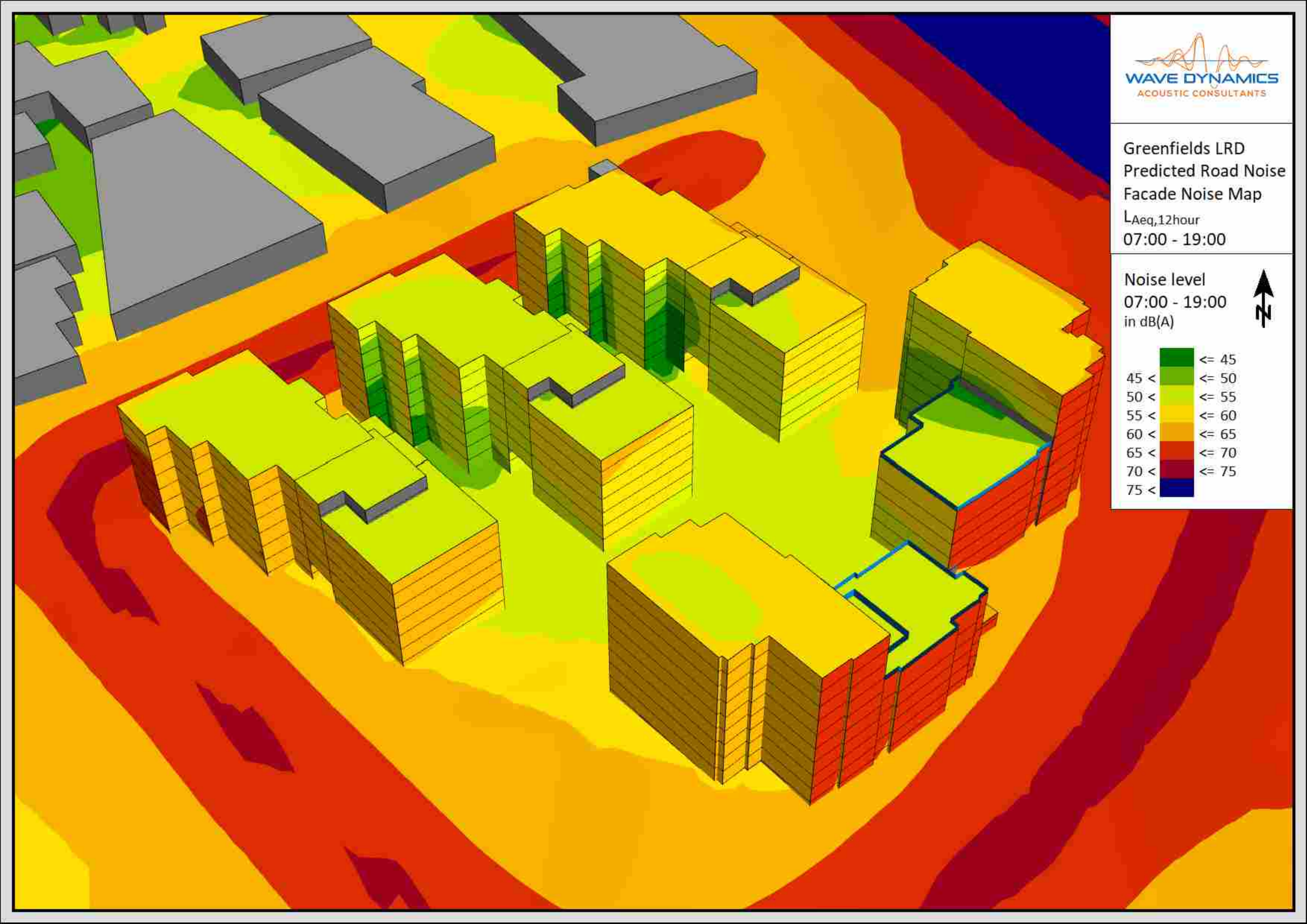
Greenfields LRD
Predicted Road Noise
Facade Noise Map

$L_{Aeq,12hour}$
07:00 - 19:00

Noise level
07:00 - 19:00
in dB(A)



		≤ 45
45 <		≤ 50
50 <		≤ 55
55 <		≤ 60
60 <		≤ 65
65 <		≤ 70
70 <		≤ 75
75 <		



Greenfields LRD
Predicted Road Noise
Facade Noise Map

$L_{Aeq,4hour}$
19:00 - 23:00

Noise level
19:00 - 23:00
in dB(A)



		≤ 45
45 <		≤ 50
50 <		≤ 55
55 <		≤ 60
60 <		≤ 65
65 <		≤ 70
70 <		≤ 75
75 <		

Greenfields LRD
Predicted Road Noise
Facade Noise Map

L_{Aeq,8hour}
23:00 - 07:00

Noise level
23:00 - 07:00
in dB(A)



		≤ 45
45 <		≤ 50
50 <		≤ 55
55 <		≤ 60
60 <		≤ 65
65 <		≤ 70
70 <		≤ 75
75 <		