

The proposed redevelopment has the potential to change the noise effects (increase and/or decrease) due to the revised design. The following changes have been identified and considered as part of the assessment of noise effects:

- increased crowd size from 47,500 to 60,000
- increased height of the Eastern Stand
- increased 'height' of the South Stand including a roof
- modified egress and activities around the Training Area
- modified car-parking and access arrangements behind the South Stand
- changes to the pedestrian and vehicle flow around the park
- demolition and construction activity
- sporting events during the temporary arrangement with the South and East Stands demolished.

The most technically complex of these issues has been the extent of sound system noise and crowd noise breakout from the stadium with the revised stand design. The issue is a complex interaction of directional noise sources and screening from a complex three-dimensional structure. To enable calculation of this effect, Marshall Day Acoustics has used the internationally recognised sound propagation modelling software called SoundPLAN. This software has been used to analyse a number of different design options and materials and noise break-out, and this analysis has played a significant role in the selection of the final design. The results of the noise modelling on the current design are included in the later sections of this report.

The issue of helicopter noise is not discussed in this report for two reasons. Firstly, there will be no change in the level of helicopter activity due to the proposed redevelopment and secondly, the overall issue of helicopter activity at the Park is under review through the separate application for additional night games.

Marshall Day Acoustics has discussed the issue of helicopter noise during events with the Eden Park Trust Board. Neither the Trust Board nor the Council can control 'over flying' aircraft. Conditions of consent cannot control activities that are outside the control of the EPTB.

Notwithstanding this, the Trust Board has agreed to discuss the issue with Sky TV and the aviation advertisers. We also understand that the Auckland City Council is involved with the aircraft operators developing specific protocols and noise standards to ensure that aircraft noise does not exceed a reasonable level (s16 RMA).

2.0 Noise Performance Standards

A number of different noise performance standards apply to Eden Park in the form of the Auckland City District Plan and some specific conditions of consent. These are outlined below.

2.1 Eden Park Concept Plan

Section D07-18 Concept Plan – Eden Park sets out the noise controls that apply to general activities at Eden Park excluding concerts/special events.

In summary:

The noise level from any activity (excluding crowd noise) measured at or within the boundary of any residential zoned property shall not exceed the following limits;

Daytime (8.00 am to 10.30 pm)	55 dBA L₁₀ and 85 dBA L_{max}
All other times	40 dBA L₁₀ and 75 dBA L_{max}

2.2 1995 Night Game Conditions of Consent

In 1995, Eden Park applied for consent to carry out 16 night-time sporting events. The consent was subsequently granted with a number of conditions which included;

- a maximum of 16 events in any calendar year
- finish times of 9:05 pm (rugby) and 10:00 pm (cricket)
- 55 dBA L₁₀ and 85 dBA L_{max} from 9.00 am to 10:00 pm and 45 dBA L₁₀ and 75 dBA L_{max} at all other times
- noise monitoring to be carried out using a sophisticated electronic monitoring device
- noise monitoring to be undertaken on a specified number of events.

2.3 2006 Night Game Proposed Conditions

The Eden Park has a current application before the Auckland City Council to allow for an increase in the number of night games at the park and a set of proposed noise conditions are currently being worked on by a number of parties. The conditions are based on the 1995 conditions with modifications to eliminate ambiguity in terms of noise averaging and the sampling duration. An additional condition to restrict cricket events to a slightly tighter noise limit is also included.

20. (i) Noise from any activity within Eden Park, except cricket matches, construction activity and crowd noise, shall not exceed the following limits:
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|-------------------|---|
| 9.00am to 10.00pm | 55 dBA L_{10} (13 hr average) |
| | 60 dBA L_{10} (individual 10min sample) |
| | 85 dBA L_{max} |
- (ii) Noise from cricket matches (excluding crowd noise), shall not exceed the following limits:
- | | |
|-------------------|---|
| 9.00am to 10.00pm | 50 dBA L_{eq} (13 hr average) |
| | 55 dBA L_{eq} (individual 10min sample) |
| | 85 dBA L_{max} |
- (ii) Noise levels shall be measured/monitored at or within the boundary of any residentially zoned property. No correction for special audible characteristic (NZS 6802 Clause 4.3) is to be applied to the noise limits or the monitored levels. The average level shall be calculated as a logarithmic energy average over 13 hours (9.00 am to 10.00 pm) of the individual 10 minute samples. The individual 10 minute samples shall be reported along with the average values.
21. Sound systems shall not be used before 10.00 am or after 10.00 pm Monday to Saturday; and before 10.00 am or after 7.00 pm on Sunday.
22. Any display shall not include fireworks or pyrotechnics where detonation will result in the permitted noise levels being exceeded.
23. The output of the sound system shall include three electronic devices:
- (i) An automatic level control device/peak limiter to control the output level.
- (ii) A level recording device that produces a hard print-out of the A-weighted output level from the system and is capable of producing statistical levels (L_{10} and L_{max}).
- (iii) A back-up level display meter (LED, Analogue or similar) which gives a continuous visual reading of the A-weighted output level.
24. Noise monitoring shall be undertaken by an independent qualified expert approved by the Council. Monitoring and reporting shall take place for four major events per calendar year which should include at least one rugby and one cricket match (the events in each year to be selected by the independent monitoring expert) and at least two events shall include field monitoring. The results of monitoring will be submitted to the Council and the Community Liaison Group, with further monitoring being carried out as required by the Council to ensure compliance.
25. The above noise levels shall be measured and assessed in accordance with the requirements of the NZS 6801:1991 "Measurement of Sound", and NZS 6802:1991 "Assessment of Environmental Sound" except for the express provisions within conditions 20, 21, 22, 23 and 24. The noise shall be measured with a sound level meter complying at least with the International Standard IEC 651 (1979) Sound Level Meters, Type 1.