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THE ARBOURY
BELGARD ROAD

ENVIRONMENTAL NOISE STRATEGY DOCUMENT

Technical Report Prepared For

Landmarque Belgard Development Company Limited

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1.0 INTRODUCTION

The following report outlines a high level review of potential noise and vibration impacts associated with the proposed development. Best practice guidance in respect of noise and vibration as may be pertinent to the proposed development during the construction and operational phases has also been discussed.

The potential noise and vibration impact of the proposed development on the surroundings must be considered for two distinct stages:

- Construction phase; and,
- Operational phase.

The construction phase will involve demolition of the existing structures, excavation over the development site, including the formation of the basement levels and the construction of the new buildings.

During the operational phase of the developments the following sources of outward noise associated with the development would be deemed to be long term:

- Building services noise; and,
- Additional vehicular traffic on public roads.

In this instance, there is potential for road traffic noise intrusion from the Belgard Road to impact on the proposed residential dwellings.

2.0 PLANNING FRAMEWORK FOR NOISE

It is important to provide some context as to how the issue of noise is addressed in Local Authority planning policy. The following sections outline key noise related elements of the South Dublin County Council Development Plan (2016 – 2022) and the Dublin Agglomeration Noise Action Plan Volume 4 – South Dublin County Council (2018 – 2023).

2.1 South Dublin County Council Development Plan (2016 – 2022)

The South Dublin County Council Development Plan (2016 – 2022) outlines the following objectives in respect of environmental noise:

IE7 Objective 1: *To implement the provisions of EU and National legislation on air, light and noise control and other relevant legislative requirements, as appropriate, in conjunction with all relevant stakeholders.*

IE7 Objective 3: *To implement the relevant spatial planning recommendations and actions of the Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018.*

IE7 Objective 4: *To ensure that future developments are designed and constructed to minimise noise disturbance and take into account the multi-functional uses of streets including movement and recreation as detailed in the Urban Design Manual (2009) and the Design Manual for Urban Roads and Streets (2013).*

Section 11.6.3 of the Plan provides the following guidance in relation to Environmental Hazard Management of noise:

(ii) Noise *The Planning Authority will have regard to the Dublin Agglomeration Environmental Noise Action Plan 2013 – 2018, Dublin Local Authorities (2013) when assessing development proposals along major road and rail transport corridors, with a view to reducing noise from new sources and to identify and protect areas of low sound levels.*

Development proposals with the potential to give rise to significant noise impacts may require a Noise Impact Assessment and mitigation plan to minimise noise disturbances and protect the amenities of the area.

The Planning Authority will carefully consider the location of noise sensitive developments so as to ensure they are protected from major noise sources where practical. Furthermore, the provision of appropriate mitigation measures for existing areas adjacent to major noise sources is supported and will be considered having regard to the visual amenity and the proper planning and sustainable development of the area.

Where development sites adjoin residential properties, the Planning Authority will generally attach a condition to grants of planning permission restricting the operation of equipment or machinery (to include pneumatic drills, construction vehicles, generators, etc.) on or adjacent to the site before 7.00 hours on weekdays and 9.00 hours on Saturdays, after 19.00 hours on weekdays and 13.00 hours on Saturdays and at any time on Sundays, Bank Holidays or Public Holidays.

2.2 Dublin Agglomeration Noise Action Plan (2018 – 2023)

The *Dublin Agglomeration Environmental Noise Action Plan December 2018 – July 2023 Volume 4 – South Dublin County Council* (NAP) states the following regarding how noise should be dealt with in the planning system for new noise-sensitive developments, from section 8.2.3:

> *"In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA has suggested that in the interim that Action Planning Authorities should examine the planning policy guidance notes issued in England titled, 'ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise'. This has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England."*

In addition to ProPG, the South County Council Noise Action Plan 2018 – 2023 has been published in order to address the requirements of the European Noise Directive 2002/49/EC. This NAP produced noise maps in order to determine the population exposure to undesirably high noise levels and also to identify areas with desirably low noise that should be preserved into the future. The NAP defines the following ranges for these descriptions:

- Undesirably high external noise levels are defined as being above 55 dB L_{night} at night and/or above 70 dB L_{den} over a 24 hour period; and,
- Desirably low external noise levels are defined as being below 50 dB L_{night} at night and/or below 55 dB L_{den} over a 24 hour period.

It is important to note that the NAP does not recommend that residential development be restricted within areas identified as having undesirably high noise levels. Rather it recommended a range of noise mitigation measures be required for new residential developments within these areas.

3.0 POTENTIAL NOISE IMPACT OF THE PROPOSED DEVELOPMENT

3.1 Construction Phase

3.1.1 Construction Noise

There is potential for generation of moderate to significant noise levels during the construction phase. The magnitude of noise generated will be dependent on a number of factors including the proximity of noise sensitive receptors, construction methods employed, the selection of plant and the construction programming. A variety of items of construction methods and plant items will be required during the various phases of the construction project. Noise will be generated primarily from the onsite construction activity however noise can be generated during haulage of construction and waste materials to and from site.

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Noise*. The appointed contractor will be required to limit construction noise levels in accordance with the ABC Method outlined therein.

3.1.2 Construction Vibration

In this instance, given the distance from the site to the nearest noise or vibration sensitive receptors, it is unlikely that construction vibration will generate any moderate or significant impacts.

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385: 1993 - Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration; and,
- British Standard BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites - Vibration.

The appointed contractor will be required to limit construction vibration levels in accordance with BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Vibration.*

3.2 Operational Phase

3.2.1 Noise from Mechanical Services

A range of mechanical plant items will be required to service the development. While the specific details of the plant items would normally be confirmed at the detail design stage of a project, typically for residential and commercial developments, there will be a requirement to provide mechanical plant for ventilation, heating and cooling purposes. Mechanical plant serving these purposes may include air handling units, chillers, condensers, boilers and fans of various types and sizes. Emergency power generators may also be required in certain instances. Whilst there is potential for these plant items to generate moderate to significant noise levels, mitigation at the design stage can effectively eliminate potential noise impacts associated with these plant items.

The best practice method for measuring and assessing building services plant noise emissions is outlined in the British Standard BS4142:2014+A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. BS4142:2014+A1:2019 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

It will be necessary that the cumulative noise levels from all plant associated with the proposed development be specified and designed to ensure that specific plant noise levels do not exceed 10 dB above the prevailing background noise levels at the nearest noise sensitive location. In addition, due care should be taken to ensure that the selected mechanical plant does not generate any potential tonal or impulsive noise.

3.2.2 Additional vehicular traffic on public roads.

The proposed development will give rise to additional road traffic on public roads. Generally additional traffic from residential developments can give rise to slight to moderate impacts depending on prevailing traffic volumes and the additional proposed road traffic.

Further comment can be provided in respect of noise related impacts of additional road traffic once a road traffic survey is completed.

3.3 Inward Impact Assessment

Due to the proximity of proposed dwellings to the Belgard Road, there is potential for intrusive road traffic noise to impact on the residential amenity of the units.

The dwellings will be designed in a manner that considers guidance outlined in the following documents:

- BS 8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings* (BSI); and
- *Dublin Agglomeration Environmental Noise Action Plan December 2018 – July 2023 Volume 4 – South Dublin County Council* (NAP)

In practice, this may include upgrade of façade elements including glazing and ventilation as well as some localised treatment to facades at lower floors.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise — The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

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 ($L_{AF90,T}$).

broadband — Sounds that contain energy distributed across a wide range of frequencies.

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 L_{pA} — 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.

$L_{Aeq,T}$ — This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background. As standard it is measured using the fast time weighting constant of 125ms.

L_{AFN} — The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.

L_{AF90} — Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.

noise — Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.

APPENDIX A (Cont.)
GLOSSARY OF ACOUSTIC TERMINOLOGY

noise sensitive location NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.

sound pressure level The sound pressure level at a point is defined as:

$$Lp = 20Log\frac{P}{P_0} \text{ dB}$$

tonal Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

$^1/_3$ octave analysis Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each.