Amplitude Acoustics

Muldowneys Rathcoole

Acoustic Design Statement

D210105RP1 R1

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Amplitude Acoustics

Document Information

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Revision Table

Report revision	Date	Description	Author	Reviewer
Draft	07/12/2021	For comment	Benny Cryan	Dominic Parkinson
R0	11/01/2022	For issue	Benny Cryan	Dominic Parkinson
R1	24/01/2022	Revised drawings	Benny Cryan	Dominic Parkinson

Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of that sound level.
dB(A)	Units of the A-weighted sound level.
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.
L_{eq}	Equivalent Noise Level—Energy averaged noise level over the measurement time.
L_{90}	Noise level exceeded for 90 % of the measurement time. The L_{90} level is commonly referred to as the background noise level.
R_W	Weighted Sound Reduction Index—A laboratory measured value of the acoustic separation provided by a single building element (such as a partition). The higher the R_W the better the noise isolation provided by a building element.
Reverberation Time (RT)	Of a room, for a sound of a given frequency or frequency band, the time that would be required for the reverberantly decaying sound pressure level in the room to decrease by 60 decibels.
$D_{n,e,w}$	Element normalised level difference, weighted - A laboratory measured value of the acoustic separation provided by a small building element.
L_{den}	(day-evening-night noise level) is the A-weighted, Leq (equivalent noise level) over a whole day, but with a penalty of +10 dB(A) for night-time noise (22:00-07:00) and +5 dB(A) for evening noise (19:00-23:00).
L_{day}	(day noise level), is the A-weighted. Leq (equivalent noise level) over the 16-hour day period of 07:00-23:00 hours. also known as the day noise indicator
L_{night}	(night noise level), is the A-weighted. Leq (equivalent noise level) over the 8-hour night period of 23:00-07:00 hours. also known as the night noise indicator.

Executive Summary

Amplitude Acoustics have been engaged to conduct an acoustic assessment for the planning application for the new residential development at the rear of the existing Muldowney's Pub, Rathcoole. The proposed development includes the construction of 21 new build apartments, the refurbishment of an existing house into 2 apartment units (total of 23 units) and associated tenant amenity spaces.

As the development site is located adjacent to the busy N7, an acoustic assessment of road traffic noise levels incident on the site has been undertaken. This report details the results of the assessment based on traffic noise levels measured at the site and predicted noise levels based on future traffic growth.

Assessment Criteria

The criteria for the project have been developed with regard to the requirements of *BS 8233:2014 Guidance on sound insulation and noise reduction for buildings* and *ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise New Residential Development May 2017*.

It should be noted that the recommended internal levels of BS8233 and ProPg 2017 are similar to those in the *WHO Guidelines for Community Noise 1999* and *WHO Night Noise Guidelines for Europe 2009*. Furthermore, these internal noise levels are also aligned with the objectives of *EU Noise Policy* implemented through the *EU Noise Directive* and associated *Dublin Agglomeration Environmental Noise Action Plan*.

The design advice provided for the building façade is suitable for achieving the recommended internal levels with the windows closed and appropriate acoustic ventilation systems installed. Open windows typically provide a reduction of approximately only 10dB - 15dB and should not be relied on for the ventilating strategy for the building, except for rapid or purge ventilation. It is generally accepted that a higher level of noise from outside the building is accepted by residents when they have a degree of control over the noise intrusion i.e., they can close the windows.

Noise emissions from the Public House have been predicted and considered in determining façade sound insulation requirements.

Covid 19 restrictions and the effects of the lower traffic volumes on the traffic noise during the attended surveys were taken into consideration.

Conclusion

The Interior noise levels for the whole development are predicted to comply with recommended interior sound levels detailed within BS 8233 and ProPg 2017, provided that the construction requirements detailed in Section 6 are implemented.

The central communal amenity space at ground level is predicted to comply with the recommended levels of ProPG. The Cottages amenity spaces will also naturally comply with the ProPG and BS8233 criteria for desirable external noise levels as they benefit greatly from the proposed layout of the buildings and the inclusion of perimeter walls.

Winter gardens have been recommended in place of balconies for private external amenity spaces located on certain facades of Blocks A and B.

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Disclaimer: The design guidance outlined in this document is specific to the acoustic design only. Additional advice should be sought for disciplines as appropriate including but not limited to Fire Engineering, Structural Engineering, Safety, Conservation and Construction amongst others.

1 Introduction

Amplitude Acoustics have been engaged to conduct an acoustic assessment for the planning application of a proposed new residential development at the rear of the existing Muldowney's Pub, Rathcoole. We understand the development includes the construction of 21 new build apartments, the refurbishment of an existing house into 2 apartment units (total of 23 units) and associated tenant amenity spaces.

As the development site is located adjacent to the busy N7, an acoustic assessment of road traffic noise levels incident on the site has been undertaken. This report details the acoustic assessment of the site including internal and external amenity noise levels based on traffic noise levels measured at the site and predicted noise levels based on future traffic growth.

Implementing the acoustic design guidance in this report is predicted to achieve acceptable internal noise levels for the proposed use of the site.

2 Site Description

The proposed development is located at the rear of the existing Muldowney's Pub, Main Street, Rathcoole, Co. Dublin. The site is bounded by:

- The N7 dual Carriageway to the North.
- Rathcoole Church & Scoil Chrónáin followed by Commercial and residential property to the west.
- Residential property to the East.
- Rathcoole Main Street to the South.

The Naas Road N7, adjacent to the site, is composed of a three-lane carriageway and 1 turning lane west bound and a further three-lane carriageway and slip road east bound with a central reservation 8m wide and a section speed limit of 100km/hr. Rathcoole Main Street on the south boundary of the site is composed of 1 east bound and 1 west bound lane with footpaths on both sides and a section speed limit of 50km/hr. Figure 1 below shows an aerial view of the proposed development site in relation to the surrounding area, Nass road N7 and Rathcoole Main Street. Also shown in Figure 1 are the three attended survey monitoring positions. The unattended noise monitor was deployed at position #1.

Figure 1: Aerial view showing the proposed development site in relation to the surrounding area, N7 and Rathcoole Main Street with monitoring positions also shown. Image © Google Earth

3 Acoustic Criteria

The criteria for the project have been developed with regard to the requirements of ProPG 2017, BS 8233:2014, WHO Guidelines, and the Dublin Agglomeration Noise Action Plan.

3.1 Internal Noise Levels

The relevant internal noise criteria for the development have been based on the requirements of BS 8233:2014 Guidance on sound insulation and noise reduction for buildings and *ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise New Residential Development May 2017* and Dublin Agglomeration Environmental Noise Action Plan December 2018 - July 2023. Table 1 below provides relevant internal L_{Aeq} target levels for overall noise in the design of a building:

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

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

Note 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 $L_{Amax,F}$ more than 10 times a night.

For the purposes of this assessment, we have determined façade requirements on the basis of achieving internal noise criteria as shown in Table 1 for the living, sleeping and working areas of the proposed development.

3.2 External Amenity Areas

Guidance on noise levels for external amenity areas is provided by BS 8233:2014, ProPG 2017 and Dublin Agglomeration Noise Action Plan December 2018-July 2023. 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 LAeq,16hr*". The standard continues… "*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.*"

The Dublin Agglomeration Noise Action Plan 2018 – 2023 defines desirable and undesirable noise levels as:

> *"In line with the previous noise action plan, the following are the target values for desirable low and undesirable high sound levels in the Noise Action Plan 2018-2023:*
>
> *Desirable Low Sound levels*
> *< 50 dB(A) Lnight*
> *< 55 dB(A) Lday*
>
> *Undesirable High Sound levels*
> *> 55 dB(A) Lnight*
> *> 70 dB(A) Lday"*

It should be noted that both BS8233:2014 and ProPG 2017 do not advise that development should be restricted in areas with undesirable noise levels, however it does recommend that appropriate mitigation measures are put in place

and planning should not be restricted on this basis. Where required, design guidance has been provided to ensure lowest practicable external noise levels are achieved in line with ProPG 2017.

4 Noise Measurements

4.1 Details

An environmental noise survey of the development site was undertaken between 6th and 11th August 2021. Both attended and unattended measurements were undertaken. Attended noise survey was undertaken on the site on 11th August 2021. An unattended noise monitor was deployed onsite from 15:00hrs on 6th August 2021 to 09:15hrs on 11th August 2021 to continuously record noise levels.

4.2 Instrumentation

A Class 1 sound level meter/noise logger in accordance with IEC 61672-1:2013 was used for all measurements. Table 2 below summarises the measurement equipment used.

Table 2: Measurement Equipment

Description	Manufacturer	Model	Serial no
Sound Level Meter	Sinus	Tango Plus	0001813
Acoustic Calibrator	Norsonic	Nor1251	35275

All equipment has calibration certificates traceable back to the relevant Standard. A calibration check of the sound level meter was conducted prior to and following the assessment using an external acoustic calibrator, with no significant drift in calibration measured.

4.3 Procedure

Noise measurements were undertaken in accordance with the following:

- Attended and unattended measurements were conducted at locations on site as shown in Figure 1.
- All measurement were completed in accordance with the guidance and procedures outlined in *ISO 1996-2:2017 Acoustics — Description, measurement and assessment of environmental noise — Part 2: Determination of sound pressure levels*.
- A wind shield was used during all measurements, and the measurements were undertaken during a calm, still period (for which the wind velocity did not exceed 5 m/s).
- Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration or electrical interference.

4.4 Weather Conditions During Survey

Weather conditions during the attended survey were as follows:

- Wind: strong southerly breeze (below 5m/s).
- Precipitation: Some light rain at times during survey which did not affect measurements and roads remained dry.
- Other: no additional weather effects noted.

Weather conditions during the unattended survey were as follows:

- Wind: Westerly to southerly winds during dry period of the survey.
- Precipitation: Rain recorded for periods during the unattended survey, these periods were excluded.
- Other: no additional weather effects noted.

4.5 Results

4.5.1 Attended Noise Survey Results

A summary of the attended measurements taken on 11th August 2021 to quantify the traffic noise levels across the site can be seen in Table 3. The measurements were taken at 2 locations on site and 1 location on Rathcoole Main Street (Location #3). Traffic noise from the N7 was observed to be the dominant noise source within the development site for the duration of the site visits. Other sources included birdsong, dogs barking and domestic/commercial alarms.

Table 3: Summary of attended noise measurements on 11th August 2021

Date	Time	Period	Location	Noise Levels
				$L_{Aeq, 15min}$ dB
11/08/2021	09:29	Day	#1	63[1]
11/08/2021	09:47	Day	#2	57[1]
11/08/2021	10:06	Day	#3	68

(1) Measurements taken under upwind conditions source to receiver.

4.5.2 Unattended Noise Monitoring Results

A summary of the relevant daytime measured levels at location #1 are presented in Table 5 below followed by the night-time measured levels in Table 4. Days which were affected by long periods of rainfall and weekend data are not shown in the table.

Table 4: Daytime Traffic noise measurements for 6th – 11th August 2021 at noise monitor location (#1).

Assessment period	Start Date	L_{Aeq} dB
07:00 to 23:00 Hrs	10/09/2021	64[2] dB(A) $L_{Aeq, 16\ hour}$

(2) Measurements taken under crosswind conditions source to receiver.

Table 5: Night-time Traffic noise measurements for 6th – 11th August 2021 at noise monitor location (#1).

Assessment period	Start Date	L_{Aeq} dB
23:00 to 07:00 Hrs	10/09/2021	59[2] dB(A) $L_{Aeq, 8\ hour}$
23:00 to 07:00 Hrs	10/09/2021	57[1] dB(A) $L_{Aeq, 8\ hour}$

The N7 road noise monitoring data obtained during periods without rain was affected by crosswind and upwind conditions and consequently a correction of +1.5dB has been applied to the site noise levels for calibration of the noise model. This ensures that predictions are sufficiently conservative in favour of future residents of the development.

5 Assessment

Noise emissions on the proposed site have been modelled using SoundPLAN 8.2 which implements the 'Calculation of road traffic noise (CORTN) algorithm'. The model accounts for the following factors:

- Traffic Flow in terms of Annual Average Daily Traffic (AADT).
- Percentage Heavy Vehicles.
- Traffic Speed and road gradient.
- Distance attenuation, including source and receptor heights.
- Barrier effects due to facility structures and other buildings.
- Ground effects and absorption.
- Atmospheric attenuation.

There was no traffic data available for Main Street. Traffic volumes were estimated based on the noise measurements and attended traffic count taken during the site visit. The model has been calibrated and validated using the results of both the unattended monitoring, and the spatially distributed attended calibration measurements shown in Figure 1. Good agreement between measured and predicted existing noise levels was found.

5.1 COVID-19 Traffic Impact

Available TII traffic data[1] indicates there was a 3% reduction in daytime traffic and an 18% reduction in night-time traffic at the time of the assessment compared to pre covid 19 traffic levels, therefore a correction factor has been applied to the noise model. The correction factor is small at +2.4% in daytime traffic and +22% in night-time traffic (equating to 0.1dB and 0.9dB respectively).

5.2 Existing Traffic Noise Contours

Using the SoundPLAN model, the existing traffic noise contours across the site have been illustrated. Figure 2 below shows the existing daytime noise levels, L_{day}, across the site. It is clear from the attended measurements and the noise model that traffic noise levels reduce towards the southern part of the site, closest to Muldowneys Pub. Figure 3 on the following page shows the existing night-time noise levels, L_{night}, across the site. Similarly, the night-time noise levels reduce with increasing distance from N7 traffic as expected.

[1] https://www.tii.ie/roads-tolling/operations-and-maintenance/traffic-count-data/

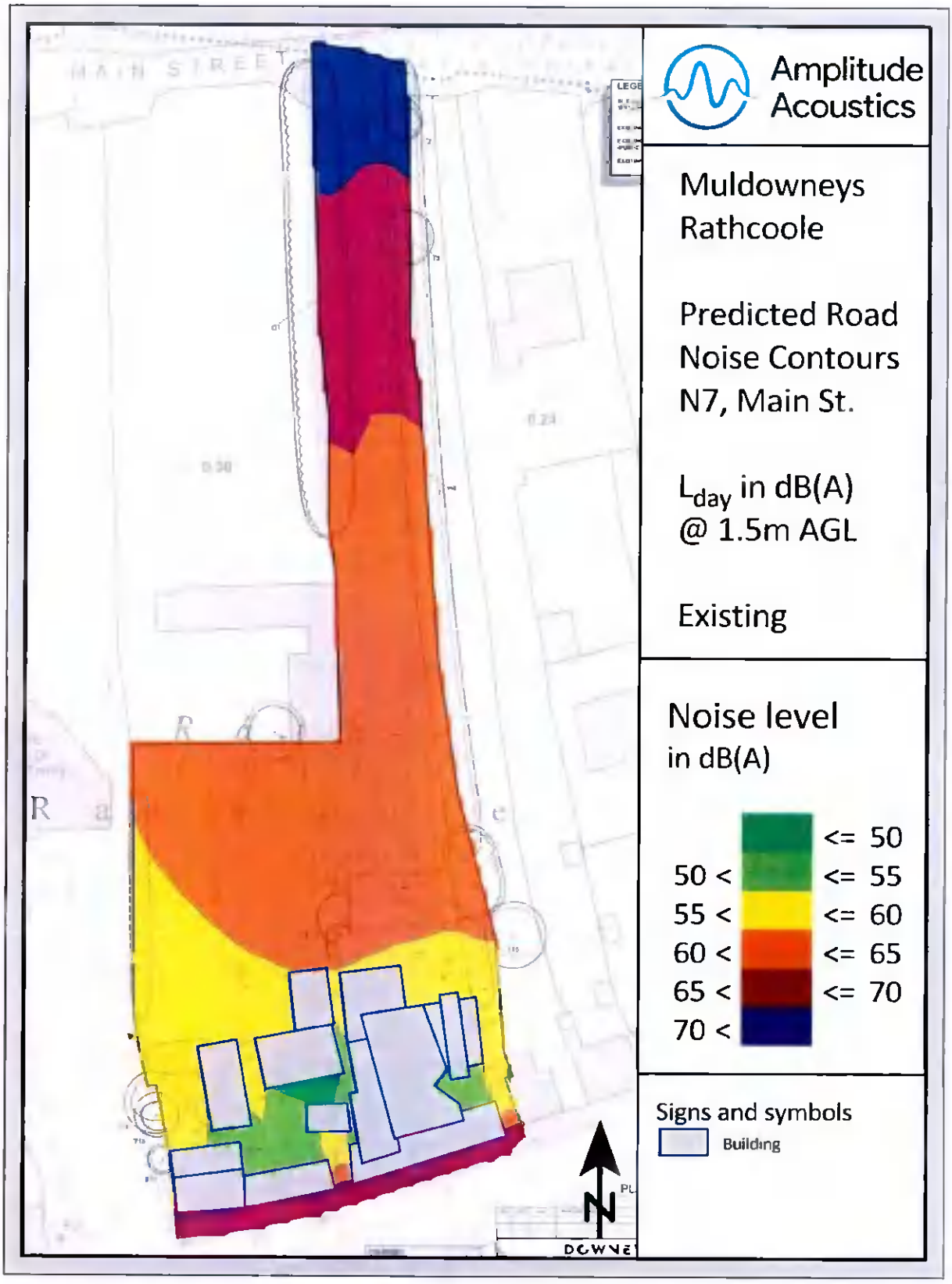

Figure 2: Daytime noise levels across site for ProPG risk assessment.

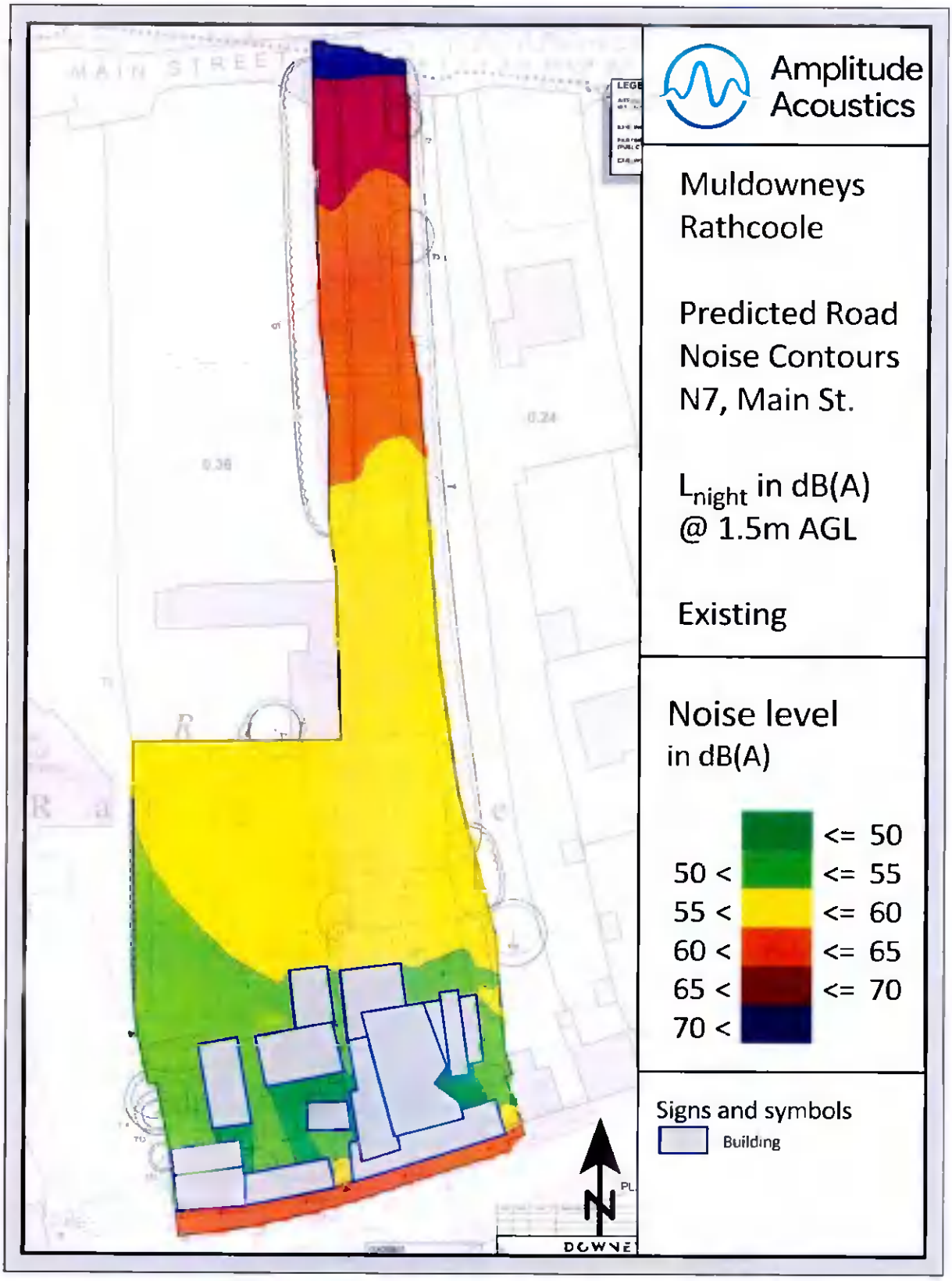

Figure 3: Night-time noise levels across site for ProPG risk assessment.

5.3 ProPG Risk Assessment

The predicted existing noise contour bands, validated by real site measurements, across the proposed development site enable a ProPG Noise Risk Assessment to be conducted for the site. The range of predicted noise levels within the site boundary are as follows:

- L_{day}: 45 – 75dB $L_{Aeq,\ 16\ hour}$
- L_{night}: 40 – 70dB $L_{Aeq,\ 8\ hour}$

The ProPG Noise Risk Assessment for the proposed development is presented in Table 6 below.

Table 6: ProPG Noise Risk Assessment for the proposed development site.

Indicative Daytime Noise $L_{Aeq,\ 16\ hour}$	Site Traffic Noise Level Range Measured/predicted	Indicative Night-time Noise $L_{Aeq,\ 8\ hour}$	Site Traffic Noise Level Range Measured/predicted
75		65	X
High	X	High	X
70	X	60	X
65	X	55	X
Medium	X	Medium	X
60	X	50	X
55	X	45	X
Low	X	Low	X
50	X	40	X
Negligible		Negligible	

It can be seen from the above that traffic noise levels for the development site are classified as Low to High risk across the site during the daytime, and Low to High risk across the site during the night-time. This indicates that traffic noise is a key issue for the site and that measures are required to ensure that internal and external noise levels comply with the guidance of ProPG 2017, BS8233 and WHO Guidelines.

5.4 Predicted Traffic Noise Contours

Figure 4 below shows the predicted future daytime noise, L_{day}, across the site with the proposed site layout. It can be seen from the contour map that Block A of the proposed development benefits greatly from acoustic screening provided by the location of Block B. Figure 5 further outlines the predicted future night-time noise levels, L_{night} across the site, also showing the acoustic benefit of screening from the introduction of Block B.

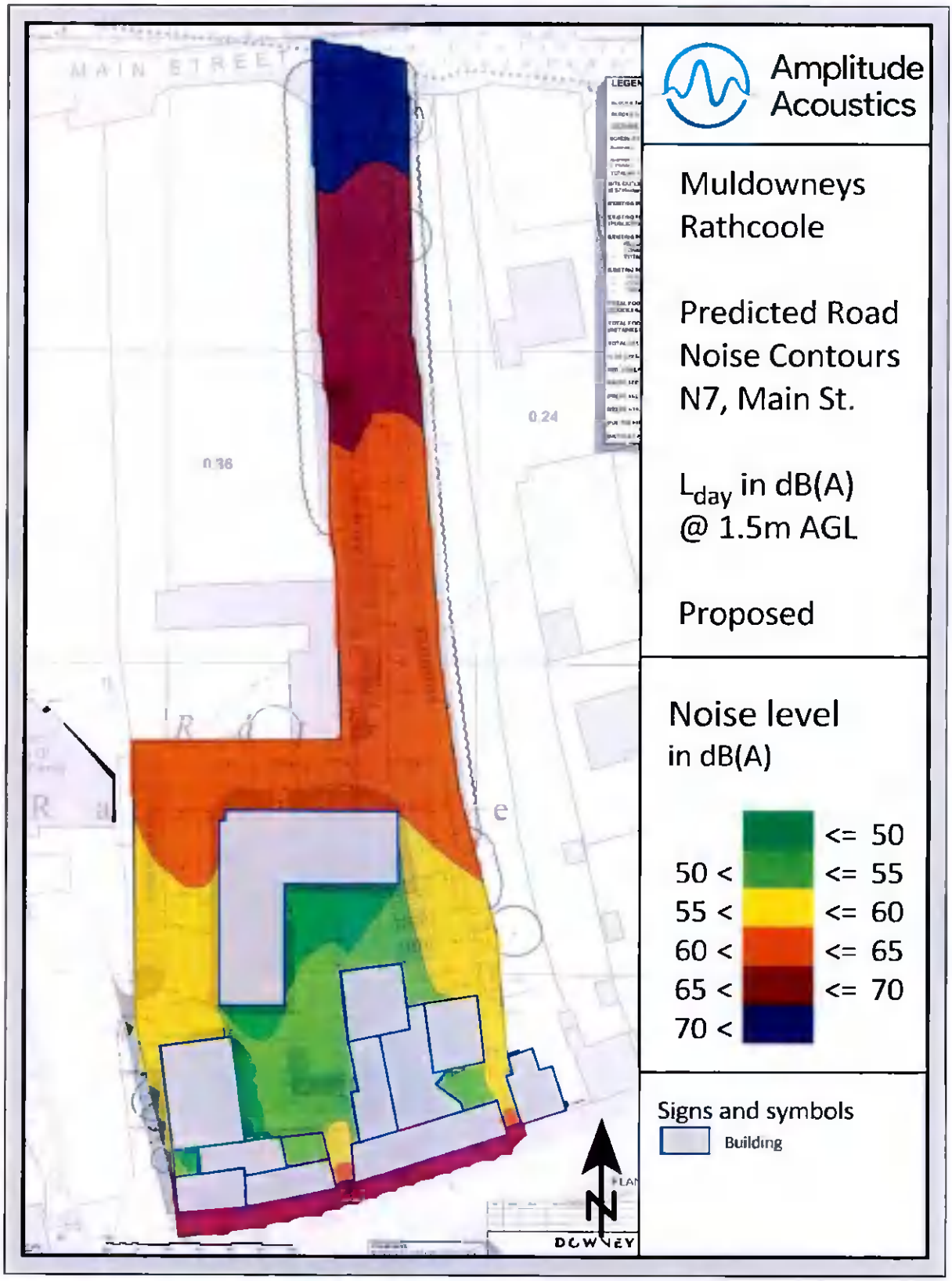

Figure 4: Predicted future daytime noise levels across the site.

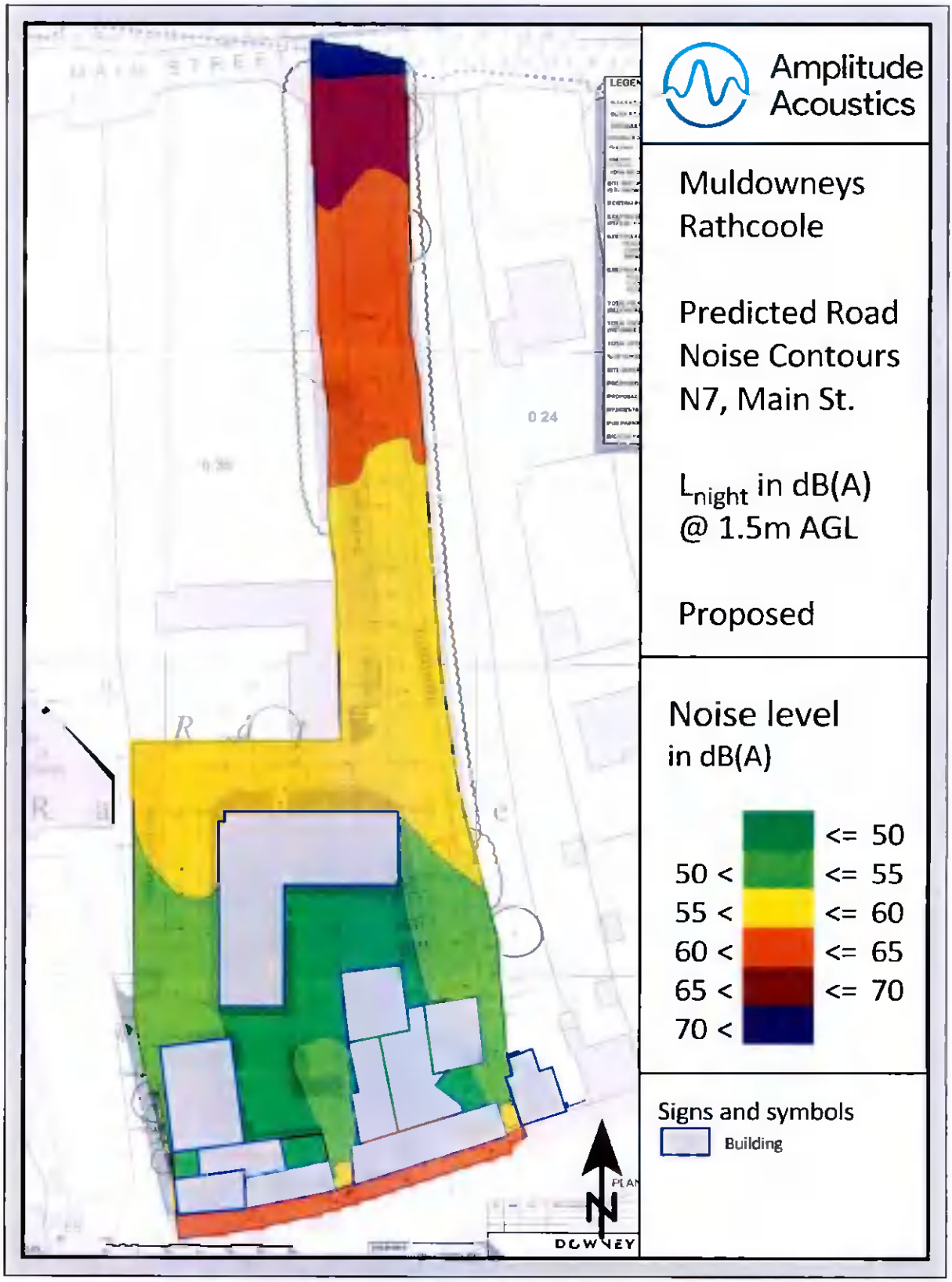

Figure 5: Predicted future night-time noise levels across the site

5.5 Entertainment Noise from Public House

To predict impacts due to noise from the Public House, noise from the outdoor areas has been modelled in SoundPLAN as follows:

- The proposed uncovered outdoor area occupied by 42 (1/m²) patrons conversing in raised voice.
- Noise level of 75dBA @ 5m distance from the covered outdoor area.
- Noise spectra as detailed in Table 7.
- It has been assumed that:
  - There will be no amplified live music performances in the outdoor areas.
  - The covered area will include background music at low levels.

Table 7: A-weighted sound power levels associated with Patrons and Live Music used to predict break-out noise from proposed development

Description	Parameter	Source Noise Levels [dB] at Octave Band Centre Frequency (Hz)						
		63	125	250	500	1000	2000	4000
Noise from covered area @ 5m	L_{pA}	54	53	61	70	72	67	59
Raised voice of 1 patron	L_{wA}	42	61	69	72	75	76	75

Predicted cumulative façade noise levels for road traffic and entertainment noise have been considered in determining recommended façade sound insulation details.

5.6 Internal Noise Levels

Construction details required to achieve internal noise levels within the project criteria are outlined in Section 6 of this report.

5.7 External Amenity Areas

Some of the private external amenity noise levels on the South and West sides of the development, are predicted to be outside of the 'desirable external amenity levels' due to the traffic levels from the N7 and Rathcoole Main Street.

Under existing conditions, predicted noise levels for balconies on Block A are as follows:

- West façade: 60 – 62dB L_{day} ($L_{Aeq,16hr}$)
- East façade: 51 – 56 L_{day} ($L_{Aeq,16hr}$)

Under existing conditions, predicted noise levels for balconies on Block B are as follows:

- North façade: 64 - 66dB L_{day} ($L_{Aeq,16hr}$)
- West façade: 61 – 64dB L_{day} ($L_{Aeq,16hr}$)
- Northeast façade: 57 – 59 L_{day} ($L_{Aeq,16hr}$)
- South facades: 48 – 54 L_{day} ($L_{Aeq,16hr}$)
- Southeast façade: 50 – 56 L_{day} ($L_{Aeq,16hr}$)

Private amenity spaces for the cottage are predicted to have desirable noise levels due to perimeter walls of the spaces and screening from buildings.

ProPG 2017 states that areas intended for external amenity should ideally have noise levels in the range of 50 – 55dB L_{day} ($L_{Aeq,16hr}$). It also states, however:

> *"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."*

The noise levels across the general amenity space in between the buildings fall within the 'desirable external amenity levels' as can be seen in Figure 4 above due to the screening provided by Block B, Block A, and the buildings along Rathcoole Main Street.

5.8 Future Noise Levels

The current average rate of growth of vehicles on Irish roads is 3.9%[2] based on this the noise levels across the development are expected to rise by 1-2 dB over the next 10 years. A 1-2dB change in noise levels is generally considered an imperceivable change and therefore is not considered significant.

[2] https://www.tii.ie/tii-library/strategic-planning/nra-road-network-indicators/TII-National-Roads-Network-Indicators-2017.pdf

6 Construction Requirements

Based on the results of the measured noise levels, glazing requirements have been calculated to achieve the required internal noise levels in accordance with BS 8233 (Table 1) at the proposed development.

6.1 Proposed Glazed Elements, Windows and External Doors

The indicative façade glazing requirements for the development are shown in Table 8. Appendix A shows a mark-up of the required glazing types with regard to layout of the proposed the development. It is a requirement that the full composite system including the window frame has, as a minimum, the same sound insulation performance as the glazing specified. The glazing specification provided below is intended for residential dwelling spaces only (bedrooms and kitchen / living areas) and there is no requirement for glazing leading to communal space corridors.

Table 8: Glazed elements, windows and external doors requirements.

Type	Glazed Elements, Windows and External Doors Acoustic Performance R_w[1]	1/1 Octave Band Indicative Performance Requirements (equal or approved) R dB					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Type A	34	24	26	22	29	35	41

1. The performance of a double and triple-glazed system is significantly improved by varying the pane thicknesses, e.g. 1 x 4mm pane + 2 x 6 mm panes. Different glazing options which achieve the acoustic performance requirements can be considered.

Internal noise level predictions are based on the sound transmission loss performance of typical glazing where no manufacturer is nominated. The glazing configurations presented in Table 8 are indicative only. Glass from various manufacturers is available that will meet the acoustic performance requirements, however any proposed glazing should be approved by an acoustic consultant prior to selection.

It is acoustically preferable for windows to be of a hinged (awning) construction and have cam locks to ensure a compression seal is achieved. In this case, windows are to have compression rubber seals around the perimeter.

Where glazed sliding doors and windows are located on facades, the glazing and framing of the doors is required to match the acoustic performance of fixed glazing.

6.2 Ventilation Systems

Ventilation systems have the potential to impair the acoustic performance of a façade system. Standard passive ventilation grilles offer minimal acoustic performance and are not suitable for some facades on this development. Should natural ventilation be selected on facades all ventilation will need to be acoustically rated. Ventilation systems (including trickle and room vents) will be required to achieve:

- Facades with Type A glazing should have ventilation systems which achieve a $D_{n,e,w}$ of 37 dB

All facades are suitable for mechanical ventilation. For natural ventilation the façade and ventilation requirements are based on achieving the ventilation requirements with the windows closed and a maximum of one (1) trickle vent in the bedrooms and a maximum of two (2) in the living areas with the above referenced acoustic performance. Should additional vents be required to achieve the ventilation requirements the acoustic consultant should be advised.

6.3 External Wall Constructions

The external wall construction of the proposed development should be designed to achieve an acoustic performance of R_w 55dB or above. Typical brick and timber framed constructions normally achieve this value.

6.4 Roof Constructions

The roof construction should be designed to achieve an acoustic performance of R_w 50 dB or above. All penetrations through the roof/ceiling system should be filled with insulation, faced with plasterboard and sealed with a resilient acoustic sealant.

6.5 External Amenity Spaces

6.5.1 Outdoor Communal Amenity Spaces at Ground Level

On review of the predicted daytime noise levels at ground level across the development, the central amenity space will naturally comply with the ProPG and BS8233 criteria for desirable external noise levels as it benefits greatly from the proposed layout of the buildings.

6.5.2 Cottages Private Outdoor Amenity Spaces

On review of the predicted daytime noise levels at ground level across the development, the Cottages amenity spaces will naturally comply with the ProPG and BS8233 criteria for desirable external noise levels as they benefit greatly from the proposed layout of the buildings and the inclusion of perimeter walls.

6.5.3 Blocks A and B Balconies

Winter gardens are recommended in preference to balconies for certain facades of Blocks A and B.

Winter gardens are recommended for Block A as follows:

- West façade (predicted 60 – 62dB L_{day} ($L_{Aeq,16hr}$))

Winter gardens are recommended for Block B as follows:

- North façade: (64 - 66dB L_{day} ($L_{Aeq,16hr}$))
- West façade: (61 – 64dB L_{day} ($L_{Aeq,16hr}$))
- Northeast façade: (57 – 59 L_{day} ($L_{Aeq,16hr}$))

ProPG External Amenity Area Noise Assessment Element 3(v) specifically 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 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 large open balcony in a different, protected, location); and/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."*

Although the predicted noise level for the topmost balconies on the east façade of Block A and the southeast façade of Block B marginally exceeds the desirable external noise level, this is offset by the ground level outdoor amenity spaces of the development which will naturally comply with this level and offer suitable alternate outdoor amenity for future residents.

7 Conclusions

Amplitude Acoustics have assessed the existing noise levels at the site of a development proposed at Muldowneys Pub, Rathcoole, Co. Dublin. The development includes the construction of 21 new build apartments, the refurbishment of an existing house into 2 apartment units (total of 23 units) and associated tenant amenity spaces.

The traffic noise at the site has been measured using attended measurements. A traffic noise model has been developed and calibrated using the measured noise levels. The traffic noise model was modified to predict the 10-year forecast traffic noise levels based on a forecast traffic volume increase. The effect of lower traffic volumes due to Covid 19 restrictions has been considered. Using the measured noise levels, the acoustic performance requirements for the building have been developed to achieve the internal noise levels defined in BS 8233 and ProPG.

Interior noise levels for the whole development are predicted to comply with interior sound levels from BS 8233 and ProPG provided that the construction requirements detailed in Section 6 are implemented.

Noise emissions from the Public House have been predicted and considered in determining façade sound insulation requirements.

The central communal amenity space at ground level is predicted to comply with the recommended levels of ProPG. The Cottages amenity spaces will also comply with the ProPG and BS8233 criteria for desirable external noise levels as they benefit greatly from the proposed layout of the buildings and the inclusion of perimeter walls.

Winter gardens have been recommended in place of balconies for private external amenity spaces located on certain facades of Blocks A and B.

Appendix A – Glazing Mark Up

Amplitude Acoustics

Title:
Glazing Mark Up
Muldowneys Rathcoole

Client:
Downey Planning

Legend

Glazing Performance

Rw 34 dB

AMPLITUDE REVIEW
Date: 24/01/2022
Revision: 2
Project Number: D210105

G2 The Steelworks
Foley St
Dublin 1
t: +353 1 442 8991
www.amplitudeacoustics.com