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City of Stirling
25 Cedric Street
Stirling WA 6021

SLR Project No.: 675.072926.00001

RE: Scarborough Beach Tennis

Noise Maps

1.0 Introduction

In accordance with your instructions, this letter presents modelling of noise emissions from an existing outdoor beach tennis facility at Beach Tennis WA, 75 Deanmore Rd, Scarborough WA 6019.

1.1 About the author

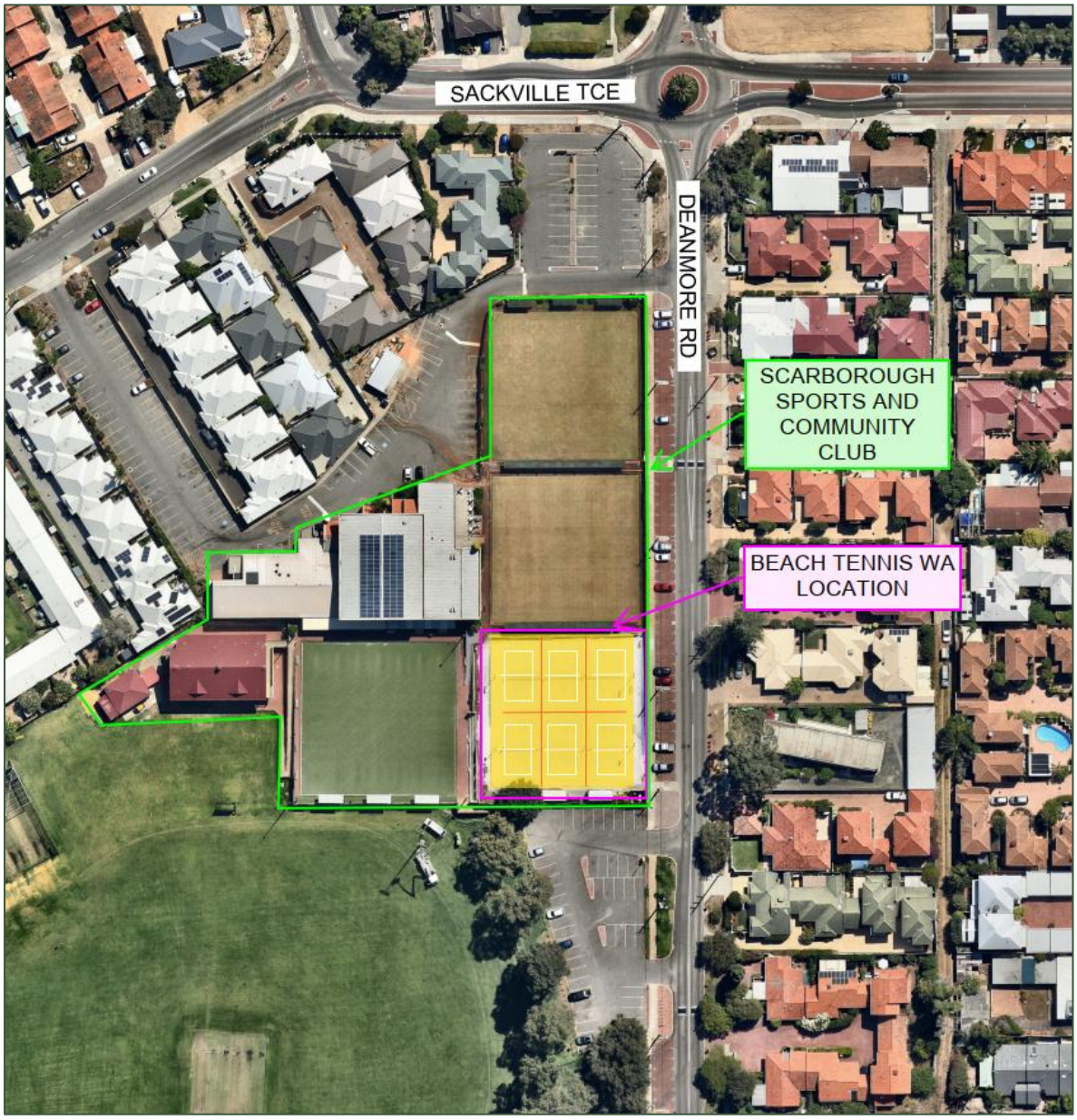
SLR Consulting Australia Pty Ltd (SLR) – Perth office is a member of the Association of Australian Acoustical Consultants. This may be verified by visiting the AAAC website 'WA' page at https://aaac.org.au/wa.

The author and reviewer of this report are qualified and experienced in the area of environmental noise assessment and who by their qualifications and experience is eligible to hold membership of the Australian Acoustical Society. This may be verified by visiting the AAS website and the 'Find a Member' tool at https://www.acoustics.org.au/.

1.2 Site locality

The Beach Tennis WA is an outdoor beach tennis facility operating within the Scarborough Sports and Community Club. It consists of six (6) courts. **Figure 1** presents the location of the courts in the context of surrounding.

Figure 1 Site and surroundings.



2.0 Environmental noise criteria

Environmental noise emissions from this site are regulated under the *Western Australia Environmental Protection (Noise) Regulations 1997* ("EPNR", "the Regulations"). To achieve compliance with the Regulations, noise levels at nearby residential areas are not to exceed defined limits referred to as Assigned Noise Levels.

These limits are determined from consideration of prevailing background noise levels and 'influencing factors' (IFs) that consider the level of commercial and industrial zoning in the locality. The influencing factor considers zoning and road traffic within 100 m and 450 m of the nearest sensitive receiver of interest.

A summary of the applicable noise limits is provided in **Table 1**.

Table 1 Summary of assigned noise levels

Part of premises receiving noise	Time of day	Assigned level, dB		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday ('Day')	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays ('Sundays')	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days ('Evening')	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 Monday to Saturday and 0900 hours Sunday and public holidays ('Night')	35 + IF	45 + IF	55 + IF
Noise Sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use.	All hours	60	75	80
Noise Sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises	All hours	65	80	90

If noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, then a series of adjustments must be added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level.

The adjustments are detailed in **Table 2** and are further defined in Regulation 9(1) of the Environmental Protection (Noise) Regulations 1997.

Table 2 Adjustments to the emitted levels

Noise characteristic	Definition	Adjustment if present
Adjustment where noise emission is not music[1]		
Tones	Where the difference between the A weighted sound pressure level in any one third octave ban and the arithmetic average of the A weighted sound pressure levels in the two adjacent one third octave bands is greater than 3 dB in terms of LAeq,T where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as LASlow levels.	+5 dB
Modulation	A variation in the emission of noise that – Is more than 3 dB LAFast or is more than 3 dB LAFast in any one third octave band; Is present for at least 10% of the representative assessment period; and, Is regular, cyclic and audible.	+5 dB
Impulsiveness	Present where the difference between the LAPeak and LAmax is more than 15 dB when determined for single representative event.	+10 dB
Adjustment where noise emission is music		
No Impulsiveness	Where impulsiveness is not present	+10 dB
Impulsiveness	Where impulsiveness is present	+15 dB

Note 1 Where noise emission is not music, these adjustments are cumulative to a maximum of 15 dB.

3.0 Modelling methodology and assumptions

The study applied the following approach:

- As part of previous assessment, key noise sources were identified, and their noise emissions established to determine overall sound power levels to inform modelling.
- Noise predictions for the site were developed utilising the SoundPLAN noise prediction software (version 8.2). The noise model applied geospatial datasets for existing terrain, buildings and structures. The model implements the International Standard ISO 9613-2 method for calculating outdoor noise propagation.
- Given the expected propagation distances and ground covering, ground surfaces were modelled as 80% absorptive at the courts and 60% elsewhere. Losses associated with tree/foliage screening were not modelled. Roads and carparks were modelled as fully sound reflective surfaces.
- Modelling assumes an average time of game noise emission to be 30 minutes for 1 hour match time. This is to account for time where no play is on/off for breaks between games and sets etc. This assumption is made based on the beach tennis rules as posted by the International Tennis Federation.
- The noise levels from the site operation were predicted at ground level (1.5 m above the ground) and upper level (6 m above the ground).

- The extent of noise map is limited to 300 m from the beach tennis venue. Noise beyond this distance is unlikely to be audible over the ambient noise in metro areas and coastal environment.
- Two modelling scenarios are presented for typical game play using all six (6) courts:
    - Without background music played on site,
    - With background music.
- Whilst the modelling is based on measurements of actual gameplay, there remains variability between games and participants.
- Modelling assumes music played using one loudspeaker located at southern boundary of the courts facing the courts (facing north).
- Noise levels used in modelling of music on site are based on the data collected during the noise monitoring undertaken in late 2024. These levels can vary in real life scenario depending on the number of speakers, volume set up, therefore the map results should be considered as indicative only.
- In order to keep the results simplified, it is also assumed that the difference between music emission statistical levels L_{A1} and L_{A10} is marginal and can be disregarded in modelling.

4.0 Modelling results

Noise levels from continuous operation of six courts have been predicted in the project area.

The following figures indicate the distribution of predicted noise levels from the beach tennis site in terms of L_{A1} and L_{A10}, without and with music.

It should be noted that the map results of a game play do not include a 10 dB adjustment for impulsiveness that may be present at receiver locations. Whilst the activity is predicted to meet the definition under the Regulations at close distances, measurements indicate that there is reasonable possibility that it would not be measured as impulsive under the Regulations (“when determined for a single representative event”) on the basis of increased distances to the receivers and the increased influence of ambient noise.

The results for scenarios with music played include adjustment of 10 dB for music, assuming no impulsiveness is present at receiver locations.

4.1 Six courts without music at 1.5 m

Figure 2 Noise Contour Map – six courts no music – L_{A10}, dB – any time.

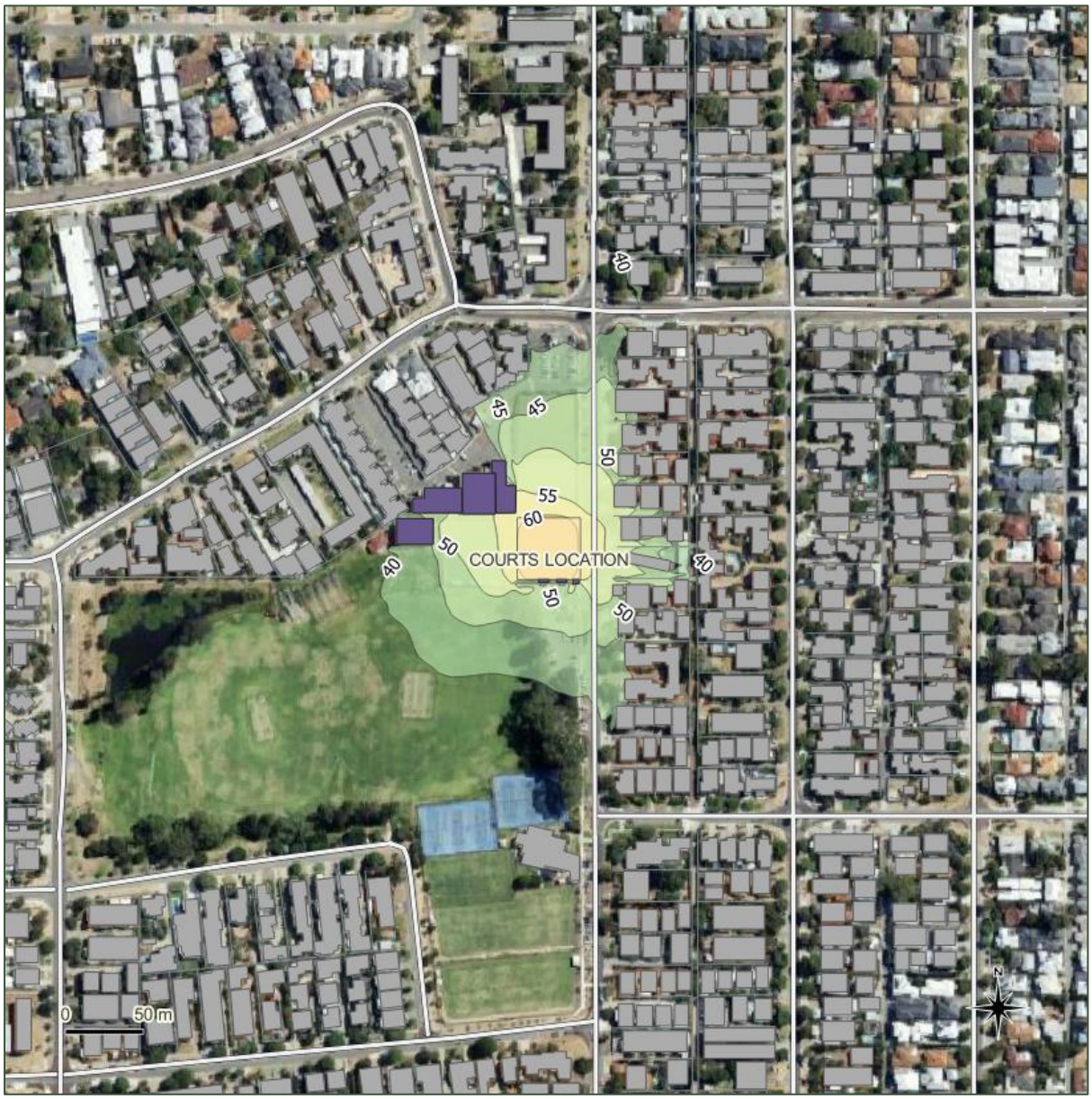


Figure 3 Noise Contour Map – six courts no music – L_{A1}, dB – any time.

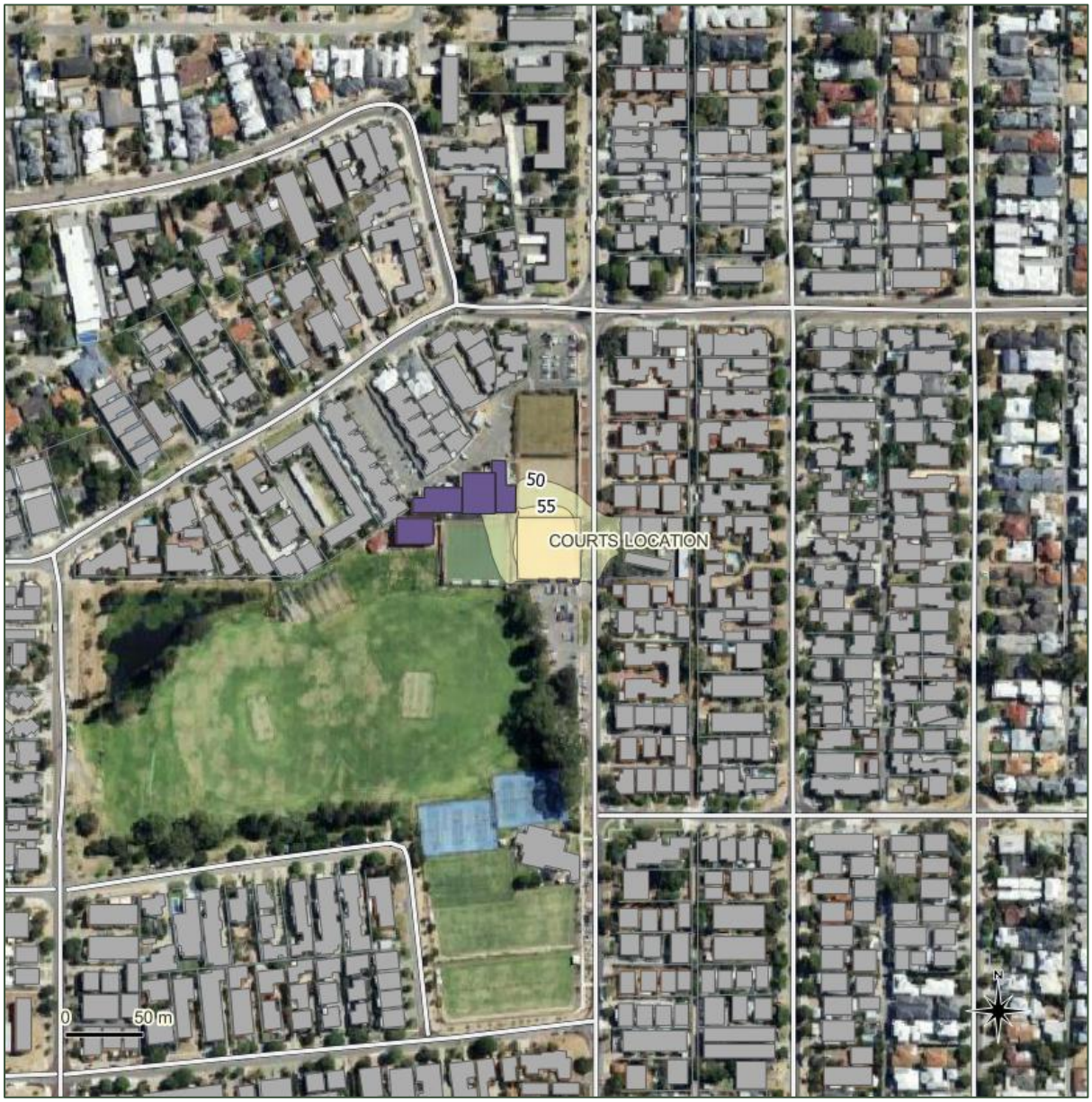
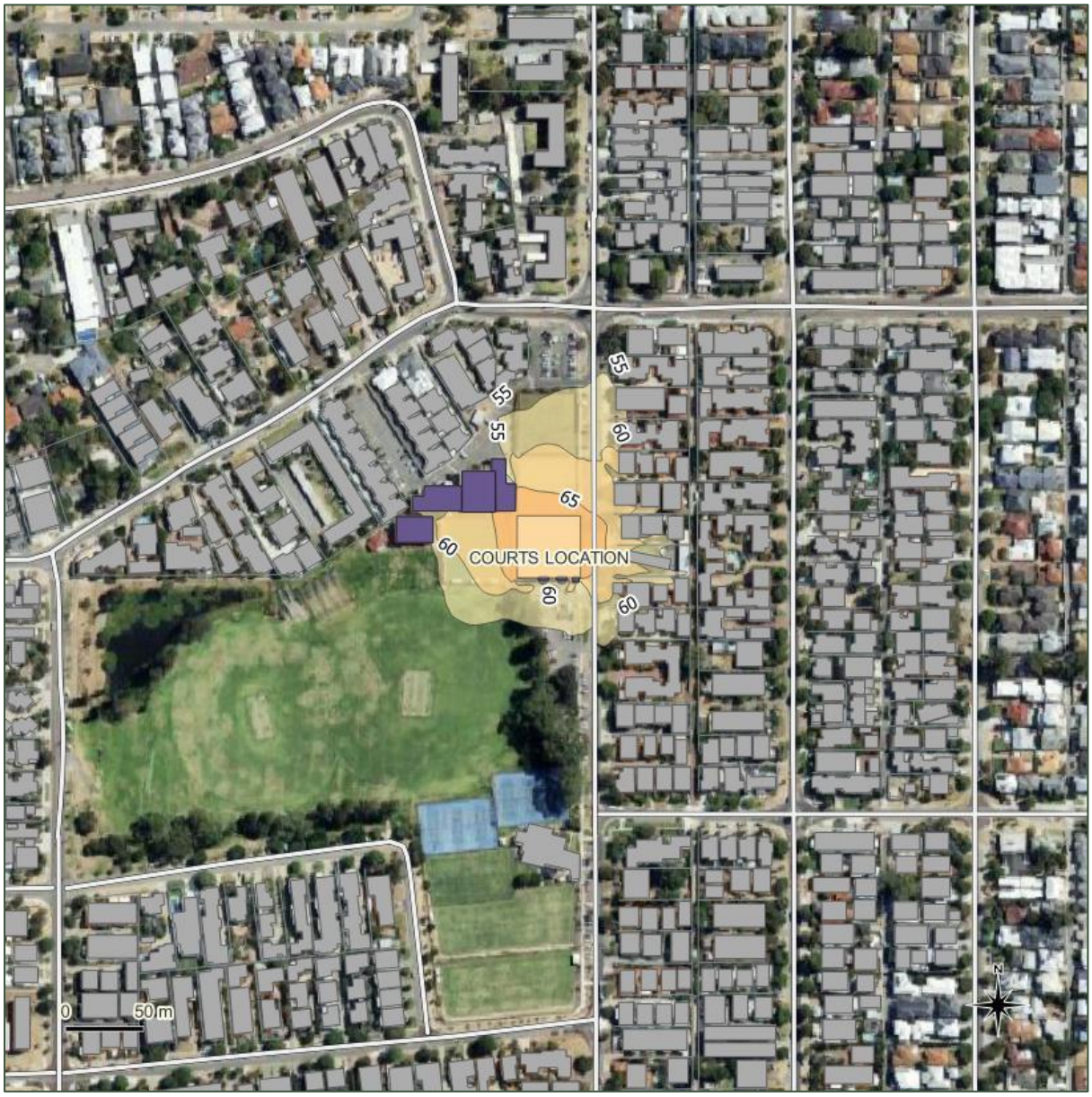


Figure 4 Noise Contour Map – six courts no music – L_{Amax}, dB – any time.



4.2 Six courts without music at 6 m

Figure 5 Noise Contour Map – six courts no music – L_{A10}, dB – any time.

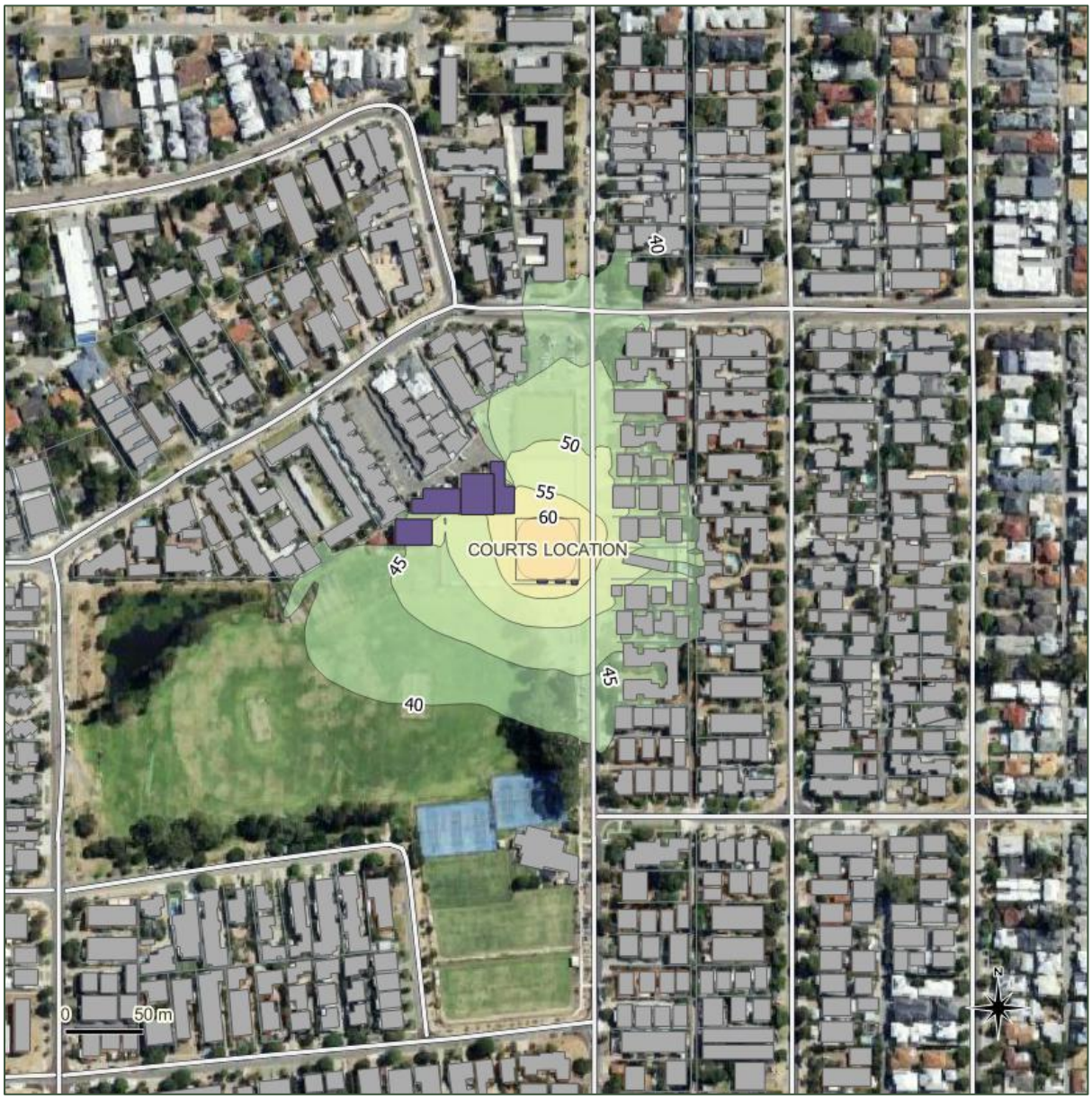


Figure 6 Noise Contour Map – six courts no music – L_{A1}, dB – any time.

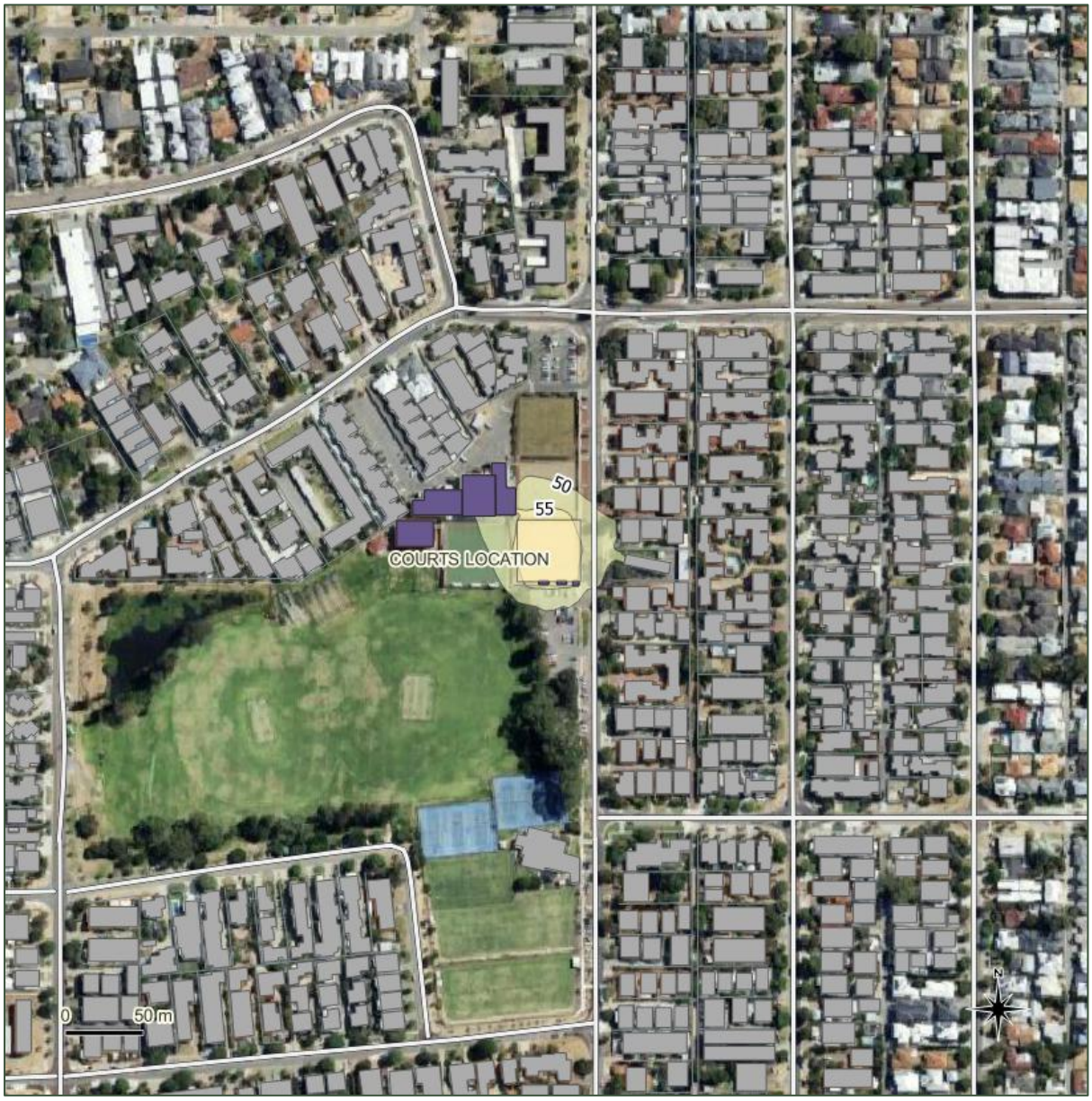
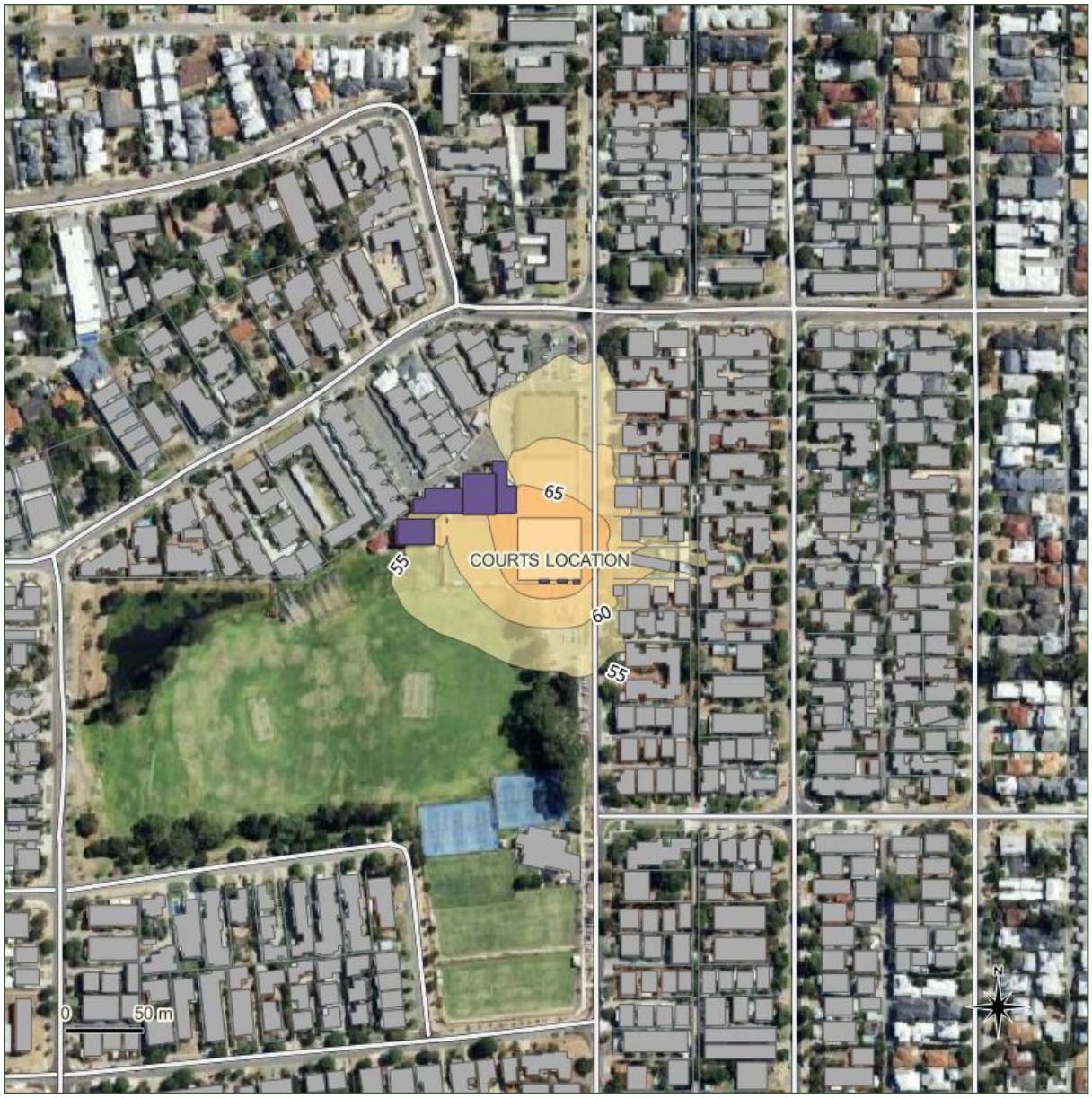


Figure 7 Noise Contour Map – six courts no music – L_{Amax}, dB – any time.



4.3 Six courts with music at 1.5 m

Figure 8 Noise Contour Map – six courts with music – L_{A10}, dB – any time.

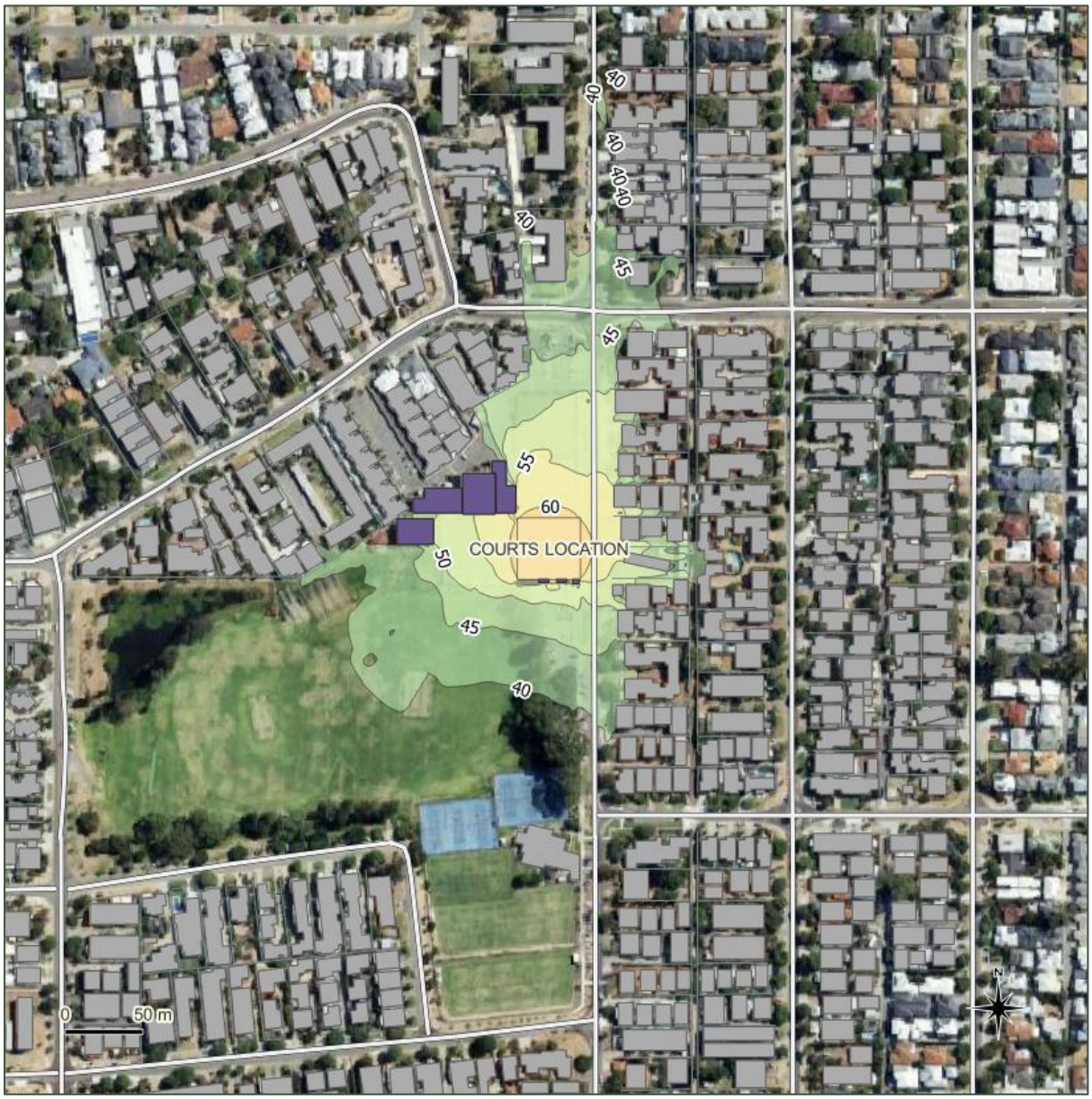


Figure 9 Noise Contour Map – six courts with music – L_{A1}, dB – any time.

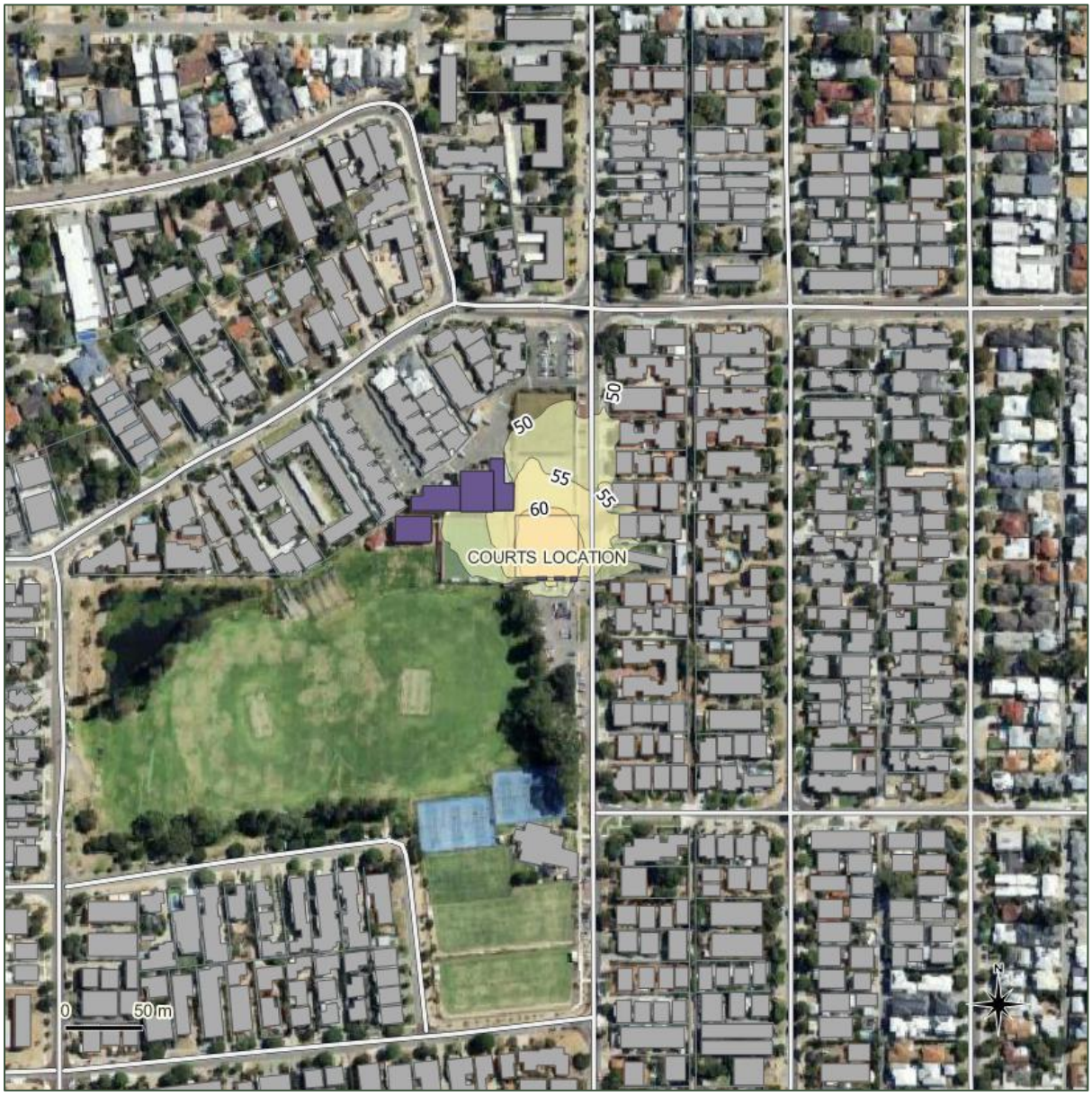
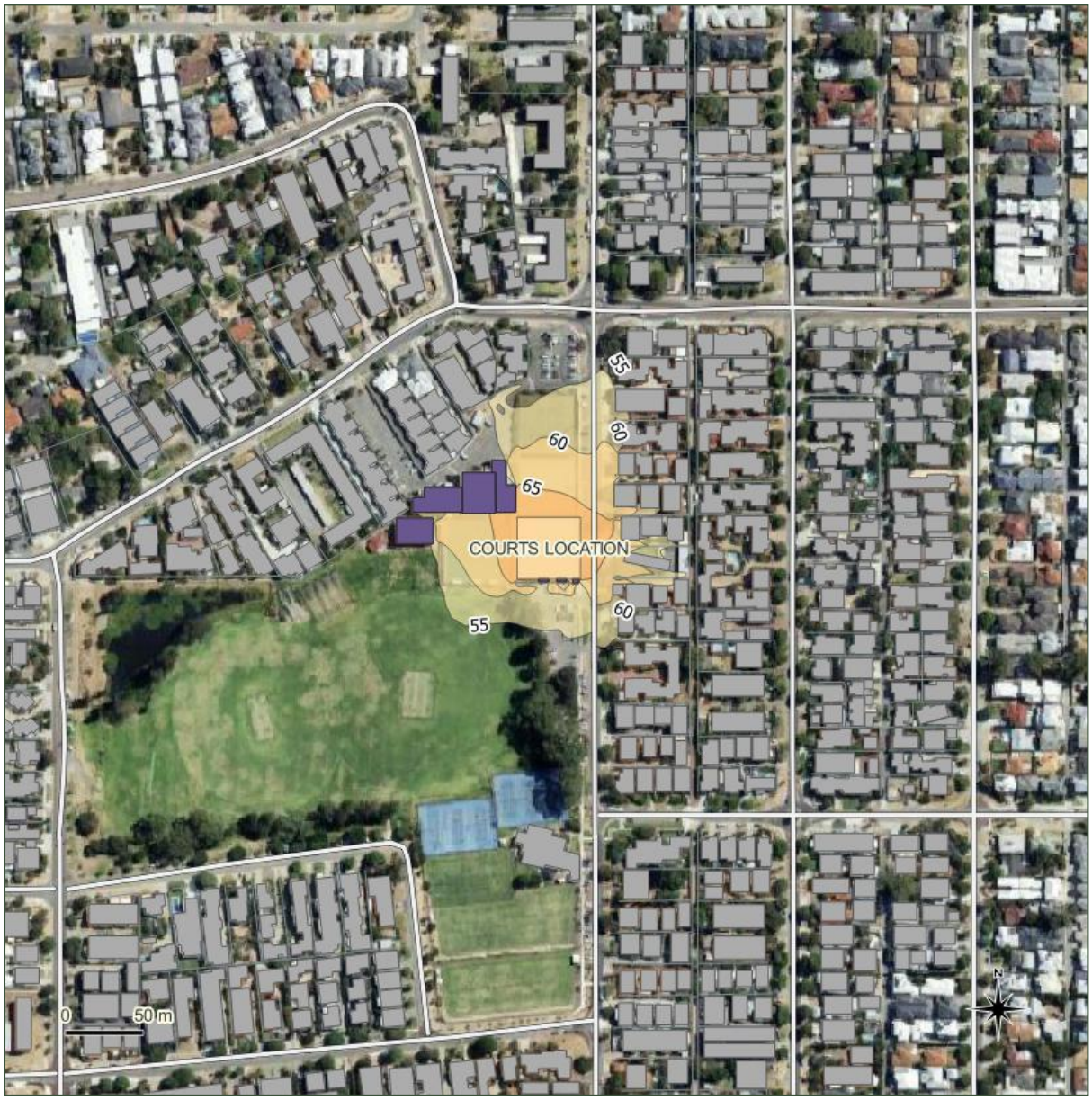


Figure 10 Noise Contour Map – six courts with music – L_{Amax}, dB – any time.



4.4 Six courts with music at 6 m

Figure 11 Noise Contour Map – six courts with music – L_{A10}, dB – any time.

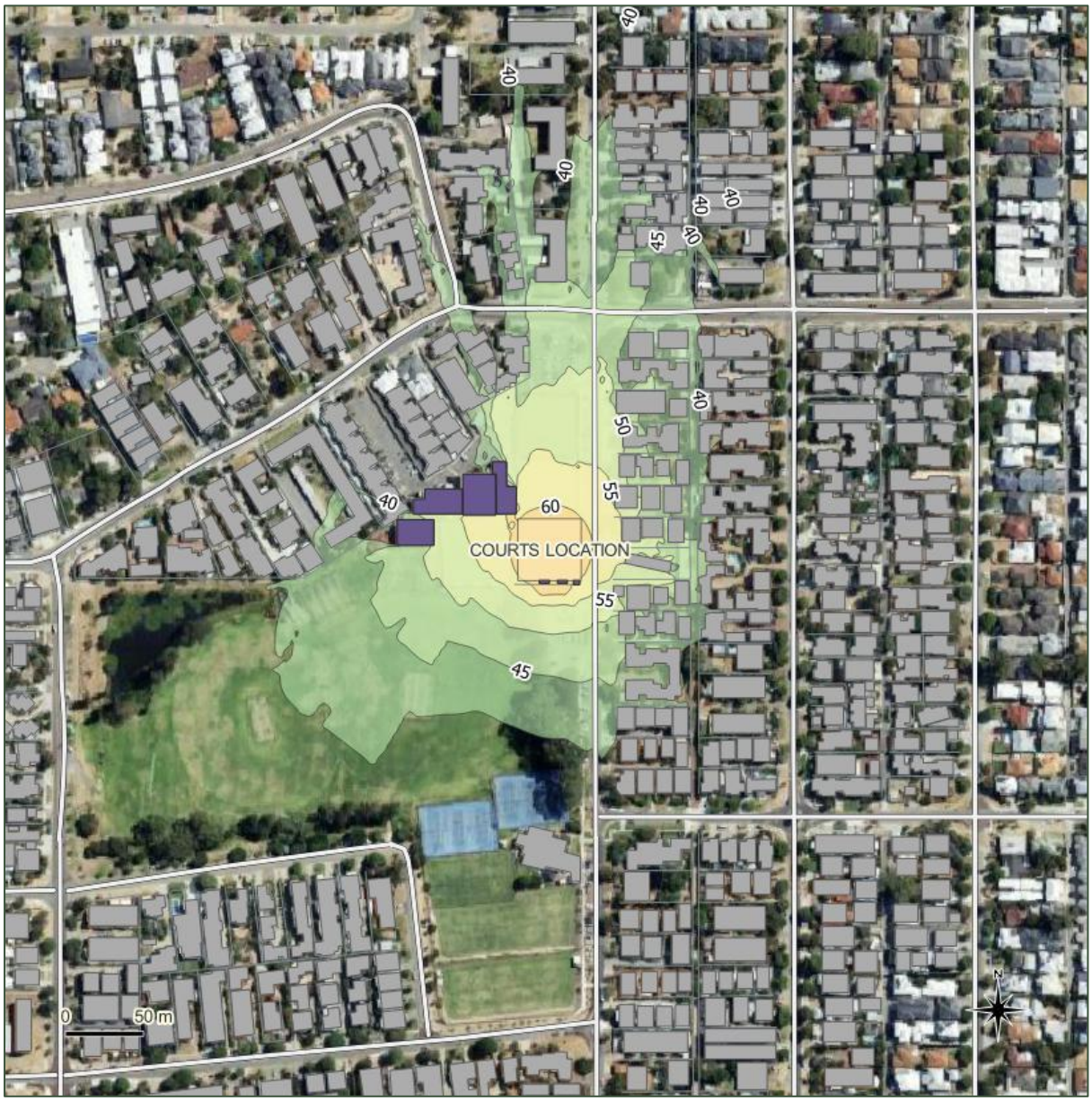


Figure 12 Noise Contour Map – six courts with music – L_{A1}, dB – any time.

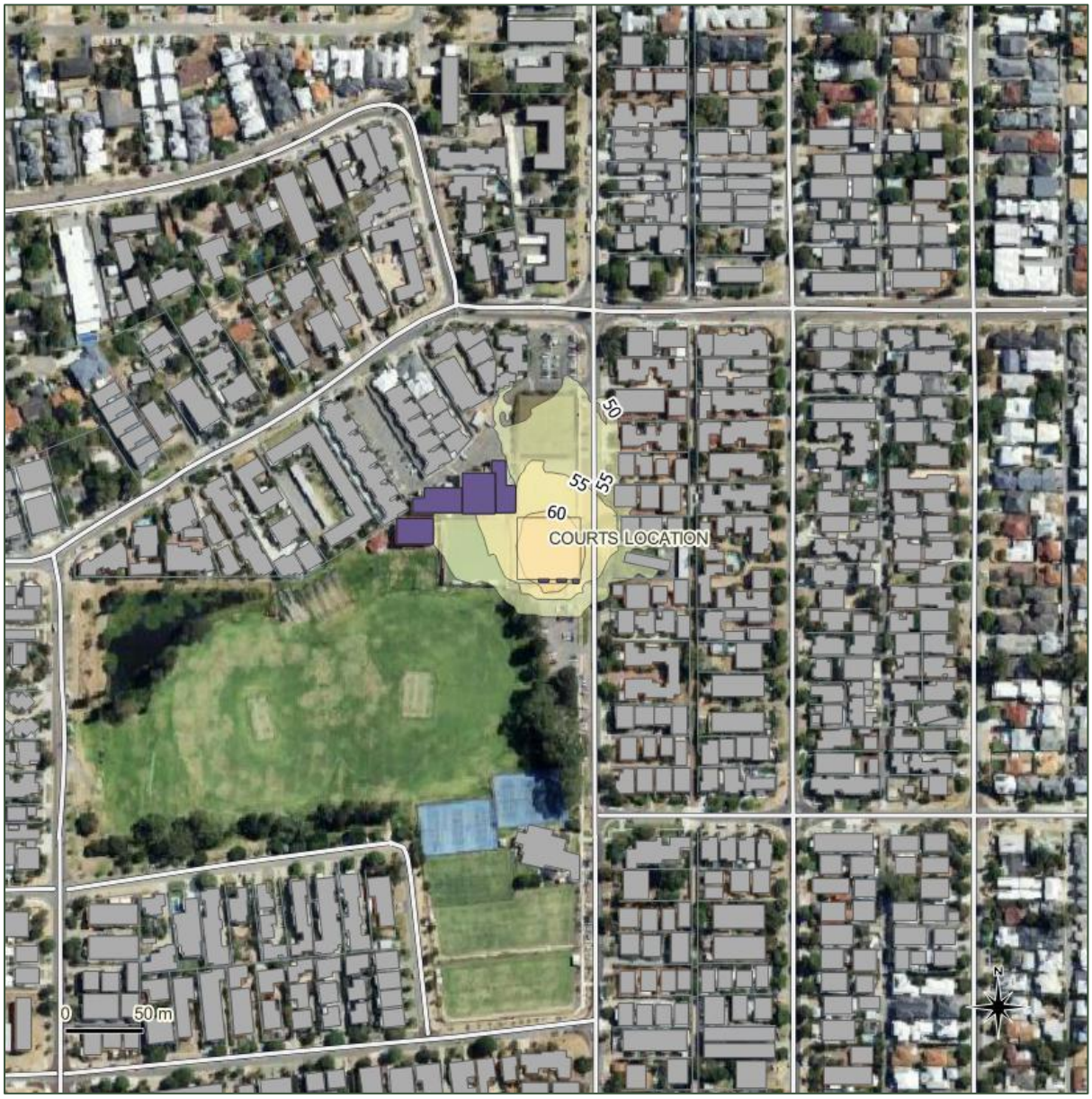
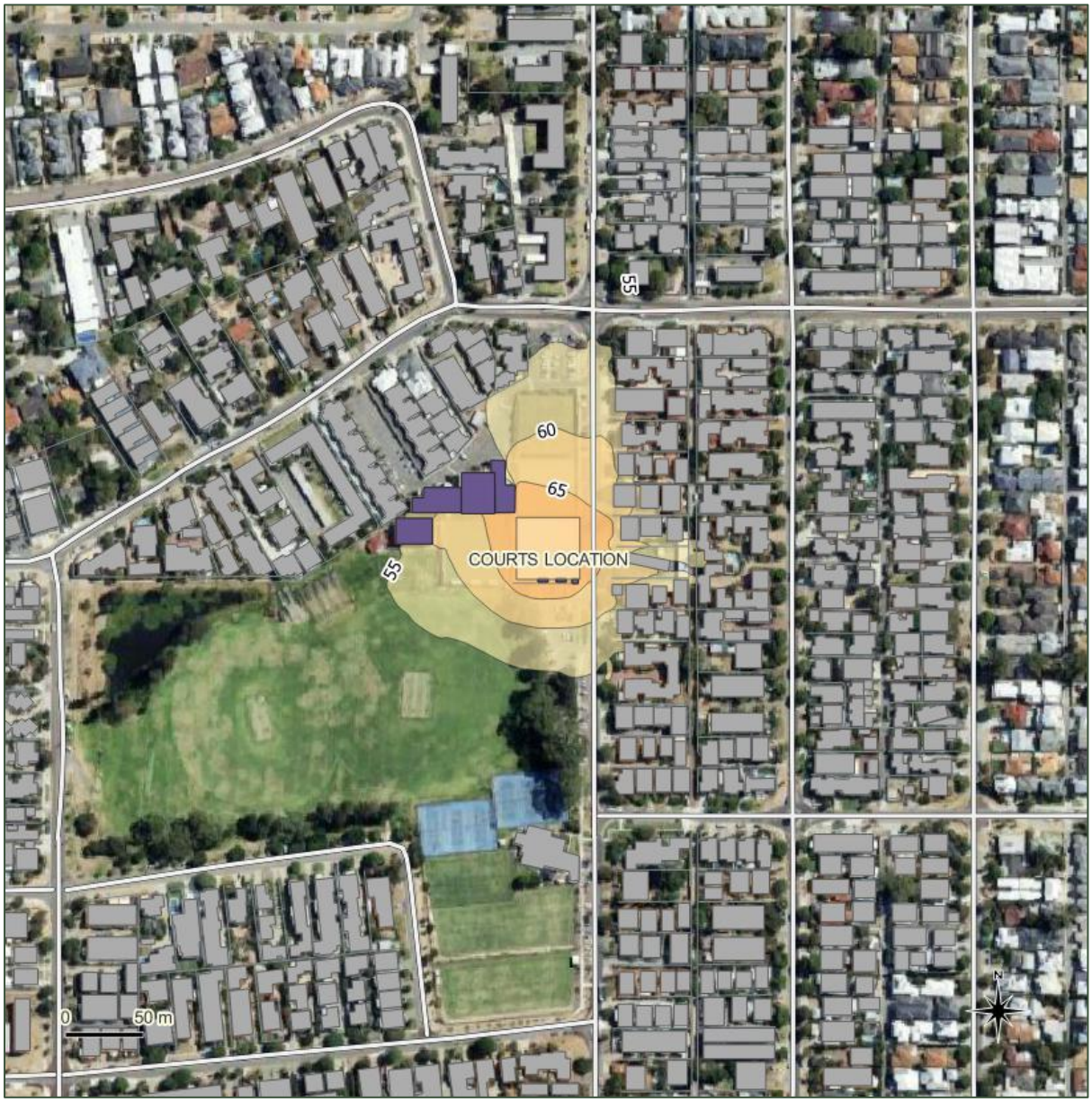


Figure 13 Noise Contour Map – six courts with music – L_{Amax}, dB – any time.



I trust the above is satisfactory. Should you have any further queries, I can be contacted using the details provided.

Regards,

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