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Prepared for: Built

22 EDWIN FLACK AVENUE, SYDNEY OLYPIC PARK
SERVICED APARTMENTS DEVELOPMENT

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

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1. INTRODUCTION

This report presents the assessment which has been undertaken by this office into the impact of environmental noise on the acoustic amenity of the proposed serviced apartment's development at 22 Edwin Flack Avenue, Sydney Olympic Park. The predominant noise source which will potentially impact on the proposed development is major events within the surrounding facilities of Sydney Olympic Park.

The assessment has been based on noise levels obtained at the site by this office for major events at locations including Sydney Olympic Park and the SCG. Measured noise levels have been used to predict internal noise levels within the future development, and select appropriate constructions to prevent excessive internal noise levels.

2. SITE DESCRIPTION

The proposed development site is located at 22 Edwin Flack Avenue, Olympic Park. The site is located to the west of Edwin Flack Avenue with ANZ stadium within close proximity. Noise associated with major events held within ANZ Stadium represents the worst case noise levels which will impact the site.

3. NOISE ASSESSMENT

Acoustic objectives for the proposed development are in accordance with the Australian Standard AS2107:2000.

4. ENVIRONMENTAL NOISE ASSESSMENT

4.1 MEASUREMENT NOISE LEVELS

The assessment of noise impact from events within Sydney Olympic Park on the future development has been based on measurements previously conducted by this office of major events including:

1. The NRL Grand Final at ANZ Stadium in 2009
2. Music Concert at the SCG in 2007
3. Sporting Events held at the SCG, 2008

5. ENVIRONMENTAL NOISE ASSESSMENT

Environmental noise constantly varies in level, due to fluctuations in activities being conducted, sound intensity etc. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

5.1 MEASURED NOISE LEVELS

Measured noise levels for various events which this office has been involved with are detailed in the table below. In all cases the measured event and location of the event is detailed. The noise levels detailed below have been used as the basis of the noise impact assessment on the future development proposed at 22 Edwin Flack Avenue, Sydney Olympic Park.

Table 1 – Measured Events Noise Levels

Event	Location	Noise Level $L_{eq\ (15\ min)}$ dB(A)
Sydney Olympic Park – NRL Grand Final 2009	Olympic Boulevard within 100m of stadium	Up to 72
Music Concert at the SCG in 2007	Neighbouring properties on Moore Park Road within close proximity	Up to 73
Sporting Event (AFL Game) held at the SCG, 2008	Neighbouring properties on Moore Park Road within close proximity	Up to 70

5.2 NOISE ASSESSMENT CRITERIA

Recommended internal noise levels for development on major roads are set out below. These levels are consistent with the recommended internal noise levels set out in Australia. New Zealand Standard *AS2107 (Recommended Noise Levels and Reverberation Times for Building Interiors)* are achieved.

Table 1 – Internal Noise Level Criteria – Residential Areas

LOCATION	Required Internal Noise Level	
	dB(A) $L_{eq\ (1hr)}$ (7am – 10pm)	dB(A) $L_{eq\ (1hr)}$ (10pm – 7am)
Bedrooms	45	40
Living rooms	45	N/A

6. EVALUATION OF NOISE INTRUSION

6.1 INTERNAL NOISE LEVELS

Internal noise levels will primarily be as a result of noise transfer through the windows and doors and roof, as these are relatively light building elements that offer less resistance to the transmission of sound. The walls are proposed to be heavy masonry elements that will not require upgrading.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to environmental noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Calculations were performed taking into account the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and the likely room sound absorption characteristics. In this way the likely interior noise levels can be predicted.

In all cases, the selected glazing type (refer below) reduces internal noise levels to within the nominated criteria for the various space types.

6.2 RECOMMENDED GLAZING

The following tables list the recommended glazing assemblies for this project to achieve the internal environmental noise requirements.

The acoustic assessment has been conducted in conjunction with the potentially worst case noise levels and the proposed building constructions of the 22 Edwin Flack Avenue, Sydney Olympic Park development. Indicated glazing requirements are detailed in the table below.

Table 2 – Recommended Glazing Construction

LOCATION	ROOM TYPE	RECOMMENDED GLAZING	ACOUSTIC SEALS
All Facades	Living Rooms	Upgraded Single Glazing	Yes
	Bedrooms	Upgraded Single Glazing	Yes

6.3 ROOF / CEILING

The proposed concrete roof and metal deck roof construction will be sufficient to control traffic and train noise intrusion.

6.4 EXTERNAL WALLS

External walls composed of concrete or masonry elements would not require upgrading.

7. EVALUATION OF ENVIRONMENTAL NOISE INTRUSION

The analysis of potential environmental noise levels impacting on the 22 Edwin Flack Avenue, Sydney Olympic Park development from events within the Sydney Olympic Park precinct has been carried out. The assessment has been based on event noise levels previously obtained by this office. The analysis indicates that the environmental noise exposure at proposed development would exceed Australian Standard criteria without ameliorative treatments.

Due to the nature of the development (multi-storey) and the noise source, the only practical method of ameliorating noise intrusion is to upgrade the acoustic performance of the facades. As the buildings are of predominantly masonry construction this will primarily be limited to the use of upgraded acoustic glazing where required to comply with required internal noise levels. Window sashes would be openable, and be fitted with acoustic seals to prevent sound leakage around the perimeter of the frames. If lightweight roofs are used, the thickness and number of plasterboard sheets used to line the ceilings would be selected to satisfactorily exclude noise.

The level of treatment needed at each location will vary depending on the building elevation, façade orientation and proximity to the Highway.

A full assessment of window and roof requirements would be carried out at Construction Certificate stage when detailed building layouts are available. This should include the measurement of traffic noise levels and the selection of appropriate constructions to comply with the internal noise level requirements of AS 2107.

A preliminary acoustic assessment of glazing requirements indicate a glazing thickness of up to 10.38mm laminated glass will be required to ensure internal noise levels comply with relevant Australian Standard criteria. All external masonry elements of the building will be sufficient for traffic noise intrusion.

Experience with similar developments indicates that the required treatment to ensure internal noise levels comply with Australian Standard criteria is both possible and practical.

8. CONCLUSION

Potential impacts from environmental noise sources on the acoustic amenity of the proposed residential development at 22 Edwin Flack Avenue, Sydney Olympic Park has been assessed. It is concluded that:

- A full assessment would be carried out at Construction Certificate stage to determine the window and roof constructions required to reduce environmental noise from events to acceptable levels as stipulated in AS2107. Our preliminary assessment indicates that compliance with AS2107 would be both possible and practical with minimal acoustic treatments.

We trust that this information is satisfactory. Please contact us should you have any further queries.

Report prepared by

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