WAVE DYNAMICS
ACOUSTIC CONSULTANTS

Belgard Square

Acoustic Design Statement
03 November 2025

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www.wdacoustics.com

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Executive Summary

Wave Dynamics were engaged by Midsal Homes 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 Belgard Square, Belgard Road, Tallaght, Dublin 24.

The development will consist of the following:

Midsal Homes Limited intends to apply for permission for a Large-Scale Residential Development (LRD) at a site of approximately 1.19 Ha at Belgard Square East, Belgard Road and Old Blessington Road, Tallaght, Dublin 24. The main development site (approximately 0.91 Ha) is generally bound: to the north by Old Blessington Road; to the east by Belgard Road (R113); to the south by McDonald's Restaurant property (D24 HW74); and to the west by Belgard Square East. The site also includes parts of the carriageways and verges of Belgard Square East, Belgard Road and Old Blessington Road (approximately 0.28 Ha) for the provision of landscaping, 2 No. pedestrian crossings, accesses/junctions, minor road and footpath works, cycle infrastructure and water services infrastructure.

The proposed development principally comprises: the demolition and removal of existing boundary walls and railings on the main development site's eastern, western and northern sides; and the construction of a mixed-use development in 2 No. blocks (Block A to the south and Block B to the north) with a gross floor area of 23,540 sq m (excluding basement of 275 sq m) and ranging in height from 1 No. to 7 No. storeys (with mezzanine level) over basement.

The development includes a total of 199 No. residential dwellings (6 No. studios, 47 No. 1-bed, 98 No. 2-bed and 48 No. 3-bed) in the 2 No. blocks, with Block A comprising 49 No. 'senior living' apartment units and Block B comprising 150 No. 'standard' apartment units. The development also includes 2,123 sq m of non-residential floor space, with the following uses proposed: 4 No. retail units (totalling 331 sq m); 4 No. class 1 / class 2 commercial units (totalling 387 sq m); a bicycle sales and repair shop (81 sq m); an off-licence (64 sq m); a bar (151 sq m); a café (87 sq m); a medical centre (210 sq m); a dental practice (72 sq m); a pharmacy (195 sq m); a beauty/health salon (195 sq m); and a crèche (350 sq m) with external play area.

The development also comprises: an undercroft car park accessed via a new entrance/exit at Belgard Square East which provides 58 No. car parking spaces; a gated service lane to the south of Block A, with entrances/exits off Belgard Square East and Belgard Road; 2 No. pedestrian/cycle crossings, at Belgard Square East and Belgard Road; continuation of the northbound cycle lane from Belgard Road onto Old Blessington Road; alteration to the median and northbound right turn at Belgard Road onto Abberley Square; cycle parking; internal communal amenity spaces for the senior living units; hard and soft landscaping, including public open space, communal amenity space and incidental spaces; private amenity spaces (as balconies and terraces facing all directions); boundary treatments; 2 No. sub-stations; plant/operational rooms; bin stores; public lighting; blue roofs; rooftop PV arrays; lift overruns and rooftop opening vents atop both blocks; 4 No. 0.3 m diameter microwave link dishes mounted on 2 No. steel support poles affixed to the Block B lift overrun, all enclosed in radio-friendly GRP shrouds; 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 Belgard Road and the Old Blessington Road which dominate the noise levels in the area. 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 road noise impact 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 low risk across the entirety of the site.

Consideration has also been given to the fact that the site lies 5km from the edge of the Casement Aerodrome runway. The noise measurements were undertaken during peak road traffic times.

Break-in noise calculations to predict the internal noise levels from road traffic and operational noise from the adjacent McDonald's Drive Thru 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, roof and ventilation requirements.

External Amenity Noise Levels

The external amenity spaces on the development include balconies on the apartments, public plaza space at ground level and podium communal amenity spaces at first floor level. Appropriate amenity has been provided on the development for residents using a combination of the balconies on suitable facades, public plaza space at ground level and podium communal amenity spaces at first floor level. This is in line with element 3(v) of ProPG.

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.

Operational Noise Impact Assessment

An operational noise impact assessment has been conducted to assess noise generated from the operation of plant and equipment and the various commercial units located on the ground floor of the proposed development such as a bar, café, creche, various retail units, class 1/class 2 commercial units, pharmacy, beauty/health salon, off licence, bicycle repair shop, medical centre, and a dentist. It is predicted that operational noise from the proposed development will not cause a negative noise impact on the nearby noise sensitive locations during both daytime and nighttime operations The mechanical plant and equipment specification is not available at this stage of the project.

Based on the assessment outlined in this report it is predicted that noise generated by the proposed development will achieve project criteria.

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1 Introduction

Wave Dynamics were engaged by Midsal Homes 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 Belgard Square, Belgard Road, Tallaght, Dublin 24.

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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 Cathal Reck, Technical Engineer with Wave Dynamics who has extensive experience of planning stage noise assessments. Cathal's qualifications include; BSc (Hons) in Music Technology & Production, Certificate of Competence in Environmental Acoustics (IOA). Cathal is a member of the Institute of Acoustics (TechIOA) and a SITRI certified sound insulation tester.

The peer review was completed by Sean Rocks, Director | Senior Consultant, Sean has experience of numerous planning stage assessments. Sean's qualifications include; BEng (Hons) in Mechanical and Manufacturing Engineering, Diploma in Acoustics and Noise Control (Institute of Acoustics), IOA Certificate of Competence in Environmental Noise Measurement and SITRI certified sound insulation tester. Sean is a member of both Engineers Ireland and the Institute of Acoustics.

2 Site Description

The site is located at Belgard Road, Tallaght, Dublin 24. The site is bounded by Belgard Square East (West), Blessington Road (North) and Belgard Road (East) followed by commercial units to the south, a carpark, residential and commercial units to the west, and offices to the north.

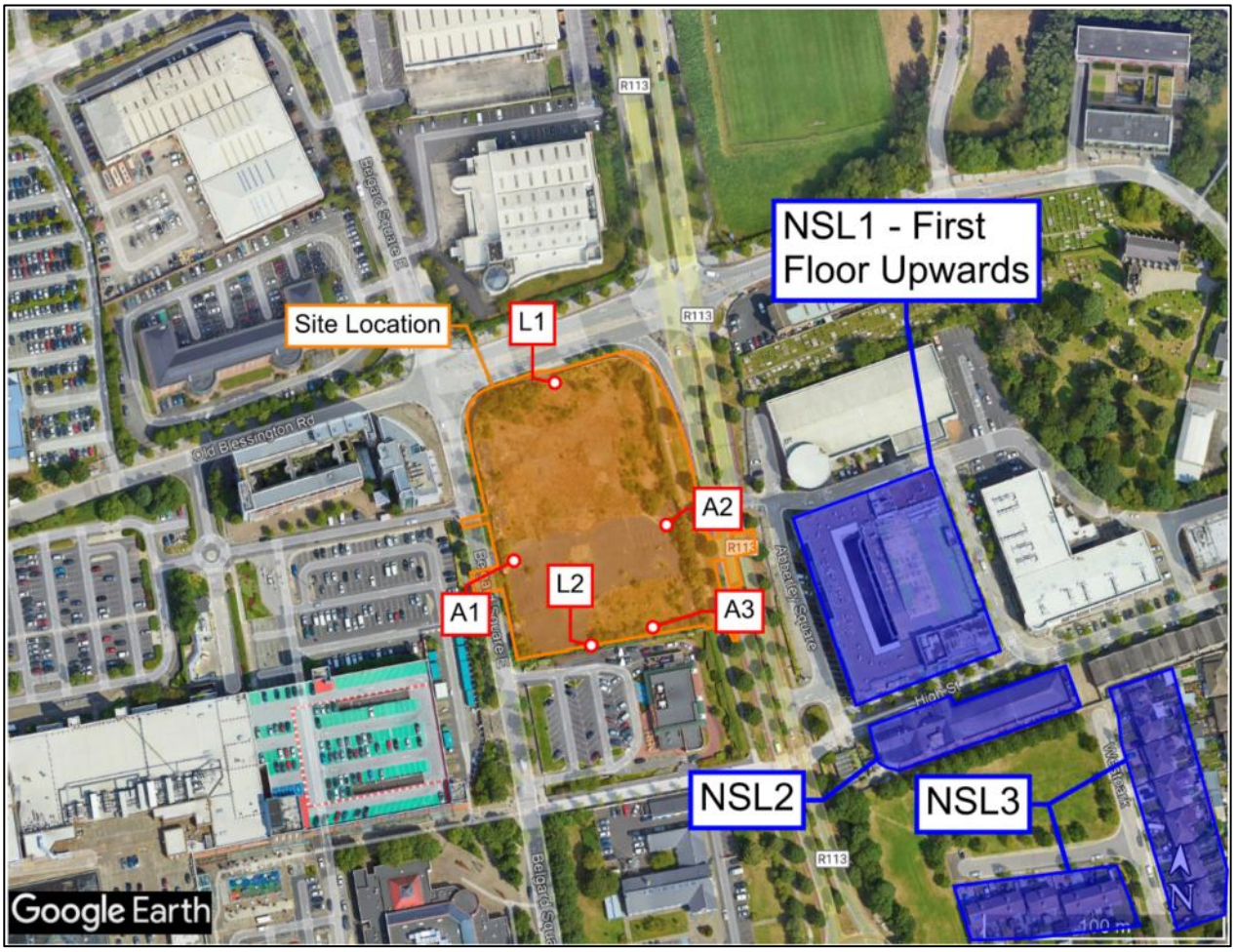


Figure 1: Measurement locations at A1, A2 and L1.

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.
- ✓ BS 4142 2014 A1+ 2019 Methods for rating and assessing industrial and commercial sound.
- ✓ EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).
- ✓ South Dublin County Council Development Plan 2022-2028.
- ✓ 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 one 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.

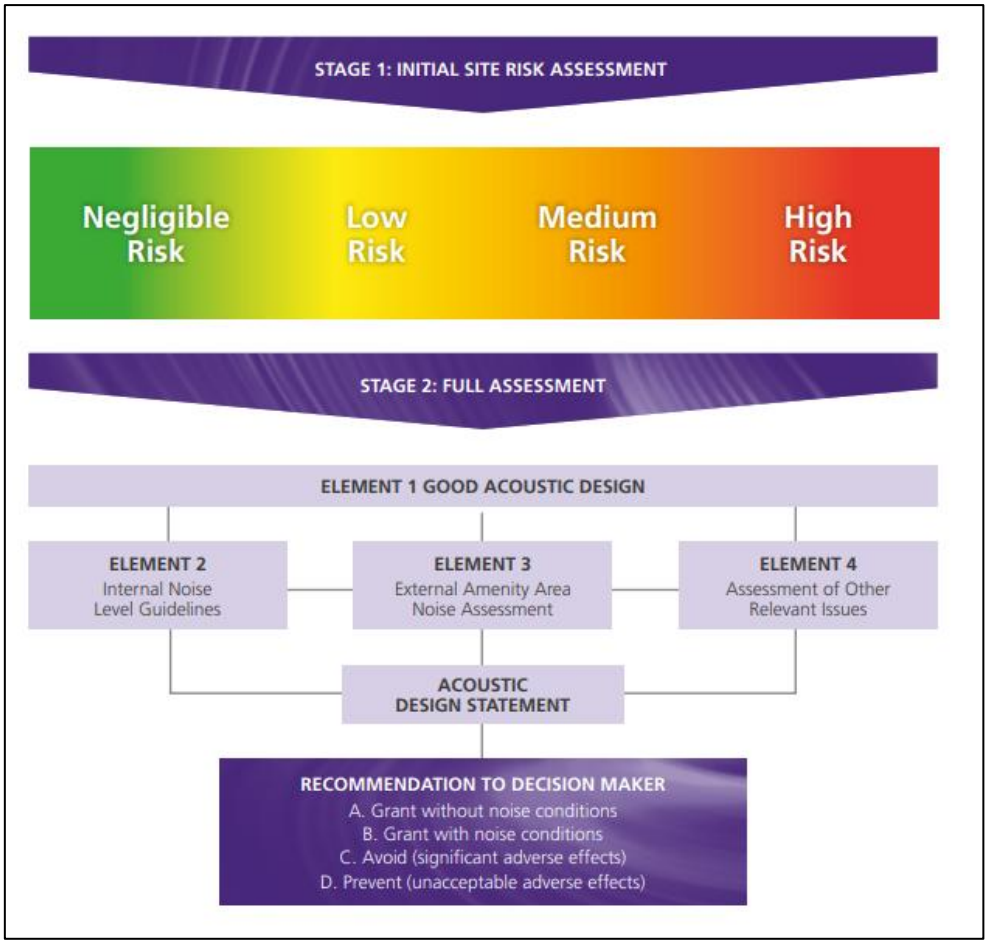


Figure 2: Summary of overall ProPG approach.

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 $L_{Aeq,\ 16\ hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,\ 16\ hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,\ 16\ hour}$	30 dB $L_{Aeq,\ 8\ hour}$ 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.

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, publically 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.

3.2 Operational Noise Impact Assessment Criteria

Local authorities can set noise limits from typical residential developments pertaining to noise however there is currently no national policy for operational noise limits from residential developments for planning noise assessments. Noise limits for new developments are typically sought from local council's noise action plan, EPA NG4 or BS4142. On review of the Dublin Agglomeration Noise Action Plan 2024-2028 no specific guidance has been outlined for noise limits from commercial premises and therefore the criteria from EPA NG4 and BS4142 has been adopted for the project.

BS 4142:2014+A1:2019

The standard describes a method for the assessment of commercial, industrial and background noise to quantify its impact on persons outside of a residential dwelling. BS 4142 has become the de facto standard for compliance investigation. In addition to the specified broadband noise levels the standards provide objective and subjective

methods for the assessment of the impulsivity and tonality of the noise sources. This allows for a penalty/ correction to be applied to the measured noise level of the source (L_{Aeq}) to give the rating level ($L_{Ar,T}$).

It considers the likelihood of complaints by considering the margin by which the noise source exceeds the background noise level.

BS 4142 states that any exceedance of the noise source of the background noise by:

- +10 dB or more indicates that complaints are likely,
- + 5 dB is of marginal significance, and;
- The rating level is more than 10 dB below the measured background noise level, then this is a positive indication that complaints are unlikely.

BS4142 outlines guidance for penalty corrections to be applied to the noise sources in question should the noise source have one of the following characteristics:

- The noise contains a distinguishable, discreet, continuous tone (whine, or hum);
- The noise contains distinct impulses (i.e. bangs),
- The noise is intermittent or:
- The noise is irregular.

EPA NG4

EPA NG4 outlines that noise attributable solely to onsite activities from a licenced premises should not exceed the following limits:

- *Daytime (07:00hrs – 19:00hrs) – 55dB $L_{Ar,T}$*
- *Evening (19:00hrs – 23:00hrs) – 50dB $L_{Ar,T}$*
- *Night time (23:00hrs – 07:00hrs) – 45dB $L_{Aeq,T}$*

During daytime and evening periods rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all sensitive locations. A penalty of 5dB for tonal and/or impulsive elements is to be applied to the daytime and evening measured $L_{Aeq,T}$ values to determine the appropriate rating level ($L_{Ar,T}$). In all cases, an assessment by a competent person will be required.

During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL.

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.

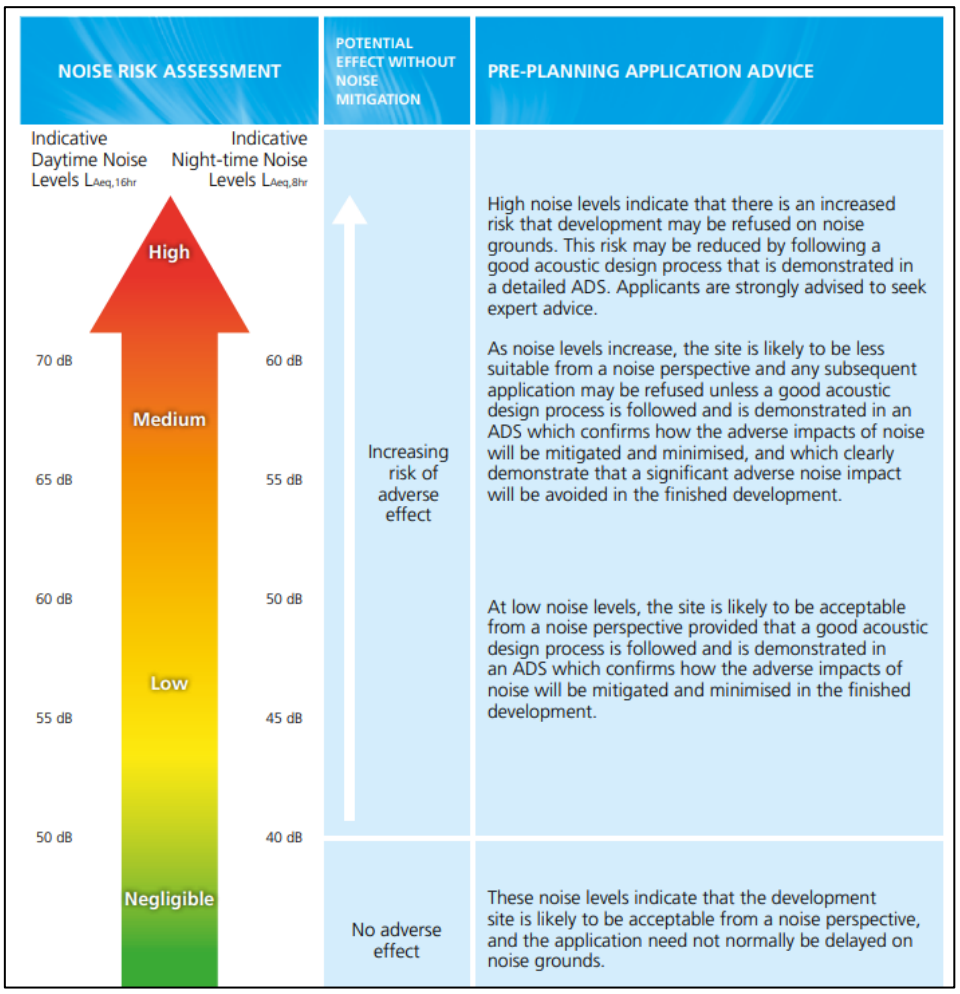


Figure 3: ProPG Risk Analysis

5 Baseline Noise Survey

A baseline noise survey was conducted on the development lands at Belgard Square 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 aircraft noise 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 30th of September 2024 and the 3rd of October 2024. The unattended survey was conducted from the 30th of September 2024 at 14:43hrs and collected on 3rd of September 2024 at 10:32hrs

5.1.1 Site Description and Measurement Locations

The site is located at Belgard Road, Tallaght, Dublin 24. The site is bounded by Belgard Square East (West), Blessington Road (North) and Belgard Road (East) followed by commercial units to the south, a carpark, residential and commercial units to the west, and offices to the north.

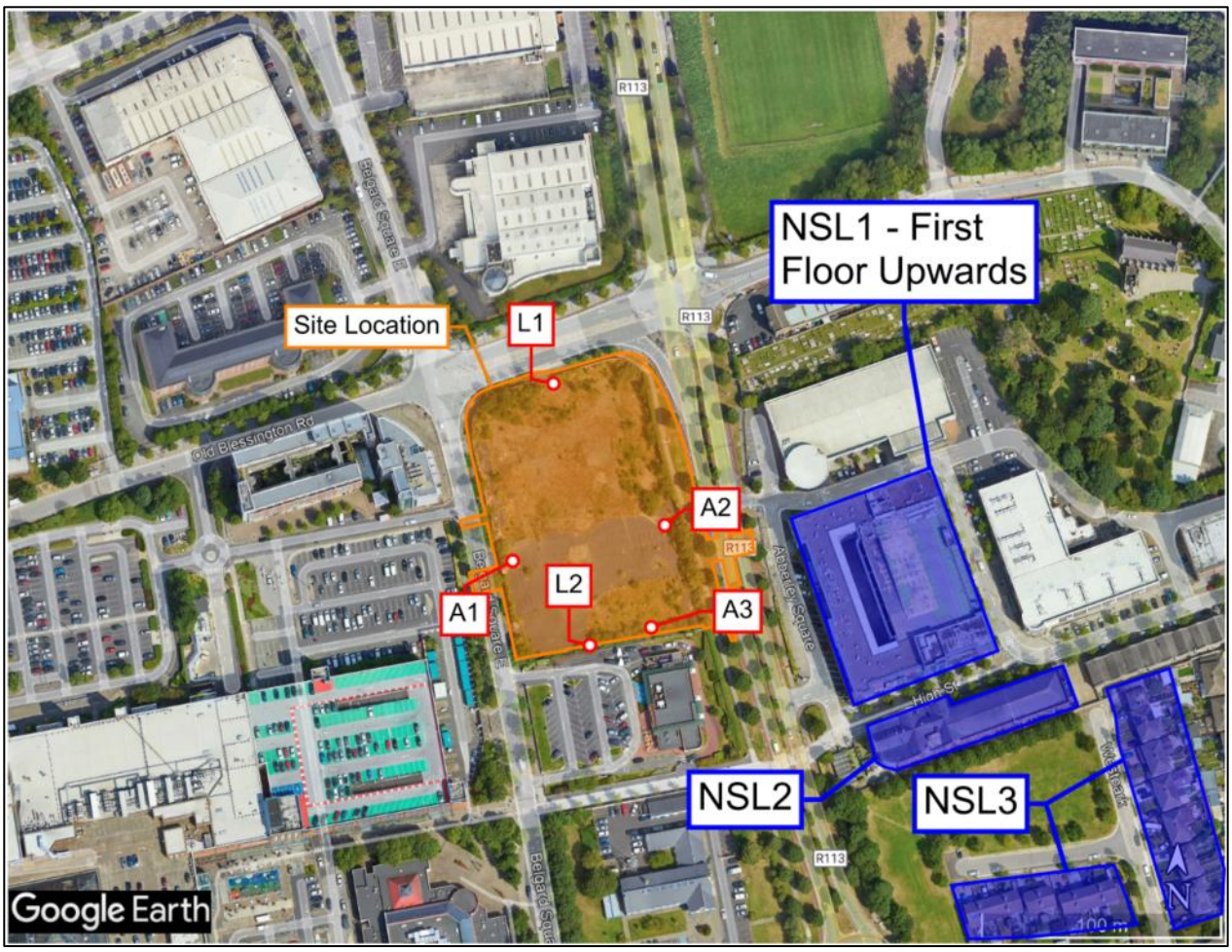


Figure 4: Site location and measurement locations L1, A1, A2 and A3.

5.1.2 Survey Methodology and Personnel

The baseline noise survey was completed by Daniel Cousins (Field Engineer). The attended noise measurements were undertaken on the 30th of September 2024, the 3rd of October 2024 and the 1st of May 2025. The unattended survey was conducted from the 30th of September 2024 at 14:43hrs and collected on 3rd of October 2024 at 10:32hrs.

Unattended Noise Measurements

An unattended noise logger was deployed in location L1. The monitor was deployed on the 30th of September 2024 at 14:43hrs and collected on 3rd of October 2024 at 10:32hrs. The logger was positioned approximately 3m 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).

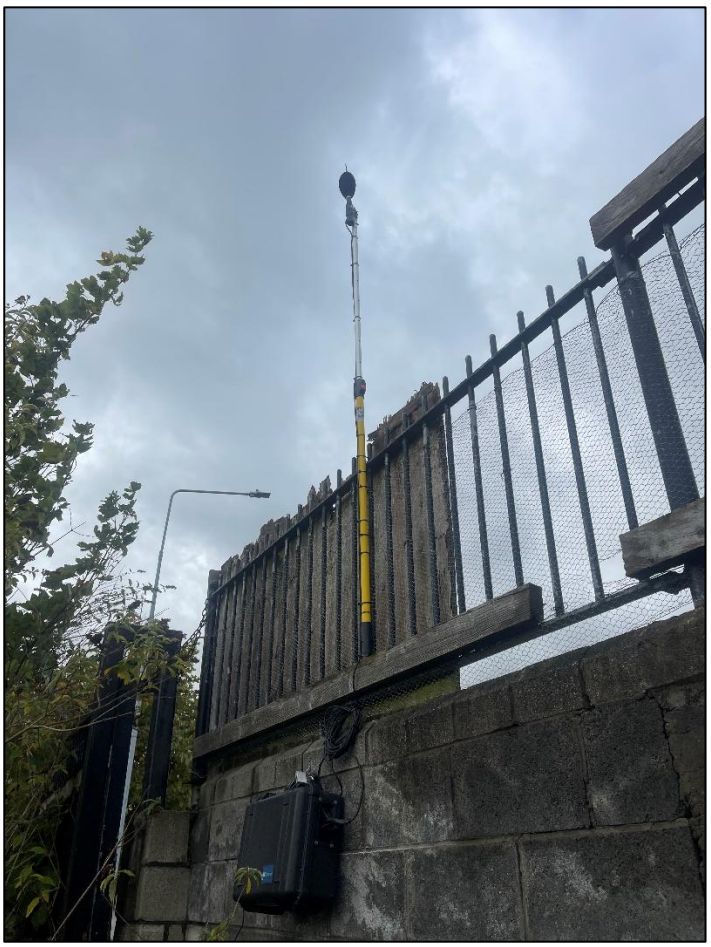


Figure 5: Unattended measurement setup at L1.

Figure 6: Unattended measurement setup at location L2.

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, A3 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, A2 and A3, 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 7: Attended Measurement Setup.

5.1.3 Survey Period

The unattended noise measurements were undertaken from the 30th of September 2024 to the 3rd of October 2024. Attended noise measurements were conducted on the 30th of September 2024, the 3rd of October 2024 and the 1st of May 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 2 below summarises the measurement equipment used.

Table 2: Noise Measurement Equipment

Description	WD Asset Number	Model	Serial No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter	SLM1	Nor 140	1405554	U45343/U45344 /45342	17/09/2027
Sound Level Meter	SLM2	Nor 140	1406532	UCRT25/2495	20/10/2027
Sound Level Meter	SLM4	Nti XL2-TA	A2A-23316-E1	UK-23-100	18/09/2027
Calibrator	CAL2	Cirrus CR 515	99866	AC230229	13/11/2025
Calibrator	CAL4	Larson Davis CAL200	21085	AC250309	22/07/2026

5.1.5 Subjective Noise Environment

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

- Road traffic noise
- Pedestrian noise
- Birdsong
- Wind blowing foliage

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 3 outlines the results of the attended measurement survey.

Table 3: Attended Noise Measurement Results

Measurement				Measured Noise Levels		
Location	Date	Time (hrs)	Duration (mins)	L_{Aeq} dB	L_{AFmax} dB	L_{A90} dB
L1	30/09/2024	14:26	15	63	77	55
A1	03/10/2024	10:29	15	61	73	50
L1	03/10/2024	10:33	15	59	72	52
A1	03/10/2024	10:44	15	62	73	51
A2	03/10/2024	11:03	15	60	70	56
A1	03/10/2024	11:06	15	61	75	52
A2	03/10/2024	11:19	15	62	72	55
A2	03/10/2024	11:36	15	60	67	55
A3	01/05/2025	15:12	15	52	64	50
A3	01/05/2025	15:27	15	53	64	50

Sound Exposure Measurement Results

Table 4 outlines the results of the attended measurements for driver thru operations at location A3. The drive thru sound exposure levels have been calculated from the measured L_{Aeq} levels.

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

$$L_{AX} = LAeq - 10*\log_{10}(N) + 10*\log_{10}(T)$$

Where:

L_{Ax} measured SEL
N number of vehicle movements
T time (seconds)

Table 4: Drive thru noise levels

Measurement				Source Type	Measured Noise Levels		Sound Exposure Level
Location	Date	Time (hrs)	Duration (s)		L_{Aeq} dB	L_{AFmax} dB	L_{AX} dB
A3	01/05/2025	15:44	00:26	Drive thru speaker in operation	50	58	64
A3	01/05/2025	15:46	00:22	Drive thru speaker in operation	52	58	65
A3	01/05/2025	15:49	00:43	Car passing in drive thru	51	54	67
A3	01/05/2025	15:54	00:07	Car passing in drive thru	54	56	63
A3	01/05/2025	15:55	00:08	Car passing in drive thru	52	53	61
A3	01/05/2025	15:56	00:11	Car passing in drive thru	53	55	63
A3	01/05/2025	15:57	00:30	Car idling in drive thru	54	57	69
A3	01/05/2025	15:57	00:10	Drive thru speaker in operation	52	53	62

5.2.2 Unattended Monitoring Results

Table 5 outlines the results of noise measurements at the unattended monitoring location L1. The noise logger was positioned 1.5m above ground level.

Table 5: Unattended noise measurement results for location L1.

Start Date	$L_{Aeq,16hour}$ 07:00 - 23:00 dB	L_{night} ($L_{Aeq,8hour}$ 23:00 - 07:00) dB	L_{den} (00:00 - 00:00) dB	10th highest night-time L_{AFmax} dB	L_{A90} (23:00 - 07:00) dB
30/09/2024	59[1]	51	61[1]	70	45
01/10/2024	59	50	61	70	44
02/10/2024	59	50	60	67	44
03/10/2024	58[1]	N/A	60[1]	N/A	N/A

(1) Shortened 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.

Additional unattended noise measurements were undertaken adjacent to the McDonalds Drive Thru, the purpose of these measurements was to measure the operational noise from the Drive Thru during the daytime, evening and nighttime periods to gain an understanding of the cumulative noise impact from the Drive Thru and the other noise sources in the surrounding area. Table 6 below outlines the unattended noise survey results from the noise logger deployed adjacent to the Drive Thru.

Table 6: Unattended noise measurement results for location L2.

Start Date	$L_{Aeq,16hour}$ 07:00 - 23:00 dB	L_{night} ($L_{Aeq,8hour}$ 23:00 - 07:00) dB	L_{den} (00:00 - 00:00) dB	10th highest night-time L_{AFmax} dB	L_{A90} (23:00 - 07:00) dB
19/06/2025	59[1]	51	62[1]	69	45
20/06/2025	57	52	60	71	46
21/06/2025	57	54	61	71	49
22/06/2025	57	53	60	71	48
23/06/2025	58	54	62	73	47

Start Date	$L_{Aeq,16hour}$ 07:00 - 23:00 dB	L_{night} ($L_{Aeq,8hour}$ 23:00 - 07:00) dB	L_{den} (00:00 - 00:00) dB	10th highest night-time L_{AFmax} dB	L_{A90} (23:00 - 07:00) dB
24/06/2025	58[1]	N/A	N/A	N/A	N/A

(1) Shortened 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.

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 8 below 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 below.

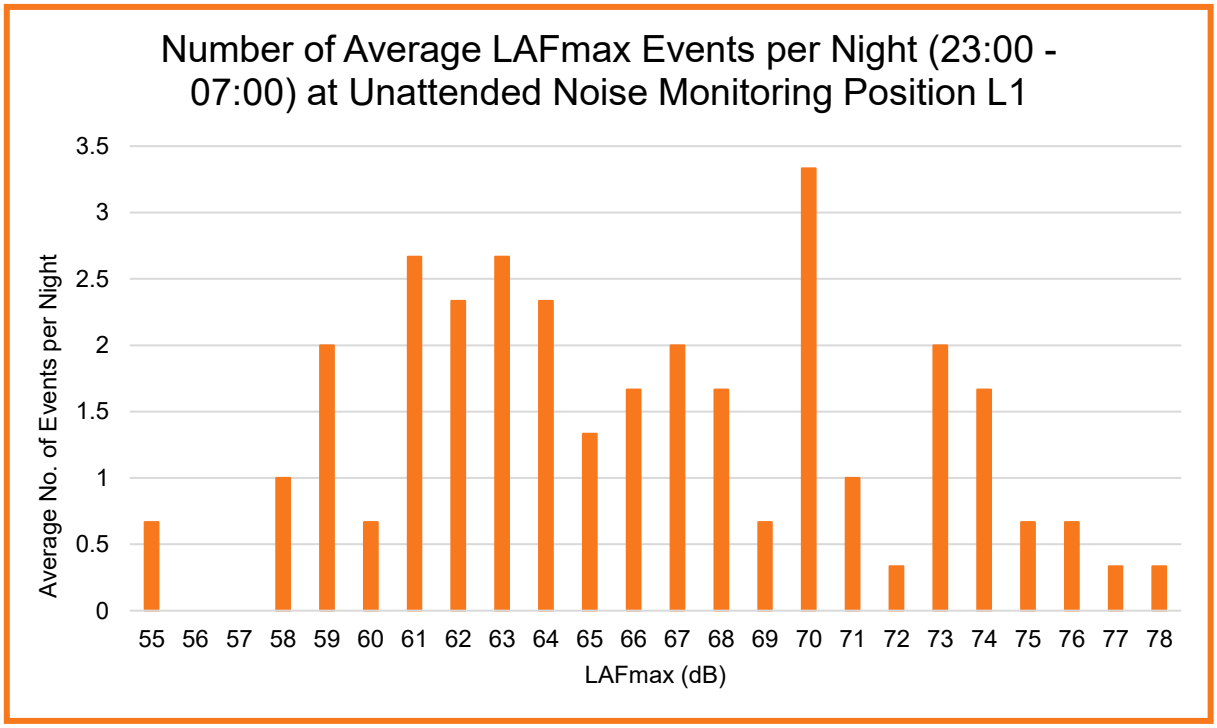


Figure 8: Average recorded L_{AFmax} events per night based on 15min measurement intervals at monitoring position L1.

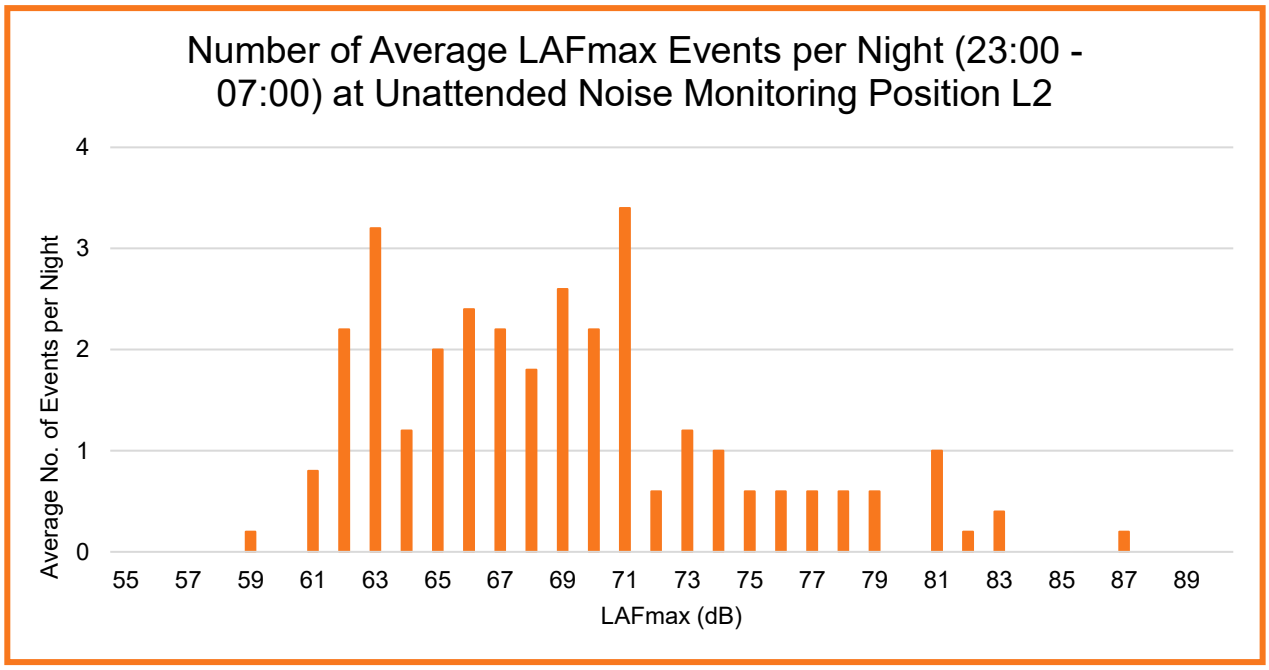


Figure 9: Average recorded L_{AFmax} events per night based on 15min measurement intervals at monitoring position L2.

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 nearby roads. Measurements at location A3 were undertaken to measure the noise levels of the McDonald's Drive Thru in operation. As can be seen from the measurement results, the onset noise levels from road traffic noise along R113 (A2) are significantly louder than the noise levels emitted from the Drive Thru in operation. An additional unattended logger was deployed at L2 to measure the Drive Thru over an extended period of time, as can be seen from the measurements, most of the noise measured was due to the surrounding road network and small contributions from the Drive Thru were noticed. The measurements taken at L2 were used to calibrate the noise model for the Drive Thru contributions.

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 weather conditions during the unattended survey impacted on the results they were filtered where required.

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.

Aircraft Noise

Consideration of the nearby Casement Aerodrome has been allowed for in this assessment. The closest edge of the Casement Aerodrome runway is approximately 5km from the proposed development site. Aircraft operations at Casement are typically restricted to daytime hours only generally 07:00hrs – 18:00hrs with typically less than 10 activities per day. There is no activity at nighttime. Additionally, the type of aircraft operating are small aircraft such as helicopters and small planes. There are no set departure/arrival paths for helicopters which are the most common aircraft type.

During the site visits there was no audible activity from operations of the Casement Aerodrome due to the dominating road traffic noise in the area. We are currently not aware of any plans to increase operations however an allowance has been made within the calculations for a doubling of the activity at the Casement Aerodrome.

Tallaght hospital has a helicopter landing pad and is located 550m from the site. The use of the helicopter pad at Tallaght Hospital is generally infrequent and only on emergency occasions and is typically only used during the daytime. An allowance has been made in the calculations for helicopter use at Tallaght Hospital.

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 development is located close to road noise sources which are not on or part of the development therefore it is not possible to reduce or relocate the relevant noise sources.

Site Layout and Orientation

Belgard Road and Old Blessington Road are major contributors to the noise levels in the area. The proposed apartment blocks provided large amounts of screening to the apartment units located on the internal courtyard and also the external amenity spaces on the development.

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 LAeq,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 9.0 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 9.0 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.

Daytime Noise Levels

Figure 10, Figure 11 and Figure 12 below outline the predicted road traffic noise levels across the proposed site for the day time period at 1.5m, 4m and 6.5m height respectively.

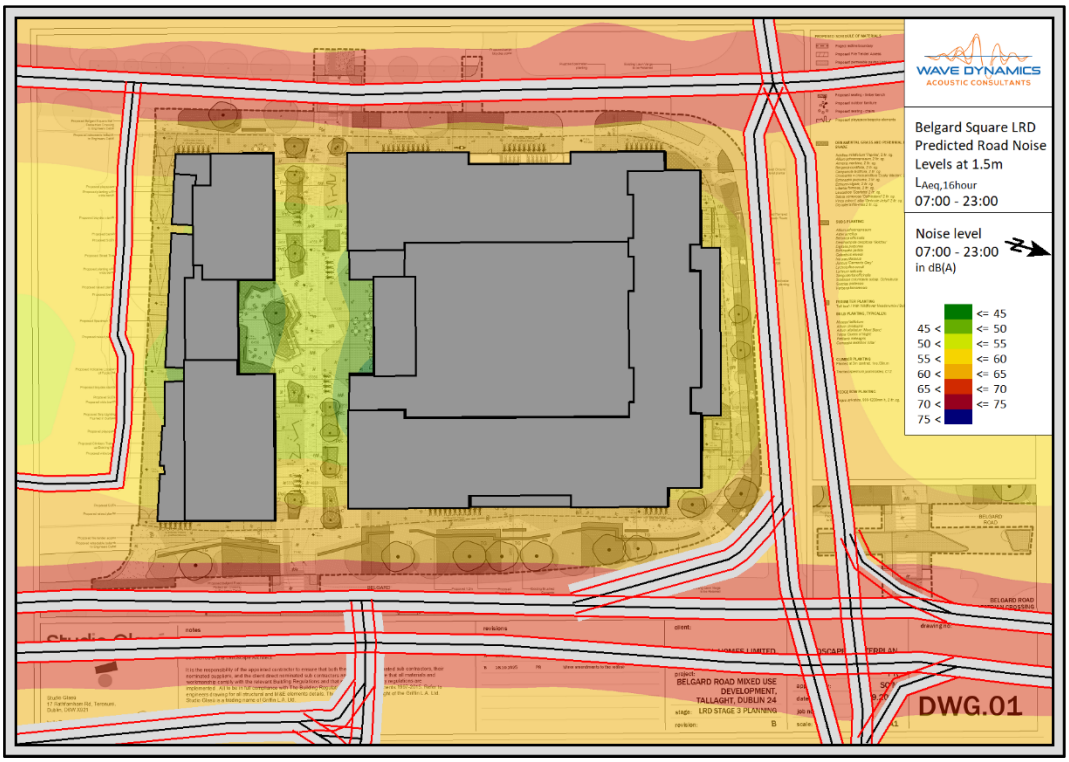


Figure 10: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 1.5m height for the future development.

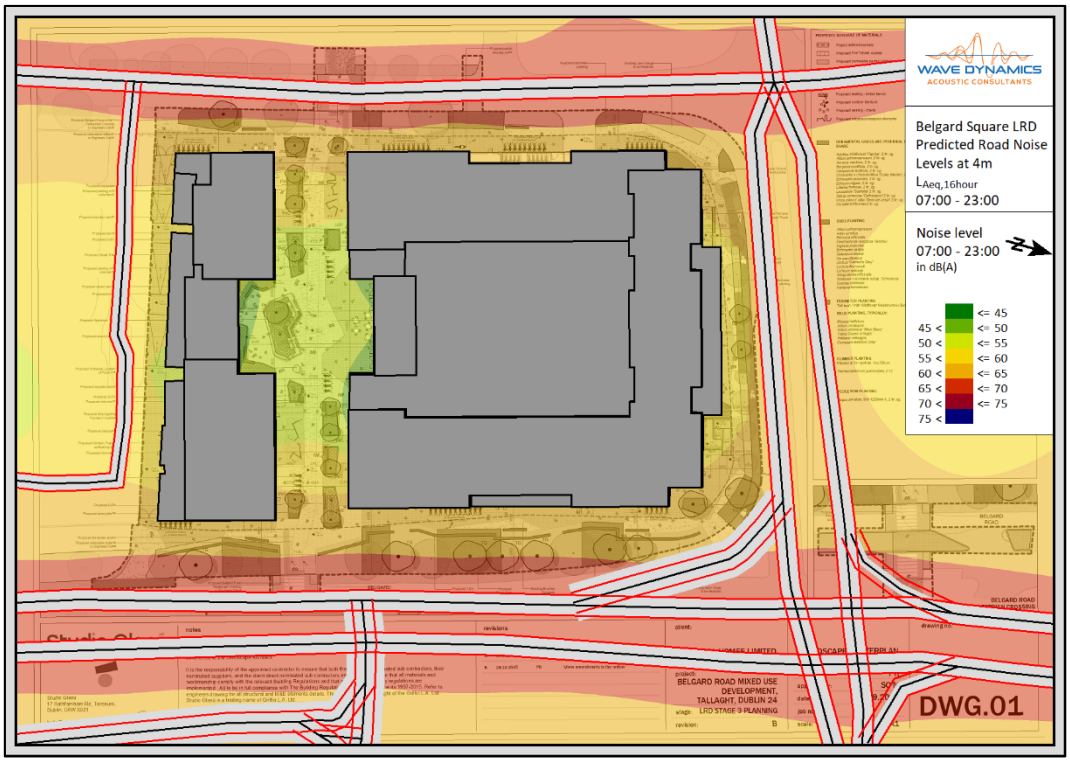


Figure 11: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 4m height for the future development.

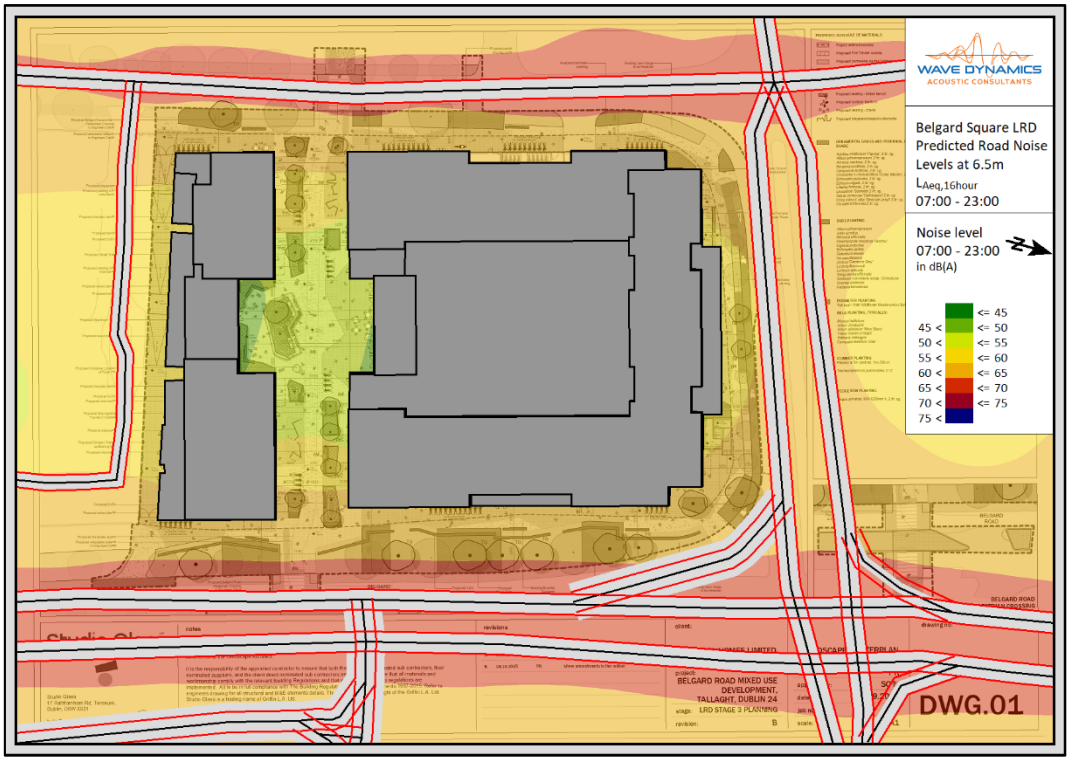


Figure 12: Predicted $L_{Aeq,16hour}$ (07:00Hrs – 23:00Hrs) at 6.5m height for the future development.

Nighttime Noise Levels

Figure 13, Figure 14 and Figure 15 below outline the predicted road traffic noise levels across the proposed site for the nighttime period at 1.5m, 4m and 6.5m height respectively.

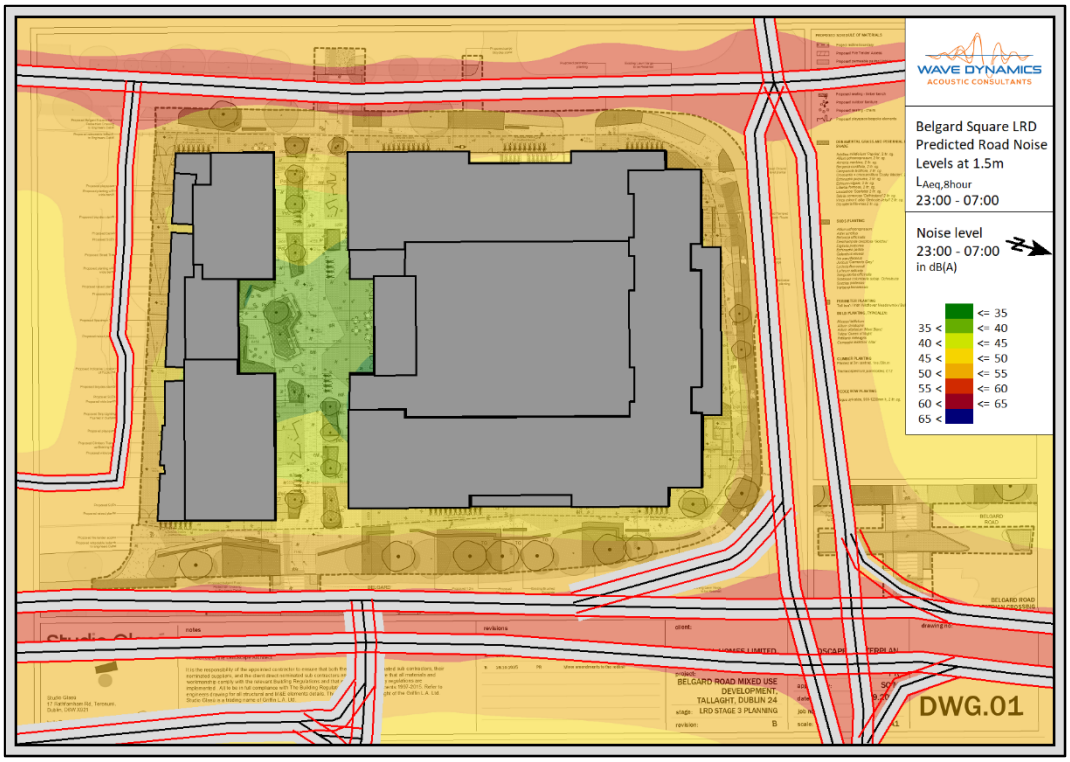


Figure 13: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 1.5m height for the future development.

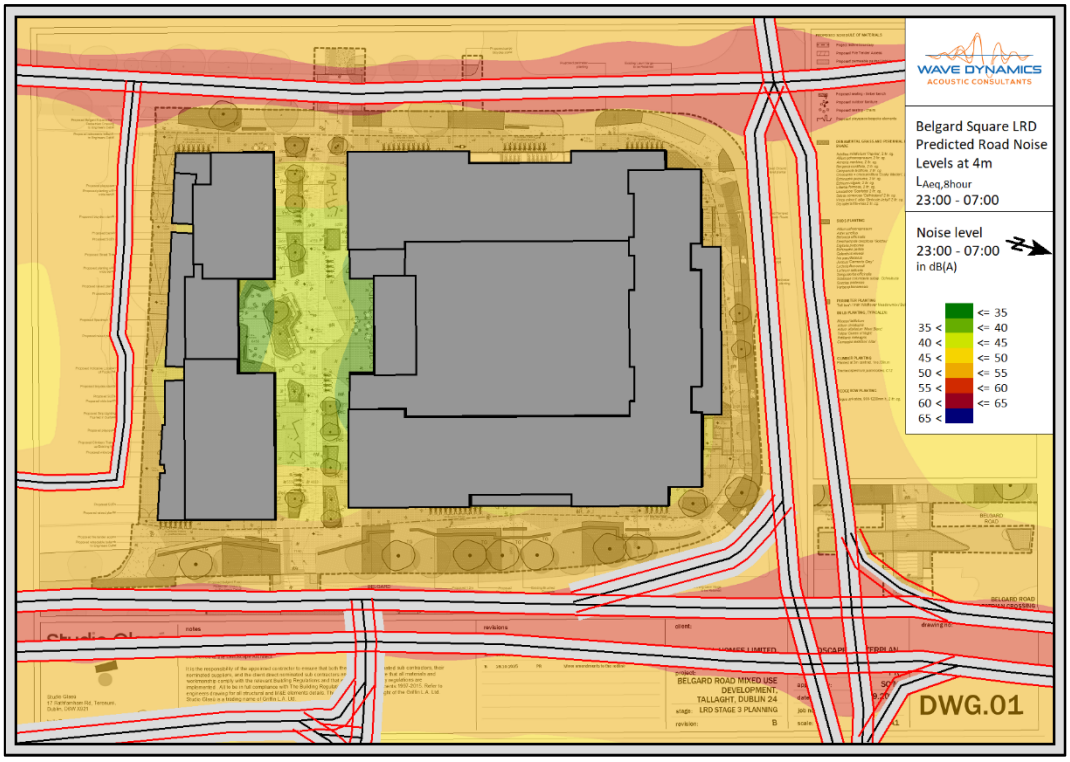


Figure 14: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 4m height for the future development.

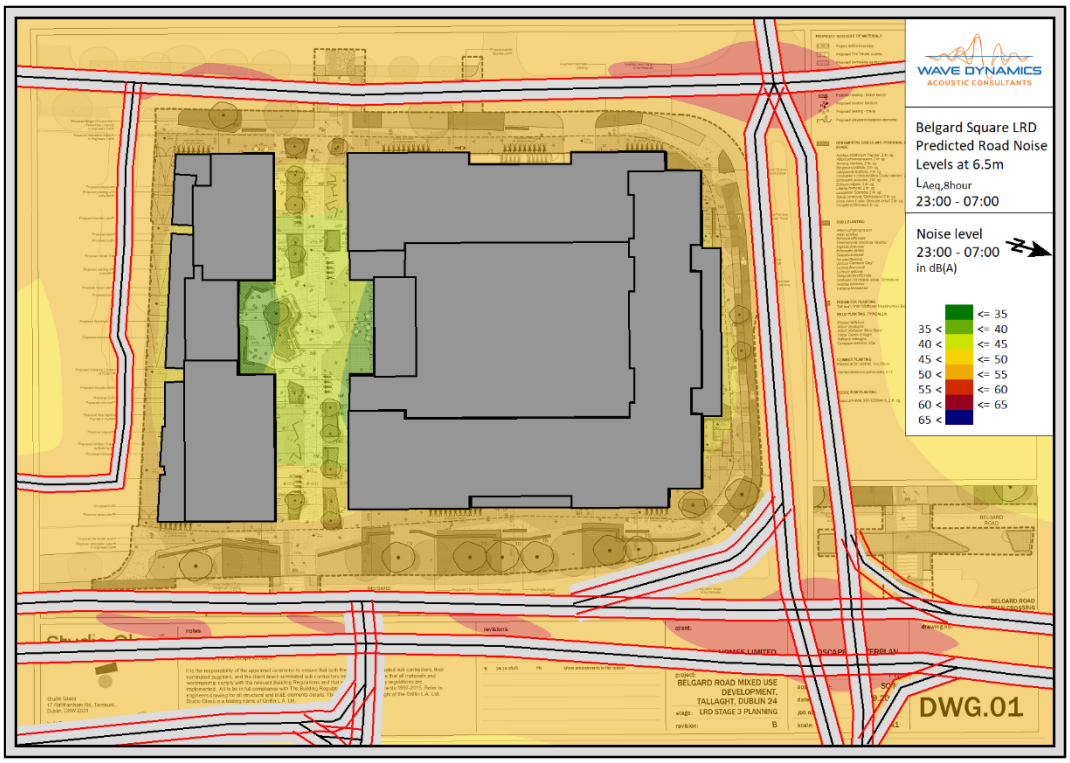


Figure 15: Predicted $L_{Aeq,8hour}$ (23:00Hrs – 07:00Hrs) at 6.5m height for the future development.

Local Access Roads

It should be noted that the development has a local access road from the proposed entry road onto the site at Belgard Road. 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 7 below.

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 7 below are considered to provide adequate sound insulation to achieve the relevant day and night internal design goals respectively.

Table 7: 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] R dB						Glazing Acoustic Performance dB R_W	
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
RED	28	26	28	37	35	31	33dB R_W	36dB $D_{n,e,w}$ (1) Natural Ventilation
BLUE	Standard Double Glazing							Standard Passive Ventilation

(1) Natural ventilation assumed throughout, the performance cited for the ventilator is in the open position. Should this change to mechanical ventilation the above specification may be reduced. An acoustic consultant should be engaged to assess the level of reduction appropriate to maintain the internal noise level criteria.

(2) The calculation assumes a maximum of 1 ventilation opening per bedroom at the above specification.

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 understand the ventilation strategy is proposed as a natural ventilation system. Based on the information provided to us on the ventilation system. Should the ventilation strategy change to a mechanical ventilation strategy an Acoustic Consultant should be engaged to provide an appropriate mechanical ventilation sound insulation performance requirement for any sealed 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 7 are based on the use of basic trickle vents. The performance value, and that used in the calcs is given in Table 8 below.

Table 8: Recommended ventilation specification

Façade	Description	Octave Band Centre Frequency (Hz) Sound Reduction Index $D_{n,e}$ dB					
		125	250	500	1k	2k	4k
RED	Acoustically rated trickle vent ≥ $D_{n,e,w}$ 36dB	35	30	31	34	45	43
BLUE	Standard non-acoustic trickle ventilator typically ≥ $D_{n,e,w}$ 29dB	29	29	29	29	29	28

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 for the apartments and public plaza space at ground level and podium communal amenity spaces at first floor level. All external amenity spaces have been assessed in line with the ProPG desirable external noise levels and it can be concluded that the balconies facing into the internal courtyard areas, the public plaza space at ground level and podium communal amenity spaces at first floor level will achieve the desirable external noise levels of ≤55dB $L_{Aeq,16hour}$ (07:00hrs – 23:00hrs) without mitigation.

The balconies on the eastern elevation facing onto Belgard Square East, the northern elevation facing onto the Old Blessington Road and the western elevation facing onto Belgard Road are all predicted to exceed the external desirable noise levels by <10dB. Suitable alternate external amenity is provided for these balconies on the development in the form of public plaza space at ground level and podium communal amenity spaces at first floor level. This is 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 16 below highlight the proposed external amenity spaces at ground and first floor level, Figure 17 below outlines the balconies on suitable façades that fall within the external amenity criteria.

Based on the measured noise levels at the site it is predicted that the external noise levels in suitable balconies and external amenity space across the development will achieve the ProPG recommendations for desirable external amenity noise levels of 50-55dBA $L_{Aeq,16hour}$.

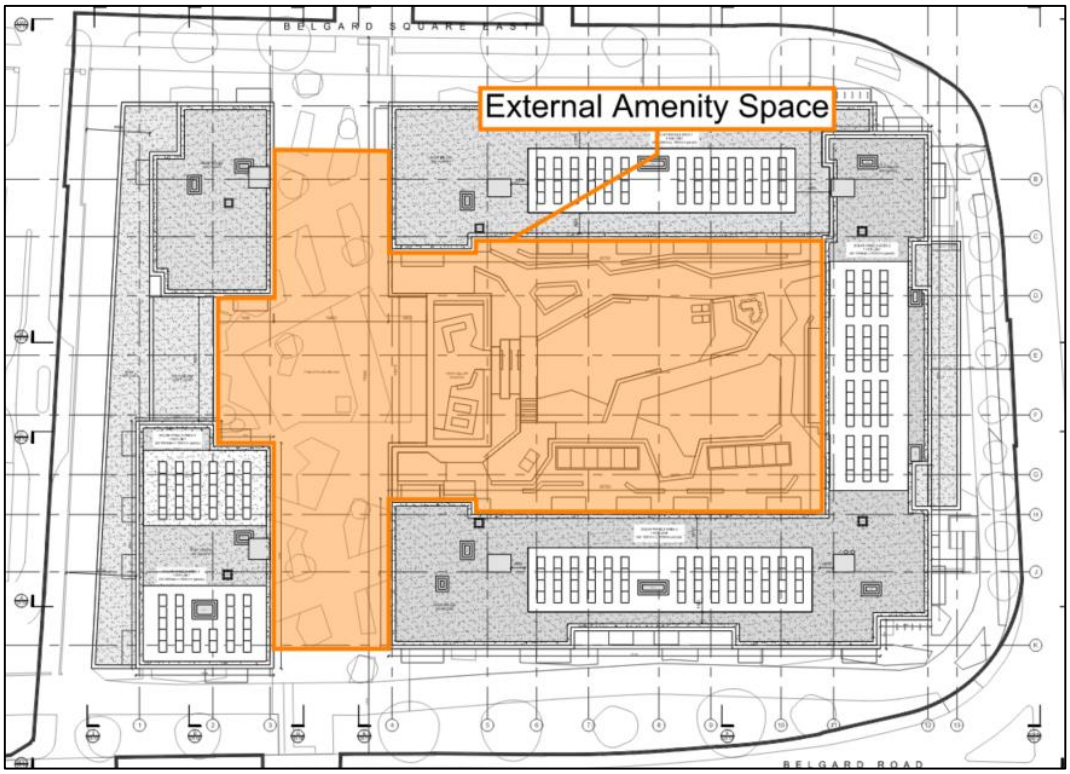


Figure 16: External amenity space.

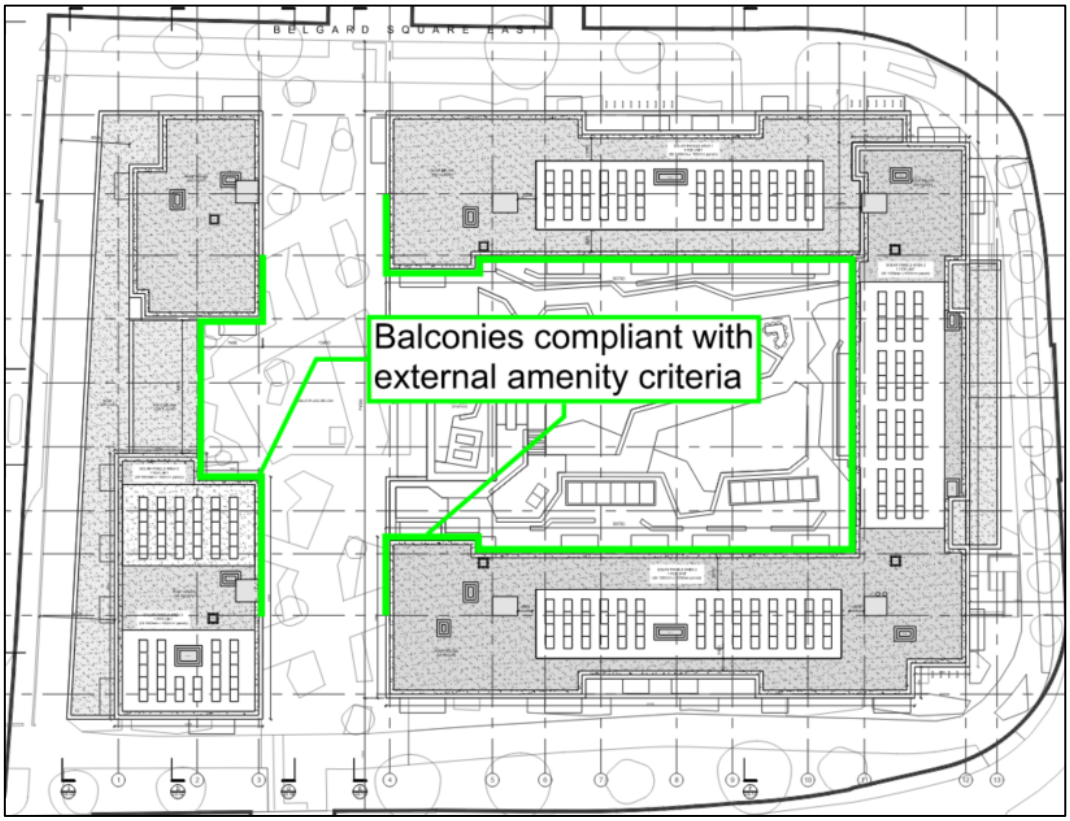


Figure 17: Balconies within the external amenity criteria.

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 in line with the guidance set out in ProPG. Based on this the development is in general compliance 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.

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 winder planning objectives have been adhered to by following the ProPG guidance.

6.5 Stage 2 Assessment Conclusion

The stage 2 assessment considers all four (4) elements, the principles 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 has considered the noise impact on the development and the external amenity spaces. The appropriate provision of external amenity space has been provided through the use of balconies, roof terraces and the ground level public open space in line with the ProPG guidance.

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

6.6 Section 32D Opinion

The Planning Authority have issued a Section 32D Opinion document which details various concerns and points to address from various disciplines. This section outlines the points in relation to acoustics and noise control and demonstrates how the points raised have been incorporated into the final assessment and report.

Operational Noise from Drive Thru and Encompassing Development

The Planning Authority requested that additional unattended noise measurements be conducted at the boundary of the development lands and the existing McDonald's Drive Thru. The purpose of these measurements is to categorise the potential noise impact risk on the development boundary and assess the break in noise from the Drive Thru operations on the dwellings located at the boundary. Additionally, the measurements will be used to assess the external amenity noise levels to assess for compliance with guidance outlined by ProPG documentation.

Based on the measured daytime noise levels at the boundary of the development, the observed measurements can be majority attributed to road traffic levels on the existing road network that surrounds the development lands. While there are contributions from the Drive Thru and other sources such as deliveries and plant and equipment, these are not constant and typically of short duration, as outlined in Section 5.2.1 above which details an attended survey to capture sound exposure levels of the Drive Thru in operation. With the measured noise levels on the southern boundary of the development lands, the noise model was recalibrated using all of the measurement data and noise contour maps were generated to aid in assessing the predicted façade noise levels to determine suitable building envelope performance requirements to ensure compliance with internal noise level criteria outlined in this report. It should be noted that even with the drive thru noise the noise climate is dominated by road traffic noise.

Operational Noise Assessment

The Planning Authority requested that the Acoustic Design Statement takes into account the proposed opening hours of the non-residential uses within the scheme, particularly those of the bar, cafés, creche, etc and identifies any mitigation measures necessary to support these hours.

Based on this request, a detailed operational noise impact assessment has been developed and included in this report. The assessment is outlined in Section 7.

7 Noise Impact Assessment

This section outlines the operational noise assessment on the various non-residential elements of the proposed development. The assessment assumes operational hours in line with similar developments in the area.

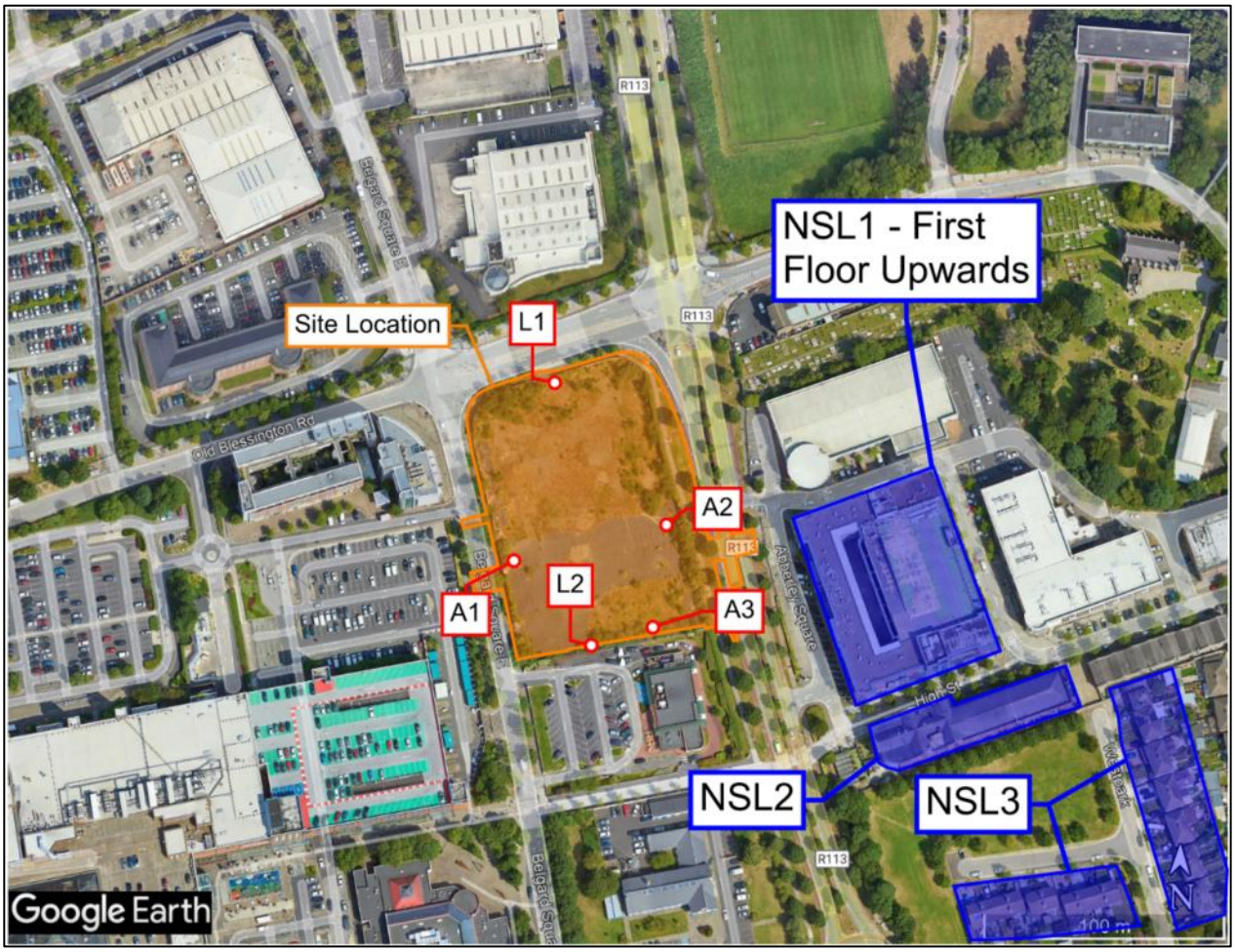


Figure 18: Site Location, Measurement Locations, and Noise Sensitive Locations.

Following the survey a 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 acoustic model has been developed based on the noise survey, the proposed development location and predicted noise sources. As the development has potential to create noise impact at both day and nighttime periods, a worst-case scenario has been developed for each predicting the noise impact at the nearest noise sensitive locations.

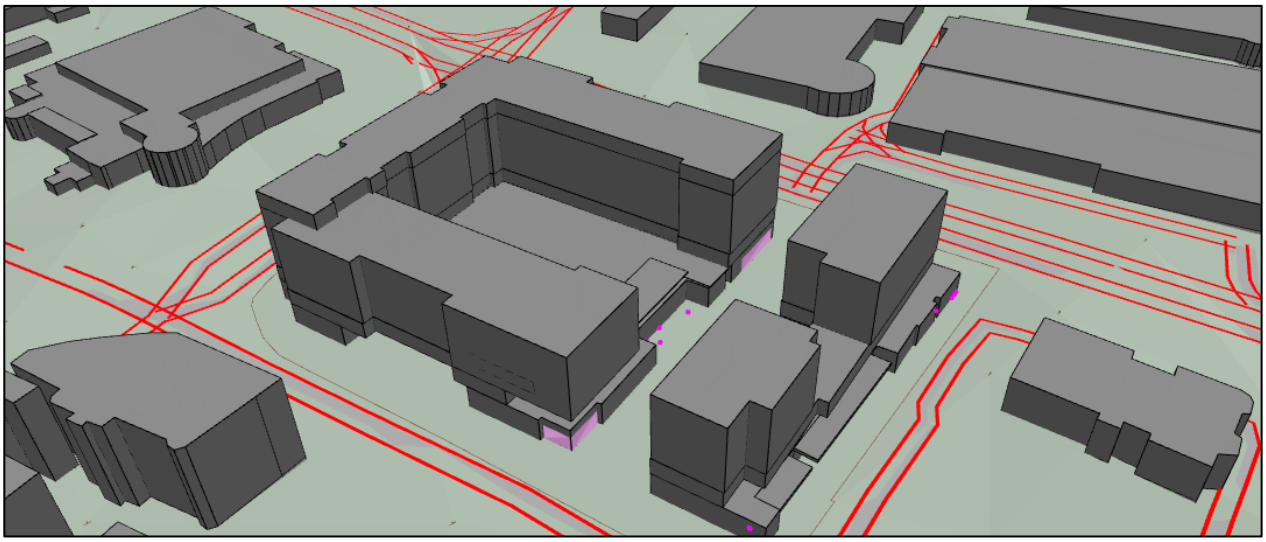


Figure 19: Screenshot from the noise mode outlining the operational noise assessment.

7.1.1 Model Inputs

Plant & Equipment

Plant and equipment specifications are not currently available at this stage of the planning process. As there is no plant and equipment available to conduct a robust noise impact assessment on the sensitive locations in the area, WDA have specified noise limits for any proposed plant and equipment to achieve adequate noise levels at the sensitive receptors that are in the locality of the development lands along with limits to protect the future residents of the development from excessive internal and external noise levels.

Table 9: Plant Sound Power Spectra.

Item	Octave Band Sound Power Level L_W dB at Centre Frequency (Hz)								Overall Sound Power Level L_{WA} dB
	63	125	250	500	1000	2000	4000	8000	
Air Conditioning	63	63	62	61	60	59	58	57	66
Heat Pump	64	64	63	62	61	60	59	58	67
Bin Store Outlet	109	95	91	78	68	61	55	53	87
Bin Store Breakout	98	89	87	73	65	59	50	51	81
Kitchen Extract Outlet	80 [1]	80	81	83	83	81	76	68	89
Kitchen Extract Breakout	65 [1]	65	66	64	64	64	60	54	72

1) Assumed values for 63 Hz, as not provided in manufacturer datasheet.

Creche Breakout Noise

Assumed internal noise levels from typical noise within creches is outlined in Table 10. This spectrum has been used to calculate the noise breakout at the noise sensitive locations (NSLs). The spectrum is based on previously measured internal creche noise levels. The breakout noise levels from the creche have been assessed and implemented into the noise model to predict the noise impact on the surrounding residential dwellings. Table 11 outlines the external creche play area noise levels in sound power format.

Table 10: Assumed internal noise levels within the creche.

Description	Source Sound Pressure Level L_p (dB) at Octave Band Centre Frequency, Hz							Overall Sound Pressure Level L_p (dBA)
	125	250	500	1000	2000	4000	8000	
Assumed Internal Creche Noise	50	56	64	69	70	64	53	74

1) Sound pressure spectrum converted to sound power and breakout noise through the glazing of the creche space at ground level.

Table 11: Measured sound power levels of creche play area.

Description	Source Sound Power Level L_W (dB) at Octave Band Centre Frequency, Hz								L_W (dBA)
	63	125	250	500	1000	2000	4000	8000	
Measured play area noise levels	82	78	76	77	75	73	66	56	80

Bar Breakout Noise

There is proposed bar space located at ground floor level in the southern courtyard between the apartment blocks. There is potential for noise breakout from the bar space to affect the sensitive receptors located on the other side of the courtyard. Breakout noise from typical bar functions have been assessed through a standard double-glazed window and factored into the noise model along with noise measurements taken from WDA library of an active bar featuring a band and patrons has been incorporated into the assessment, and breakout assessed through a standard double-glazed window.

The breakout sound power levels for the restaurant and the bar have been outlined below in Table 12, the assessment assumes a sound insulation performance of 56 dB R_W for the wall and standard double glazing for the windows as detailed in Section 6.2.3. Figure 20 below details the locations of the proposed bar area at ground level of the development.

Music noise levels within the bar should not be raised to a level where they can cause noise nuisance for the residents of the development and this should be confirmed at design development stage of the project.

Table 12: Bar breakout noise in sound power format.

Description	Octave Band Sound Power Level L_W dB at Centre Frequency (Hz)								Overall Sound Power Level L_W (dBA)
	63	125	250	500	1000	2000	4000	8000	
Bar – Patron and Music Breakout Noise	57	72	70	64	52	46	52	45	66

Figure 20: Proposed bar area at ground level.

Operational Hours

This section outlines the proposed operational hours for the various commercial units located at ground floor level of the proposed development. Table 13 outlines the operational hours of each unit type.

Table 13: Operational hours of commercial units.

Unit	Use	Floor Area (sq m)	Hours of Operation
1	Dentist	72	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
2	Medical	210	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
3	Bicycle Repair and Sales	81	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
4	Class 1 / Class 2 Commercial	64	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
5	Off Licence	64	Monday – Thursday 10.00 to 00.00, Friday / Saturday 10.00 to 01.00 and Sunday 12.00 to 00.00
6	Retail	71	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
7	Bar	151	Monday to Friday 10.00 to 00.30 and Saturday / Sunday 10.30 to 01.30
8	Class 1 / Class 2 Commercial	101	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
9	Café	87	Monday – Sunday 8.00 to 00.00
10	Class 1 / Class 2 Commercial	89	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
11	Crèche	350	Monday – Friday 7.00 to 19.00 and Saturday 8.00 to 14.00
12	Pharmacy	195	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
13	Beauty/Health Salon	195	Monday – Friday 8.00 to 21.00 and Saturday / Sunday 9.00 to 18.00

Unit	Use	Floor Area (sq m)	Hours of Operation
14	Retail	134	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
15	Class 1 / Class 2 Commercial	133	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
16	Retail	57	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00
17	Retail	69	Monday – Friday 8.00 to 20.00 and Saturday / Sunday 9.00 to 17.00

External Amenity Space

The external amenity space located at ground level and first floor level has been assess based on guidance outlined in AAAC: Licensed Premises Noise Assessment Technical Guidelines. The documentation outlines various spectra for persons vocal range which has been adopted and used in the assessment. Table 14 outlines the sound power value used to assess the noise from the external amenity spaces in the proposed development. For the purposes of this assessment the external amenity spaces are assumed to be operational from the hours of 16:00hrs - 01:00hrs.

Table 14: Patron Sound Power Levels.

Description	Source Sound Power Level L_w (dB) at Octave Band Centre Frequency, Hz								L_{wA} (dB)
	63	125	250	500	1000	2000	4000	8000	
Male Normal Vocal	54	55	64	66	60	56	52	47	66

7.2 Daytime Scenario

The noise impact at the nearest noise sensitive locations (NSL1 – NSL3) have been assessed in accordance with BS 4142. NSL1 has been selected to be outlined in the BS4142 assessment as this NSL has the highest predicted noise level from the proposed development. All other NSL's are predicted to have lower onset noise levels from the development and therefore NSL1 is the worst-case during daytime hours.

The daytime situation assumes the following noise sources:

- 2no. Heat pumps operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 35no. air conditioning units throughout the development operating 100% of the time capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 10no. bin store fans operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 7no. kitchen fans operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- Breakout noise from the creche based on sound power spectra outlined in Table 10 and operational hours outlined in Table 13.
- Breakout noise from the bar based on sound power spectra outlined in Table 12 and operational hours outlined in Table 13.
- Café external seating assumes 24 persons occupying the external seating space based on hours outlined in Table 13.
- 24 persons occupying the external amenity space at first floor level, speaking with normal voices as outlined in Table 14 between the hours of 16:00hrs – 23:00hrs.
- 18 persons occupying the external amenity space at first floor level, speaking with normal voices as outlined in Table 14 between the hours of 16:00hrs – 23:00hrs.

Table 15: BS4142 Assessment for daytime period.

Results		Relevant BS 4142 Clause	Commentary
Predicted specific sound level (daytime)	$L_{Aeq(15min)}$ = 38dB	7.3.6	As the proposed development is not yet existing, the noise levels have been predicted using SoundPlan modelling software. Worst case specific sound predicted at NSL1 as this is closest to the proposed development.
Residual sound level (daytime)	$L_{Aeq(1,hour)}$ = 60dB	7.3.2	The residual sound level was dominated by road traffic noise. Measurement location A2 assessed as this is representative of background noise for worst case receptor (NSL1).
Background sound level (daytime)	$L_{A90(1,hour)}$ = 55dB	8.1.2 8.4	The L_{A90} sound level was taken from the attended survey results and calculated at the NSL locations.
Specific sound level as predicted	$L_{Aeq(15min)}$ = 38dB	7.3.6	The specific sound has been predicted by calculation alone as the proposed development is not yet existing.
Acoustic feature correction	+0dB	9.2 9.3.2	It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics.
Rating level	(38 + 0) dB = 38dB	9.2	
Background sound level	$L_{A90(1,hour)}$ = 55dB	8	
Excess of rating over background sound level	(38 - 55) dB = -17dB	11	Assessment indicates that no adverse impact is likely on the noise sensitive locations as the specific sound is 17dB lower than the background levels and is lower than the residual sound. Context has also been considered.
Uncertainty of the assessment	Not significant	10	The specific sound is a worst-case prediction as the assessment assumes the worst-case use of the noise sources listed in Section 7.1.1 above.

Based on the review of the noise sources and the BS 4142 assessment it is predicted that the noise emanating from the proposed heat pumps will likely not have an adverse impact during the daytime period.

Tonality and Impulsivity

Based on the predicted noise emissions from the proposed development, there is no likelihood that tonality and impulsivity will have an adverse impact on the surrounding sensitive locations located to the east of the development. The predicted noise levels are lower than the background noise and residual noise levels measured in the surrounding area.

NG4

NG4 recommends a daytime criterion of (07:00hrs – 19:00hrs) 55dB $L_{Ar,,T}$, the predicted noise emissions from the proposed development are 38 dBA Leq, with no tonality or impulsivity, therefore the NG4 criteria is expected to be achieved.

Table 16: Model results for each NSL during the daytime period.

NSL	Distance from centre of the site to NSL (m)	Criteria (07:00hrs – 19:00hrs) EPA NG4 ($L_{Ar,T}$ dB)	Predicted Noise Level ($L_{Ar,T}$ dB)	Compliance
NSL1	90	55	38	Compliant
NSL2	145	55	33	Compliant
NSL3	220	55	28	Compliant

Evening Time Situation

Based on the predicted results at the sensitive receptor for the daytime period, compliance with the evening time criteria of (19:00hrs-23:00hrs) 50 dB $L_{Aeq,T}$ is achieved based on the predicted noise emissions from the development in operation are 38 dB(A) at the most exposed sensitive receptor.

7.3 Night-time Scenario

The noise impact at the nearest noise sensitive locations (NSL1 – NSL3) have been assessed in accordance with BS 4142. NSL1 has been selected to be outlined in the BS4142 assessment as this NSL has the highest predicted noise level from the proposed development. All other NSL's are predicted to have lower onset noise levels from the development and therefore NSL1 is the worst-case during nighttime hours.

The nighttime situation assumes the following noise sources:

- 2no. Heat pumps operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 35no. air conditioning units throughout the development operating 100% of the time capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 10no. bin store fans operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- 7no. kitchen fans operating at 100% capacity based on sound power spectra outlined in Table 9 and operational hours outlined in Table 13.
- Breakout noise from the creche based on sound power spectra outlined in Table 10 and operational hours outlined in Table 13.
- Breakout noise from the bar based on sound power spectra outlined in Table 12 and operational hours outlined in Table 13.
- Café external seating assumes 24 persons occupying the external seating space based on hours outlined in Table 13.
- 24 persons occupying the external amenity space at first floor level, speaking with normal voices as outlined in Table 14 between the hours of 23:00hrs – 01:00hrs.
- 18 persons occupying the external amenity space at first floor level, speaking with normal voices as outlined in Table 14 between the hours of 23:00hrs – 01:00hrs.

7.3.1 BS4142 Nighttime Assessment

The noise impact at the nearest noise sensitive location (NSL2) has been assessed in accordance with BS4142.

Table 17: BS4142 Assessment for nighttime period.

Results		Relevant BS 4142 Clause	Commentary
Predicted specific sound level (nighttime)	$L_{Aeq(15min)}$ = 32dB	7.3.6	As the proposed development is not yet existing, the noise levels have been predicted using SoundPlan modelling software. Worst case specific sound predicted at NSL1 as this is closest to the proposed development.

Results		Relevant BS 4142 Clause	Commentary
Residual sound level (nighttime)	$L_{Aeq(15,min)}$ = 50dB	7.3.2	The residual sound level was dominated by road traffic noise. Measurement location L1 assessed as this is representative of background noise for worst case receptor (NSL1).
Background sound level (nighttime)	$L_{A90(15, min)}$ = 44dB	8.1.2 8.4	The L_{A90} sound level was taken from the attended survey results and calculated at the NSL locations.
Specific sound level as predicted	$L_{Aeq(15min)}$ = 32dB	7.3.6	The specific sound has been predicted by calculation alone as the proposed development is not yet existing.
Acoustic feature correction	+0dB	9.2 9.3.2	It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics.
Rating level	(32 + 0) dB = 32dB	9.2	
Background sound level	$L_{A90(15, min)}$ = 44dB	8	
Excess of rating over background sound level	(32 - 44) dB = -12dB	11	Assessment indicates that no adverse impact is likely on the noise sensitive locations as the specific sound is 12dB lower than the background levels and is lower than the residual sound. Context has also been considered.
Uncertainty of the assessment	Not significant	10	The specific sound is a worst-case prediction as the assessment assumes the worst-case use of the noise sources listed in Section 7.1.1 above.

Based on the review of the noise sources and the BS 4142 assessment it is predicted that the noise emanating from the proposed heat pumps will likely not have an adverse impact.

Tonality and Impulsivity

Based on the predicted noise emissions from the proposed development, there is no likelihood that tonality and impulsivity will have an adverse impact on the surrounding sensitive locations located to the east of the development. The predicted noise levels are lower than the background noise and residual noise levels measured in the surrounding area.

NG4

NG4 recommends a nighttime criteria of 45 dB $L_{Aeq,T}$, the predicted noise levels from the mechanical plant noise are 32 dBA, with no tonality or impulsivity, therefore the NG4 criteria is expected to be achieved.

Table 18: Model results for each NSL during the nighttime period.

NSL	Distance from centre of the site to NSL (m)	Criteria (23:00hrs – 07:00hrs) EPA NG4 ($L_{Aeq,T}$ dB)	Result (L_{Aeq} dB)	Compliance
NSL1	90	45	32	Compliant
NSL2	145	45	31	Compliant
NSL3	220	45	25	Compliant

7.4 Assessment on Proposed Development

The operational noise impact assessment includes an assessment conducted on the residential dwellings that form part of the proposed development. The assessment includes the noise impact from the commercial units and associated plant and equipment as well as any patron noise associated with the bar and café units along with the external amenity spaces. Based on the predicted noise levels and the building envelope performance designed for the development as outlined in Section 6.2.3 (with the windows in the closed position), internal noise levels in apartments located above the commercial units remain within criteria. Additionally, operational noise levels are below background and residual noise levels measured in the area during the baseline noise surveys. Table 19 outlines the predicted noise levels on the façade of the most exposed apartment at first floor level to operational noise from commercial developments at ground floor level. Figure 21 details a markup of the façades in Table 19. Based on the façade noise levels the noise impact on the residential dwellings in the development are compliant with internal noise levels for both daytime and nighttime criteria.

Table 19: Façade Noise Level Assessment.

Location	Predicted Noise Level dB(A) L_{eq}	Internal Noise Level dB(A) L_{eq}	Compliant with BS 8233:2014 Day/Night
F1	46	19	Compliant
F2	48	21	Compliant
F3	46	19	Compliant
F4	42	9	Compliant
F5	41	8	Compliant
F6	45	12	Compliant

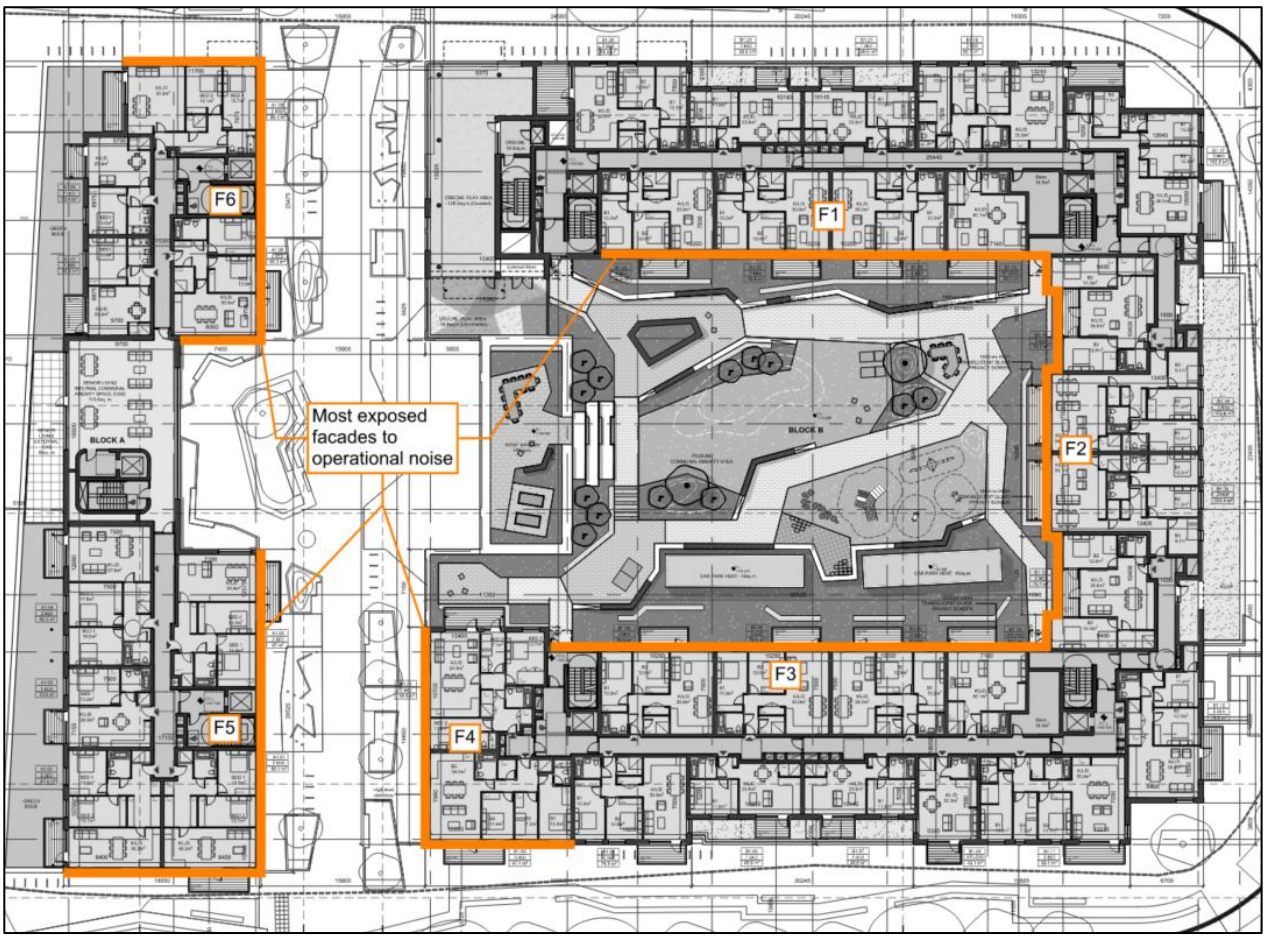


Figure 21: Facades Most Exposed to Operational Noise.

7.5 Modelling Assumptions

The following assumptions were made throughout the modelling and assessment:

- Assessment based on the noise measurements undertaken on the 30th of September 2024 to the 3rd of October 2024 and the 19th to the 24th of June 2025.
- Noise source data for the assessment was based on data provided to WDA by the design team such as plant noise specification and operational hours of commercial units.
- Model assumes a worst-case operating scenario as outlined in Section 7 above.
- Modelling based on the drawings, layouts and information provided.
- Assessment based on proposed development only.

8 Conclusion

Wave Dynamics were engaged by Midsal Homes 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 Belgard Square, Belgard Road, Tallaght, Dublin 24.

The development will consist of the following:

Midsal Homes Limited intends to apply for permission for a Large-Scale Residential Development (LRD) at a site of approximately 1.19 Ha at Belgard Square East, Belgard Road and Old Blessington Road, Tallaght, Dublin 24. The main development site (approximately 0.91 Ha) is generally bound: to the north by Old Blessington Road; to the east by Belgard Road (R113); to the south by McDonald's Restaurant property (D24 HW74); and to the west by Belgard Square East. The site also includes parts of the carriageways and verges of Belgard Square East, Belgard Road and Old Blessington Road (approximately 0.28 Ha) for the provision of landscaping, 2 No. pedestrian crossings, accesses/junctions, minor road and footpath works, cycle infrastructure and water services infrastructure.

The proposed development principally comprises: the demolition and removal of existing boundary walls and railings on the main development site's eastern, western and northern sides; and the construction of a mixed-use development in 2 No. blocks (Block A to the south and Block B to the north) with a gross floor area of 23,540 sq m (excluding basement of 275 sq m) and ranging in height from 1 No. to 7 No. storeys (with mezzanine level) over basement.

The development includes a total of 199 No. residential dwellings (6 No. studios, 47 No. 1-bed, 98 No. 2-bed and 48 No. 3-bed) in the 2 No. blocks, with Block A comprising 49 No. 'senior living' apartment units and Block B comprising 150 No. 'standard' apartment units. The development also includes 2,123 sq m of non-residential floor space, with the following uses proposed: 4 No. retail units (totalling 331 sq m); 4 No. class 1 / class 2 commercial units (totalling 387 sq m); a bicycle sales and repair shop (81 sq m); an off-licence (64 sq m); a bar (151 sq m); a café (87 sq m); a medical centre (210 sq m); a dental practice (72 sq m); a pharmacy (195 sq m); a beauty/health salon (195 sq m); and a crèche (350 sq m) with external play area.

The development also comprises: an undercroft car park accessed via a new entrance/exit at Belgard Square East which provides 58 No. car parking spaces; a gated service lane to the south of Block A, with entrances/exits off Belgard Square East and Belgard Road; 2 No. pedestrian/cycle crossings, at Belgard Square East and Belgard Road; continuation of the northbound cycle lane from Belgard Road onto Old Blessington Road; alteration to the median and northbound right turn at Belgard Road onto Abberley Square; cycle parking; internal communal amenity spaces for the senior living units; hard and soft landscaping, including public open space, communal amenity space and incidental spaces; private amenity spaces (as balconies and terraces facing all directions); boundary treatments; 2 No. sub-stations; plant/operational rooms; bin stores; public lighting; blue roofs; rooftop PV arrays; lift overruns and rooftop opening vents atop both blocks; 4 No. 0.3 m diameter microwave link dishes mounted on 2 No. steel support poles affixed to the Block B lift overrun, all enclosed in radio-friendly GRP shrouds; 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 Belgard Road and the Old Blessington Road which dominate the noise levels in the area. 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 road noise impact 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 low risk across the entirety of the site.

Consideration has also been given to the fact that the site lies 5km from the edge of the Casement Aerodrome runway. The noise measurements were undertaken during peak road traffic times.

Break-in noise calculations to predict the internal noise levels from road traffic and operational noise from the adjacent McDonald's Drive Thru 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, roof and ventilation requirements.

External Amenity Noise Levels

The external amenity spaces on the development include balconies on the apartments, public plaza space at ground level and podium communal amenity spaces at first floor level. Appropriate amenity has been provided on the development for residents using a combination of the balconies on suitable facades, public plaza space at ground level and podium communal amenity spaces at first floor level. This is in line with element 3(v) of ProPG.

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.

Operational Noise Impact Assessment

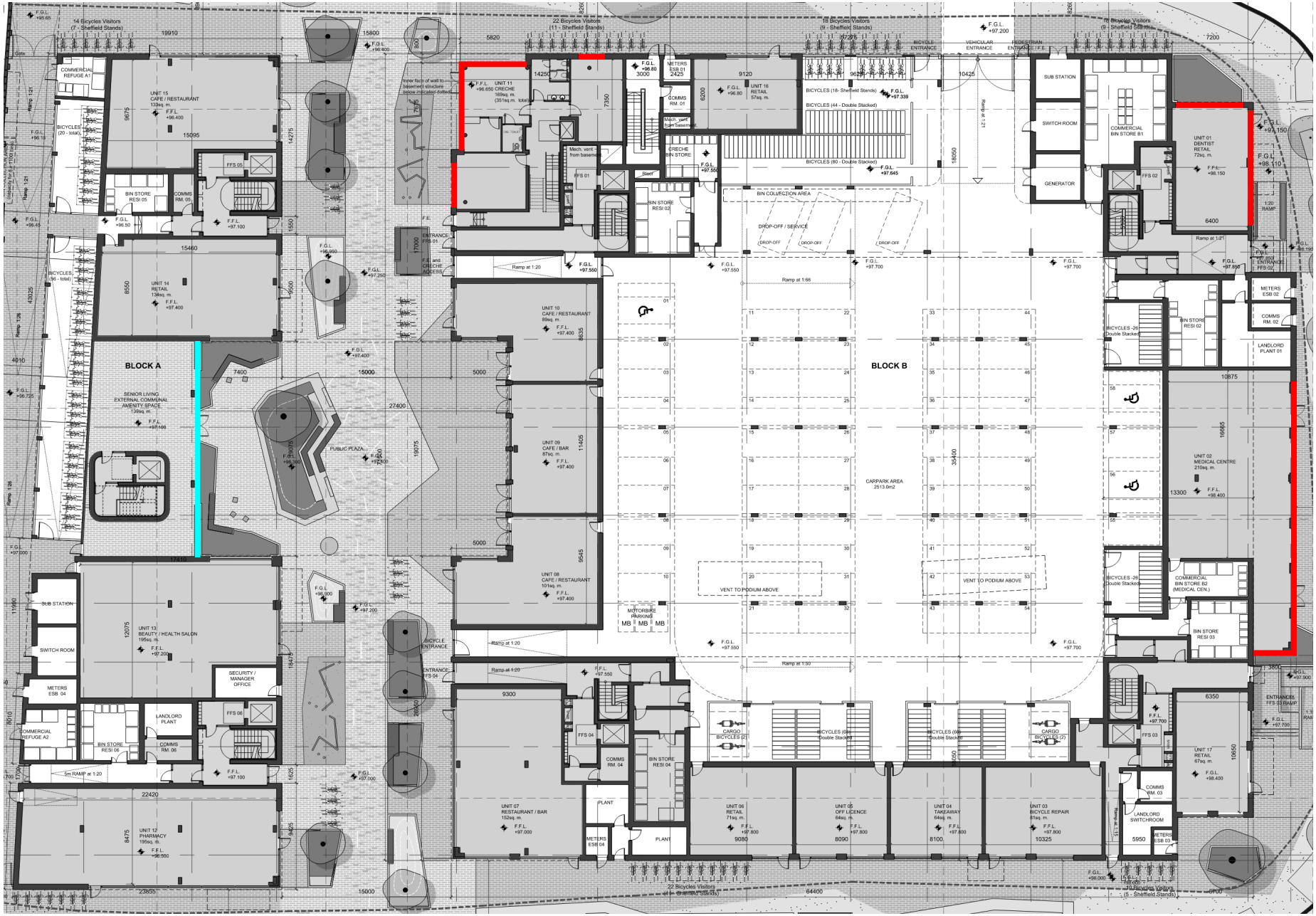
An operational noise impact assessment has been conducted to assess noise generated from the operation of plant and equipment and the various commercial units located on the ground floor of the proposed development such as a bar, café, creche, various retail units, class 1/class 2 commercial units, pharmacy, beauty/health salon, off licence, bicycle repair shop, medical centre, and a dentist. It is predicted that operational noise from the proposed development will not cause a negative noise impact on the nearby noise sensitive locations during both daytime and nighttime operations The mechanical plant and equipment specification is not available at this stage of the project.

Based on the assessment outlined in this report it is predicted that noise generated by the proposed development will achieve project criteria.

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 µPa).
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, Leq (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 Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

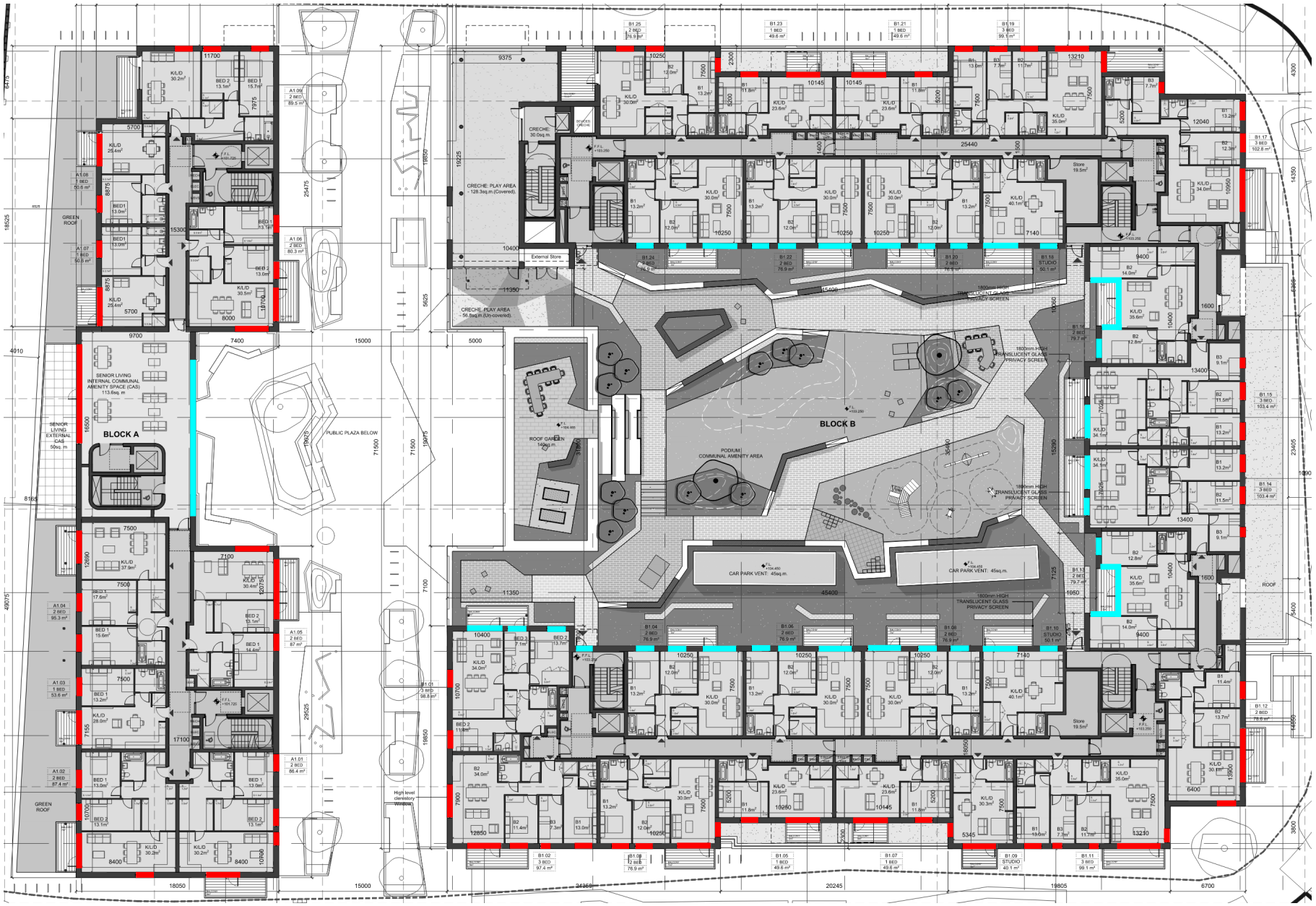
Project:	Belgard Square, Dublin
Title:	Facade Markup - Ground Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Mezzanine Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

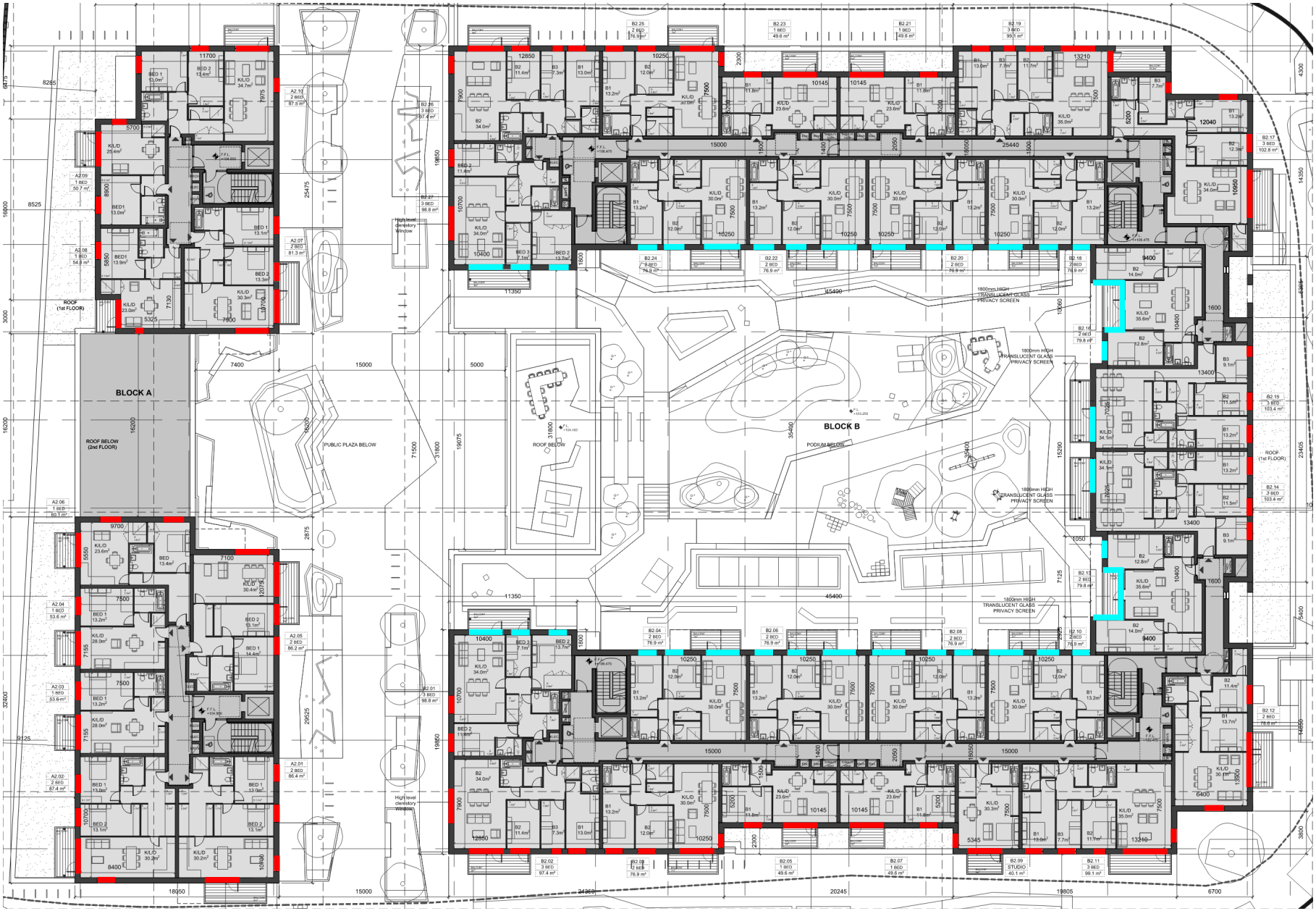


Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - First Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

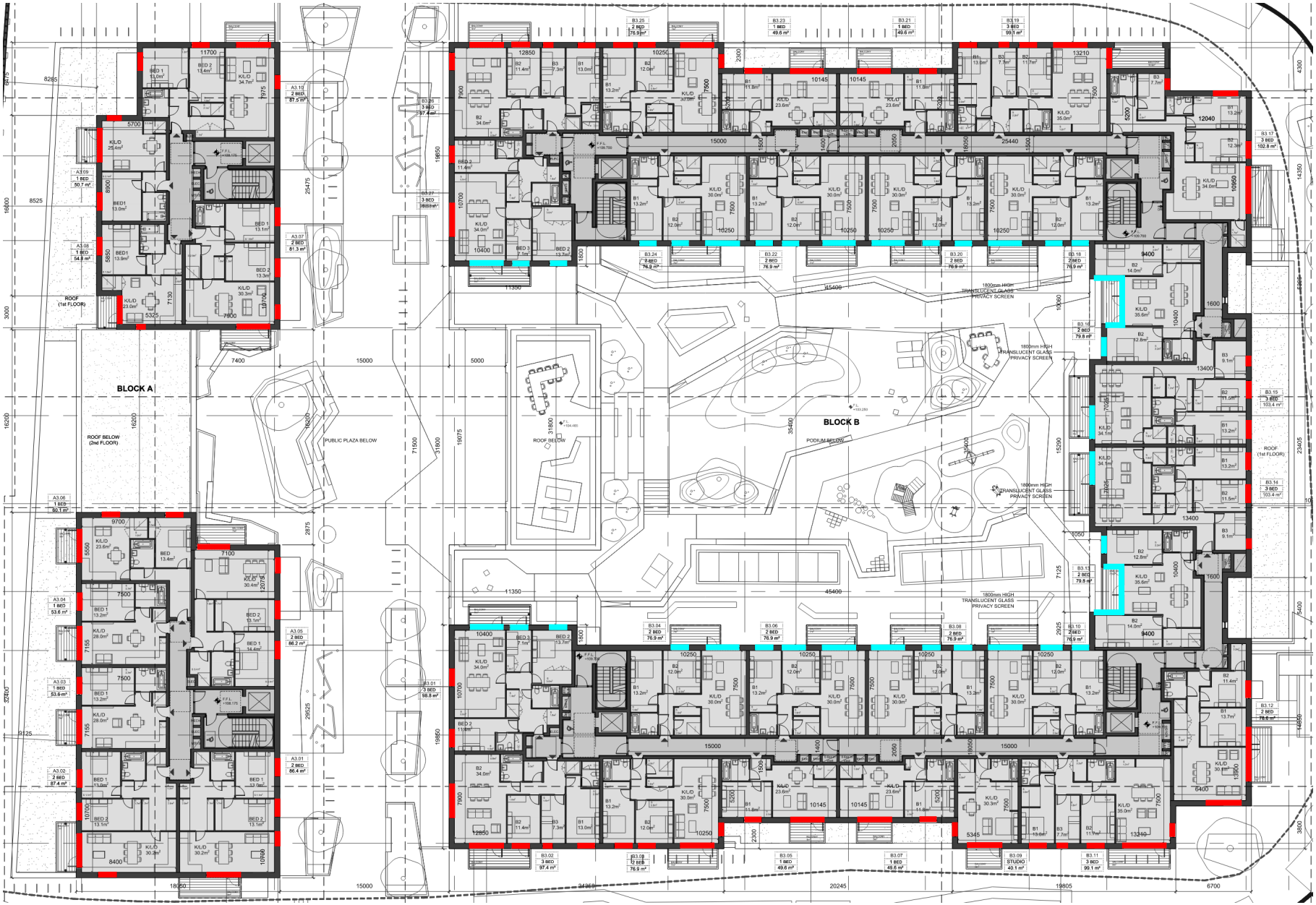


Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Second Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

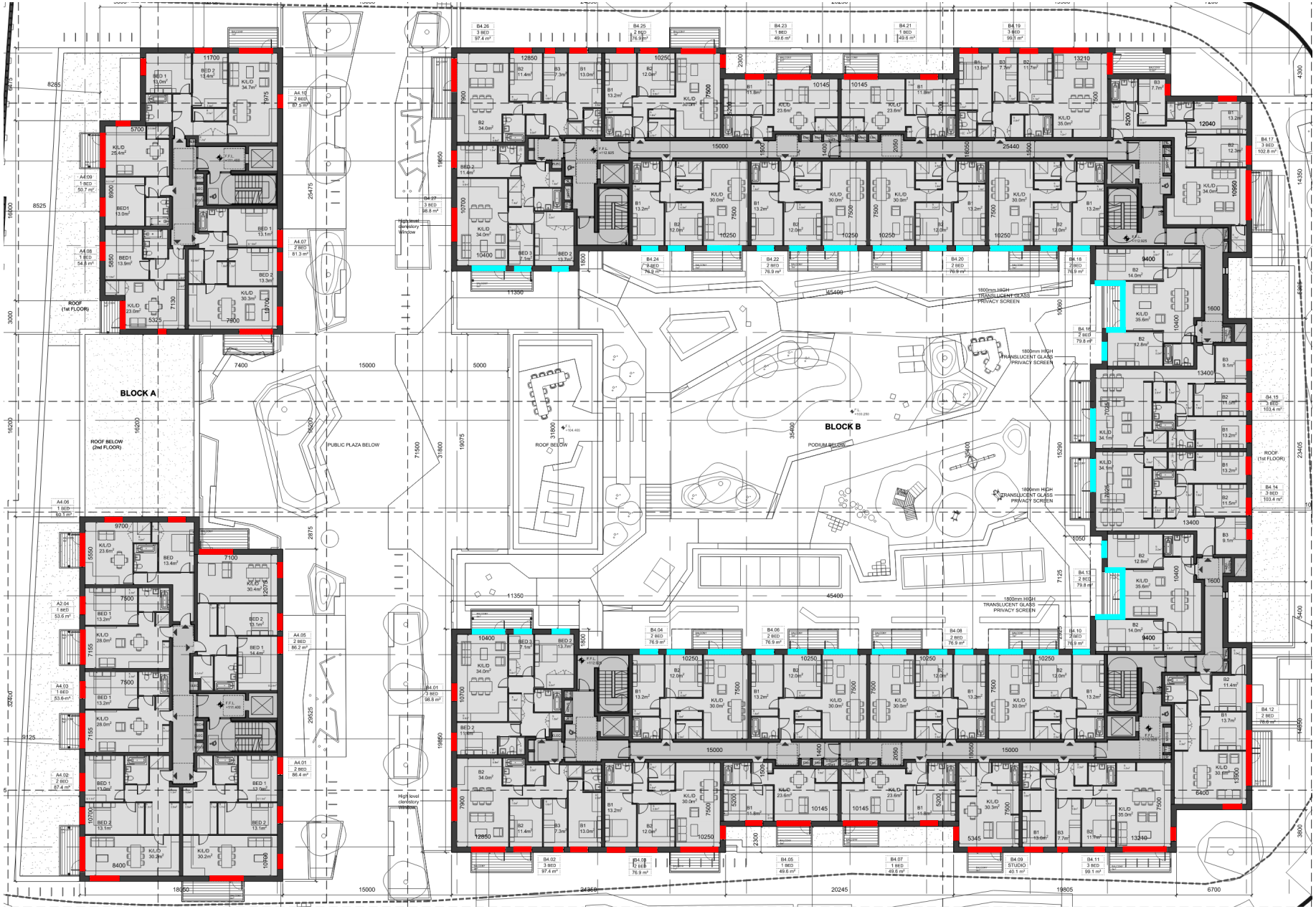


Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Third Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

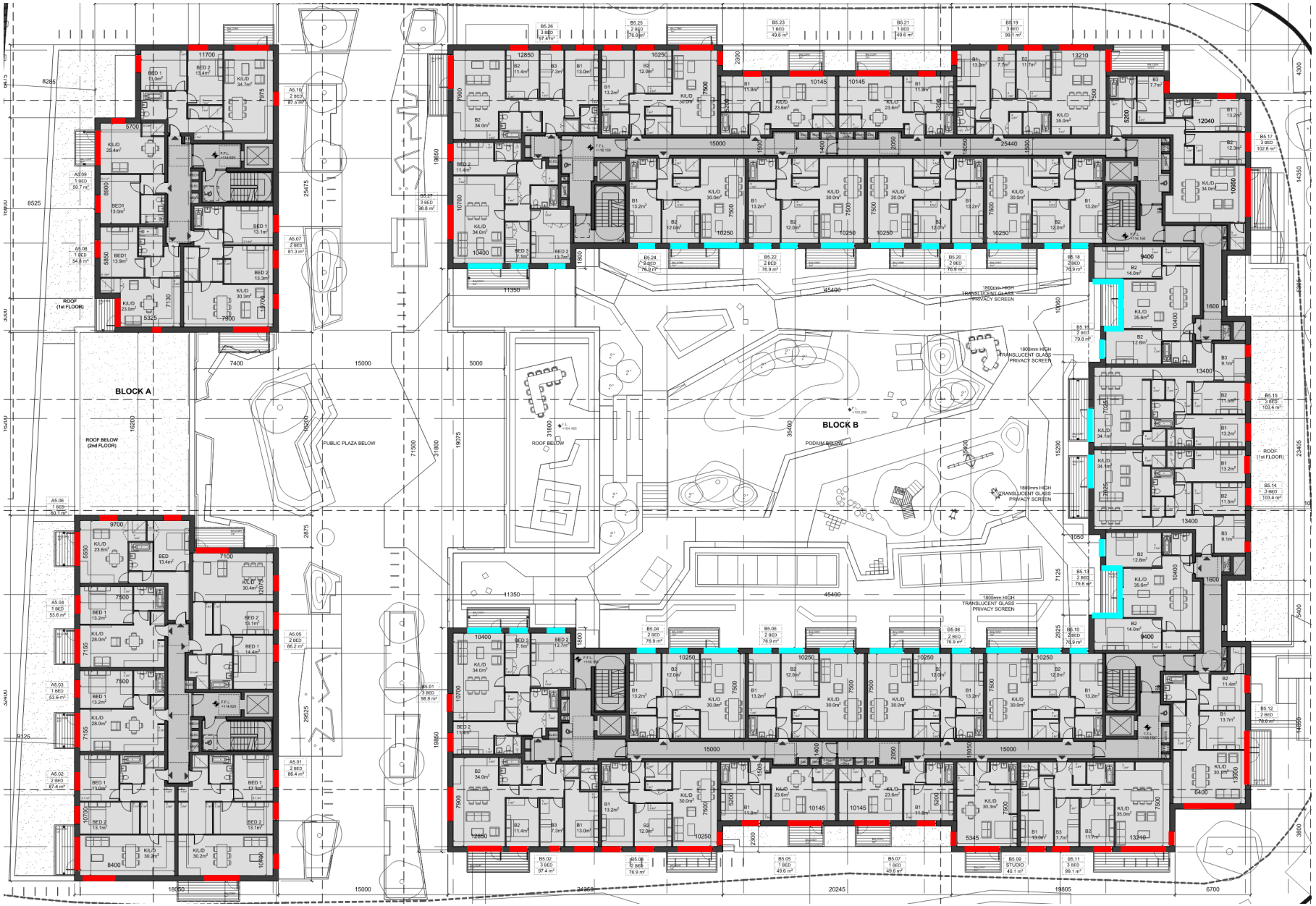


Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Fourth Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025

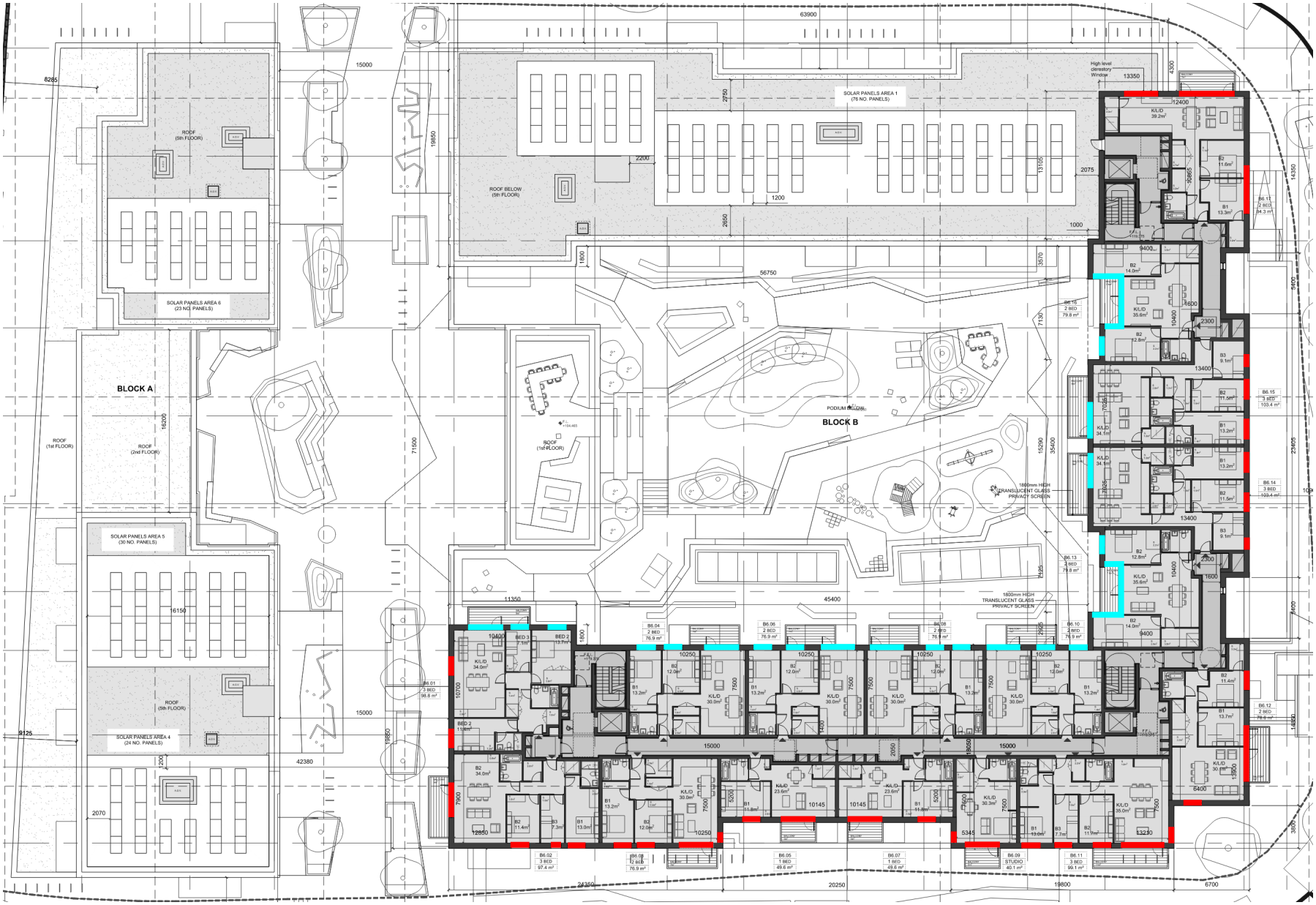


Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Fifth Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025



Glazed Elements Specification

- 29 dB R_w
- 33 dB R_w

WAVE DYNAMICS
ACOUSTIC CONSULTANTS
DUBLIN WEXFORD CORK LONDON

Project:	Belgard Square, Dublin
Title:	Facade Markup - Sixth Level
Prepared By:	Joe Potter
Reviewed By:	Cathal Reck
Date:	30/10/2025