eastern boundary of the development. This level is below the noise criterion of **56 dBA** in the daytime in section 5.6 and is therefore acceptable.

The predicted L_{eq} level of noise from 75 cars in 15 minutes in the car park in the evening, for noise sources at location B is **58 dBA** with the recommended sound barrier along the eastern boundary of the development. This level is below the noise criterion of **60 dBA** in the evening in section 5.6 and is therefore acceptable.

For the purpose of assessing the maximum typical level of noise emission from the car park driveway entrance at receptor location D, we have assumed a flow of cars equivalent to 75 cars in 15 minutes leaving the driveway during the evening and 20 cars leaving the driveway during the daytime.

The predicted L_{eq} level of noise from 20 cars leaving via the car park drive way during the daytime, for noise sources at the nearest residential premises at location D is **47 dBA**. This is less than the noise criterion of **56 dBA** and is therefore acceptable.

The predicted L_{eq} level of noise from 75 cars leaving via the car park drive way during the evening, for noise sources at the nearest residential premises at Location D is **52 dBA**. This is less than the noise criterion of **60 dBA** in section 5.6 and is therefore acceptable.

6.5.2 Special Event Kitchen and Dining Hall Noise Emission

For the purpose of assessing the maximum typical level of noise emission from the kitchen and dining room during special events, we have assumed a crowd of 90 people within the Dining Hall and 10 people within the Kitchen *with the windows and doors open*. Based on information in Harris and in our noise level database gathered over many years, we calculate the sound power levels shown in Table 6.5 below.

Table 6.5.1 L_{eq} Noise levels of people in conversation

Description	SWL dBA	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
L_{eq} level of 1 male, normal speech	**68**	50	60	67	68	60	57	51	45
L_{eq} level of 45 males, normal speech (50 % talking)	**82**	64	73	71	82	73	71	65	59
L_{eq} level of 1 female, normal speech	**64**	55	61	63	64	59	52	45	41
L_{eq} level of 45 females, normal speech (50 % talking)	**78**	69	75	77	78	73	66	59	55

The predicted L_{eq} level of noise from people talking inside Dining Hall and Kitchen *with windows and doors open* and a kitchen exhaust fan for noise sources at the nearest residential premises at 45 Edensor Road is **48 dBA**. This is less than the noise criterion of **56 dBA** in Section 5.6 of this report and is therefore acceptable.

6.5.3 Temples and Terrace Noise Emission

For the purpose of assessing the maximum typical level of noise emission from the temple and terrace during special events, we have assumed a group of 90 people within the temple and 90 on the terrace. Based on information in Harris[3] and in our noise level database gathered over many years, we calculate the sound power levels shown in Table 6.2 below.

Table 6.2.1 L_{eq} Noise Levels of people in conversation

Description	SWL dBA	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
L_{eq} level of 1 male, normal speech	**67**	50	60	67	68	60	57	51	45
L_{eq} level of 90 males, normal speech (50 % talking)	**84**	67	77	84	85	77	77	68	62
"Wooden Fish" Drum	**82**	72	67	91	73	72	66	60	47
Large Drum and Bell	**87**	92	99	91	80	72	79	78	64

The predicted L_{eq} level of noise from people talking inside the temples and on the terrace *with the temple doors open*, for noise sources at the nearest residential premises at 45 Edensor Road is **47 dBA**. This is less than the noise criterion of **56 dBA** in Section 5.6 of this report and is therefore acceptable.

6.5.4 Ullambana Temples and Terrace Noise Emission

For the purpose of assessing the maximum typical level of noise emission from the temple and terrace for Ullambana ceremonies, we have assumed a crowd of 65 people within the Columbarium and temples with musical instruments with the temple doors open and 25 people on the terrace, with the inclusion of a public address system. Based on information in Harris[3] and in our noise level database gathered over many years, we calculate the sound power levels shown in Table 6.5.2 below.

[3] Handbook of Acoustical Measurements and Noise Control, Third Edition, Cyril M. Harris, McGraw-Hill Inc; New York, (Page 16.2)

Table 6.5.2 L_{eq} Noise Levels of people in conversation

Description	SWL dBA	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
L_{eq} level of 90 males, normal speech (50 % talking)	**84**	67	77	84	85	77	74	68	62
L_{eq} level of normal speech amplified through P.A.	**87**	70	80	87	88	80	77	71	65
"Wooden Fish" Drum	**82**	72	67	91	73	72	66	60	47
Large Drum and Bell	**87**	92	99	91	80	72	79	78	64

The predicted L_{eq} level of noise during Ullambana from musical instruments, people talking inside the temples *with the temple doors open*, on the terrace, and a public address system, for noise sources at the nearest residential premises at 45 Edensor Road is **47 dBA**. This is less than the noise criterion of **56 dBA** in Section 5.7 of this report and is therefore acceptable.

6.5.5 Special Event New Years Eve Lion Dancing Noise Emission

During New Years Eve celebrations a lion dance will be performed, we have assumed this will take place on the terraces in front of the main temple. A lion dance involves two dancers performing in a costume accompanied by musicians playing cymbals, drums and bells and will last for approximately 10- 15 minutes. Day Design has measured musicians and lion dancers while performing and we have calculated the sound power levels shown in Table 6.5.3 below.

Table 6.5.3 L_{eq} Noise Levels of Lion Dancing Performance

Description	SWL dBA	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
4 pairs of gongs, Large Drum and Bell, with dancers	**118**	113	129	120	112	112	105	107	104

The predicted L_{eq} level of noise during New Years Eve Lion Dancing Performances on the terrace for noise sources at the nearest residential premises at 45 Edensor Road is **62 dBA** and at 50 Edensor Road is **72 dBA** . This level exceeds the noise criterion of **67 dBA** in Section 5.6 and will require noise controls as recommended in Section 7.0.

7.0 NOISE CONTROL RECOMMENDATIONS

The predicted level of noise emission from the proposed development is in excess of the acceptable noise criterion established in Section 5 of this report. Therefore engineering noise control will be required. We recommend the following acoustical treatment:

7.1 Sound Barrier Wall

We recommend a minimum **2.1 metre high sound barrier wall** be constructed on the eastern boundary to attenuate the noise to the nearest residential premises at 45 Edensor Road. The sound barrier may be constructed from Colorbond steel or brick masonry with the following to meet flood requirements:

- Hinged gate sections installed to a height of 300 mm in the colorbond steel or brick fence; **or**
- 300 mm deep acoustic louvres with an insertion loss performance equal to or greater than that specified in Table 7.1 below. The perimeter of the louvres, between the louvre and the wall opening, should be caulked with a mastic sealant.

The acoustic louvers should be installed to a height of 300 mm necessary to meet the flood requirements, the remaining height of the sound barrier may be achieved with Colorbond steel.

Care must be taken to ensure that there are no gaps in the sound barrier walls (apart from the openings in the louvred sections) through which sound may penetrate.

Table 7.1 Acoustic Louvre Insertion Loss

	Minimum Insertion Loss (dB) at Octave Band Centre Frequencies (Hz)							
	63	125	250	500	1k	2k	4k	8k
Acoustic Louvres* (300 mm deep)	6	3	5	10	13	17	18	15

**Insertion loss performance based on NAP Silentflo 300 S-Line louvre (Ph 02 9712 0722).*

7.2 Mechanical Plant

We recommend that the air conditioning condenser for the temple have a maximum sound power level of **80 dBA** and only operate during the hours from 7am to 6 pm. We also recommend that the air conditioning condenser for the caretaker's residence have a maximum sound power level of **70 dBA**.

Additional acoustical treatment may be required for the condensers with higher sound power levels.

7.3 Public Address System

We recommend the public address system's use be restricted to special events prior to 10 pm as the public address system will not meet noise intrusive night time criteria. We also recommend that during special events the level of the public address system be restricted to 75 dB at a distance of three metres.

7.4 New Years Eve Lion Dancing Performance

The predicted level of noise emission from the lion dancing activity carried out during the New Year special event is in excess of the noise criteria in Section 5.6 of this report. We understand that the lion dancing will occur only once a year for less than 15 minutes. Given that it will occur for such a short period of time, the noise impact from such activity will be minimal. Notwithstanding this, we recommend the following noise management controls to minimise the noise impact at the neighbouring residences:

- Lion dancing performances must be completed before 10 pm.
- Inform the neighbours about the nature of the special events and any associated noisy activities such as the lion dancing. The neighbours should be notified when the noisy activities are to be carried out.
- Contact details of a person that can provide information about the events should be posted outside the premises.
- Contact details of a person that can receive and manage noise complaints should also be posted outside the premises.
- Implement all feasible and reasonable measures to address the source of complaint.

Should a justified noise complaint not be resolved, noise monitoring should be carried out for future events at the affected receptor location and appropriate measures should be taken to reduce the noise emission.

Measures to reduce the noise emission may include a 2 metre high temporary sound barrier wall erected on the southern end of the terrace or to restrict the lion dancing performances inside the temple with the doors closed. The temporary sound barrier wall should be constructed using 19 mm plywood or a temporary 'Echo Barrier' (www.echobarrier.com.au).

7.5 Landscaping

Landscaping between the noise source and the receptors, in the form of trees and tall shrubs that provide visual screening of the noise source, will not reduce noise levels appreciably. However, they tend to make intrusion of noise psychologically less offensive.

7.6 Construction Disclaimer

Recommendations made in this report are intended to resolve acoustical problems only. We make no claim of expertise in other areas and draw your attention to the possibility that our

recommendations may not meet the structural, fire, flood, thermal or other aspects of building construction. We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

8.0 PREDICTED NOISE LEVELS AT RECEPTOR LOCATIONS

Assuming the recommendations of Section 7 have been satisfactorily implemented, the cumulative intrusive L_{eq} noise levels at various receptor locations is calculated to be as shown below in Table 8.1. It is assumed that during meal times the majority of temple visitors will be in the dining hall and therefore significantly less people will be in the temples and on the terraces.

Table 8.1 Predicted Leq Noise Levels at Receptor Locations during Fortnightly Events (After noise controls have been implemented)

Receptor Location	Activity	Predicted Level	Acceptable Level	Compliance
Location 'B' 45 Edensor Road	- Noise from car park,	49 dBA		
	- Mechanical plant,	33 dBA		
	- Activities inside temple	43 dBA		
	- People talking on the terrace	34 dBA		
Total Noise Level at Location B		51 dBA	51 dBA	Yes
Location 'B' 45 Edensor Road (during meal times)	- Noise from the Kitchen	42 dBA		
	- Noise from the Dining Hall	39 dBA		
	- Noise from mechanical plant	33 dBA		
	Noise from the Kitchen Exhaust Fan	39 dBA		
Total Noise Level at Location B During Meals		46 dBA	51 dBA	Yes
Location 'B' 45 Edensor Road (noise from mechanical plant at night)		33 dBA	37 dBA	Yes
Location 'C' 50 Edensor Road	- Noise from car park,	42 dBA		
	- Mechanical plant,	33 dBA		
	- Activities inside temple	36 dBA		
	- People talking on the terrace	43 dBA		
Total Noise Level at Location C		46 dBA	51 dBA	Yes
Location 'D' 56 Edensor Road (noise from driveway entrance)		47 dBA	51 dBA	Yes

Table 8.2 Predicted Leq Noise Levels at Receptor Locations for Special Events
(After noise controls have been implemented)

Receptor Location	Activity	Predicted Level	Acceptable Level	Compliance
Location 'B' 45 Edensor Road	- Noise from car park,	56 dBA		
	- Mechanical plant,	33 dBA		
	- People talking inside temple	44 dBA		
	- People talking on the terrace	47 dBA		
Total Noise Level at Location B (Chinese New Year)		58 dBA	60 dBA	Yes
Location 'B' 45 Edensor Road (during meal times)	- Noise from the Kitchen	42 dBA		
	- Noise from the Dining Hall	41 dBA		
	- Noise from mechanical plant	44 dBA		
	- Noise from the Kitchen Exhaust Fan	39 dBA		
Total Noise Level at Location B (Chinese New Year during meals)		48 dBA	60 dBA	Yes
Location 'C' 50 Edensor Road	- Noise from car park,	56 dBA		
	- Mechanical plant,	44 dBA		
	- People talking inside temple	37 dBA		
	- People talking on the terrace	46 dBA		
Total Noise Level at Location C (Chinese New Year)		57 dBA	60 dBA	Yes
Location 'C' 50 Edensor Road	- Lion dancing performance	67 dBA		
Total Noise Level at Location C during Lion Dancing performances		67 dBA	67 dBA	Yes
Location 'D' 56 Edensor Road on Chinese New Year (noise from driveway entrance)		52 dBA	60 dBA	Yes

Table 8.3 Predicted Leq Noise Levels at Receptor Locations for Special Events Cont'd

Receptor Location	Activity	Predicted Level	Acceptable Level	Compliance
Location 'B' 45 Edensor Road	- Ullambana ceremonies inside Columbarium	32 dBA		
	- noise from car park,	38 dBA		
	- mechanical plant,	33 dBA		
	- people talking inside temple	40 dBA		
	- people talking on the terrace	32 dBA		
	- dining hall and kitchen	45 dBA		
Total Noise Level at Location B during Ullambana Ceremonies		47 dBA	56 dBA	Yes
Location 'B' 45 Edensor Road (during meal times)	- Noise from the Kitchen	42 dBA		
	- Noise from the Dining Hall	41 dBA		
	- Noise from mechanical plant	44 dBA		
	- Noise from the Kitchen Exhaust Fan	39 dBA		
Total Noise Level at Location B (Ullambana during meals)		48 dBA	56 dBA	Yes

9.0 NOISE IMPACT STATEMENT

Measurements and computations show that, provided the recommendations in Section 7 of this report are implemented, the level of noise emitted by the proposed development at 47-51 Edensor Road, Cabramatta will meet the NSW Industrial Noise Policy's acceptable noise level requirements as detailed in Section 5 of this report.

We are of the opinion that sound emitted from this development will not cause "offensive noise" as defined by the Protection of the Environment Operations Act 1997.

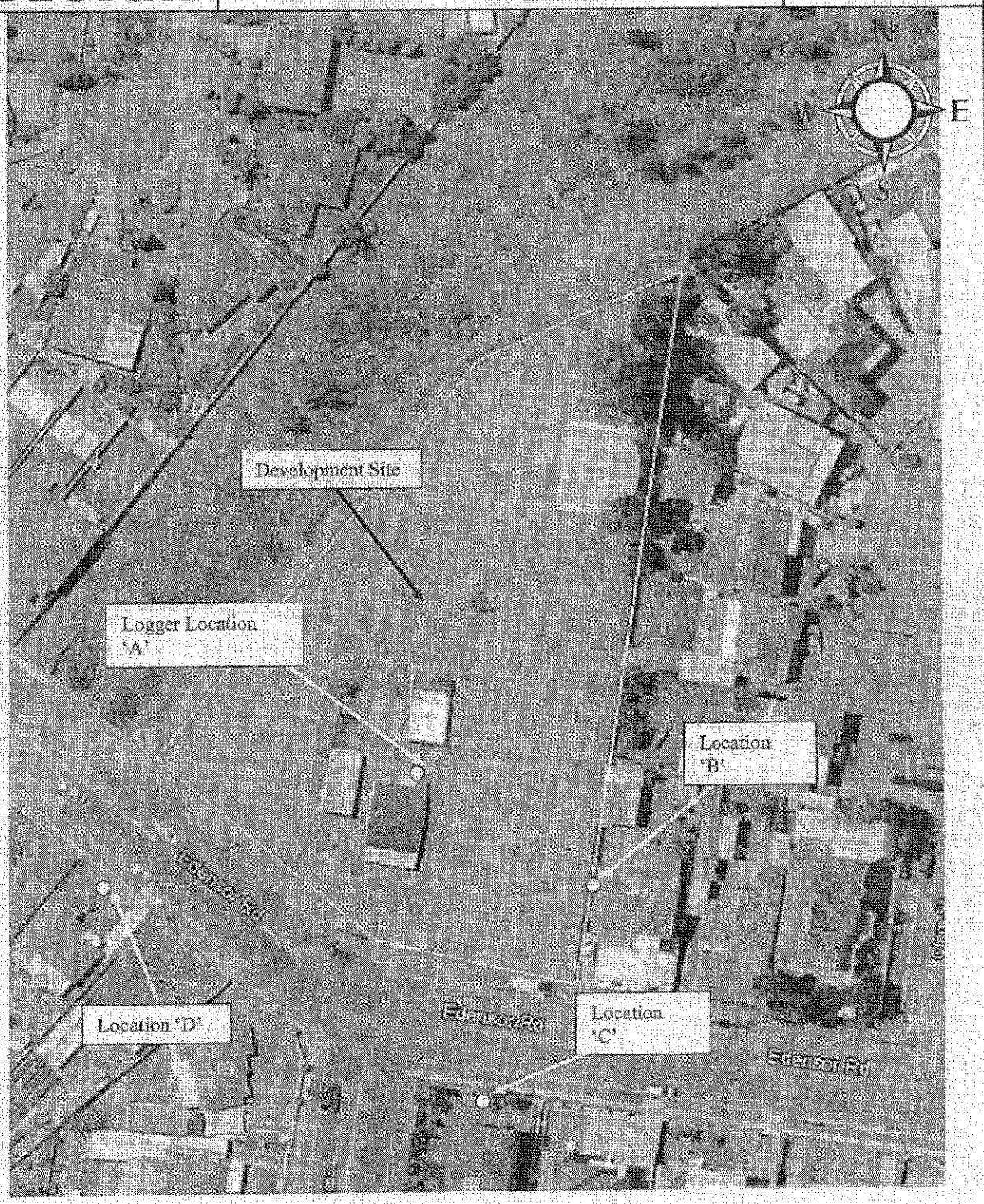
Thomas Roseby, MDesSc (Audio and Acoustics)
Acoustical Consultant
for and on behalf of Day Design Pty Ltd.

A.A.A.C. MEMBERSHIP
Day Design Pty Ltd is a member company of the Association of Australian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

Attachments:

- Figure 1 – Location Plan
- Figure 2 – Ambient Noise Survey
- Figure 3 – Architectural Drawings

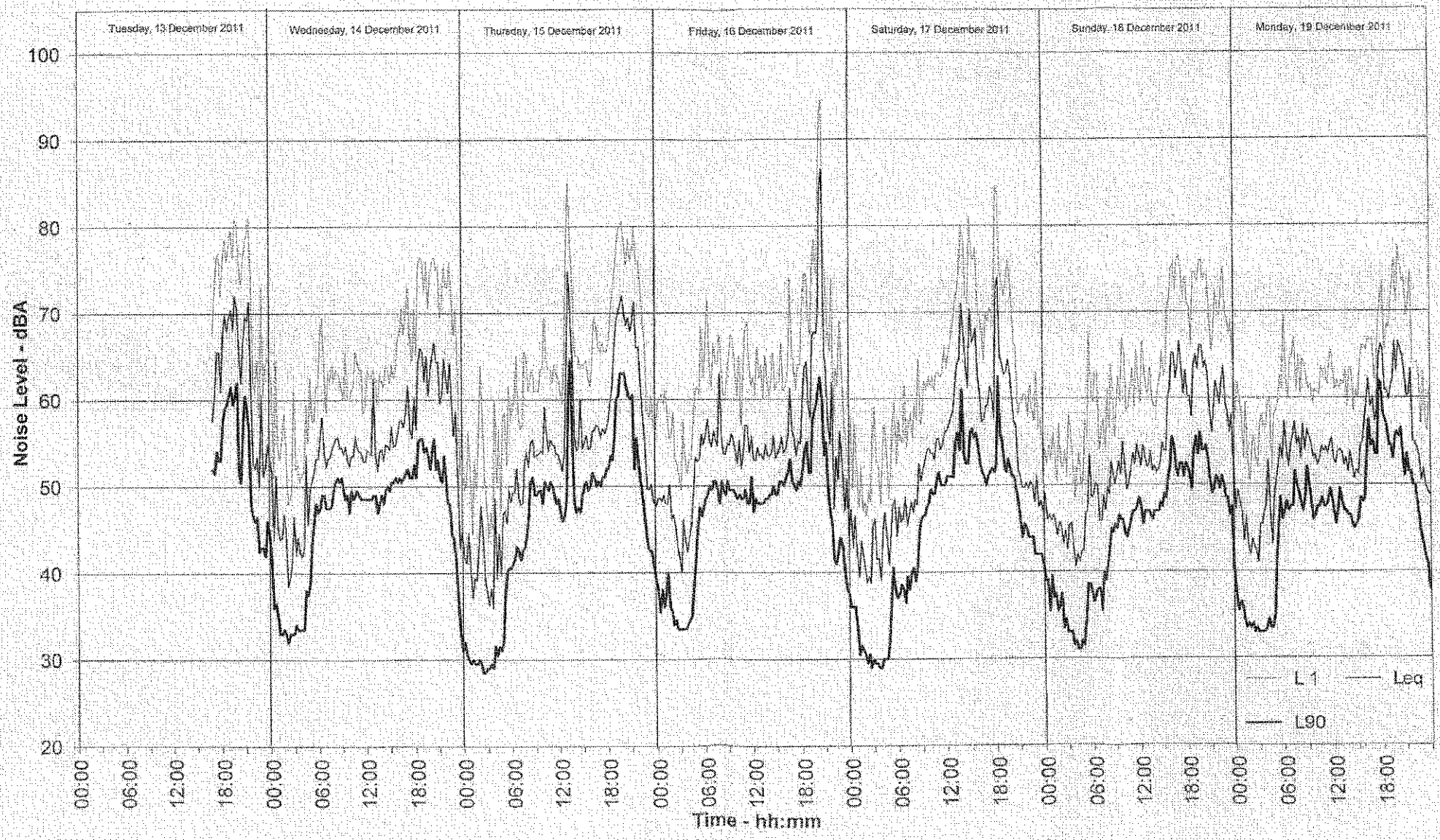
DAY DESIGN	PROPOSED PLACE OF WORSHIP DEVELOPMENT LOCATION PLAN	4744 FIGURE 1



Report 4744
Figure 2

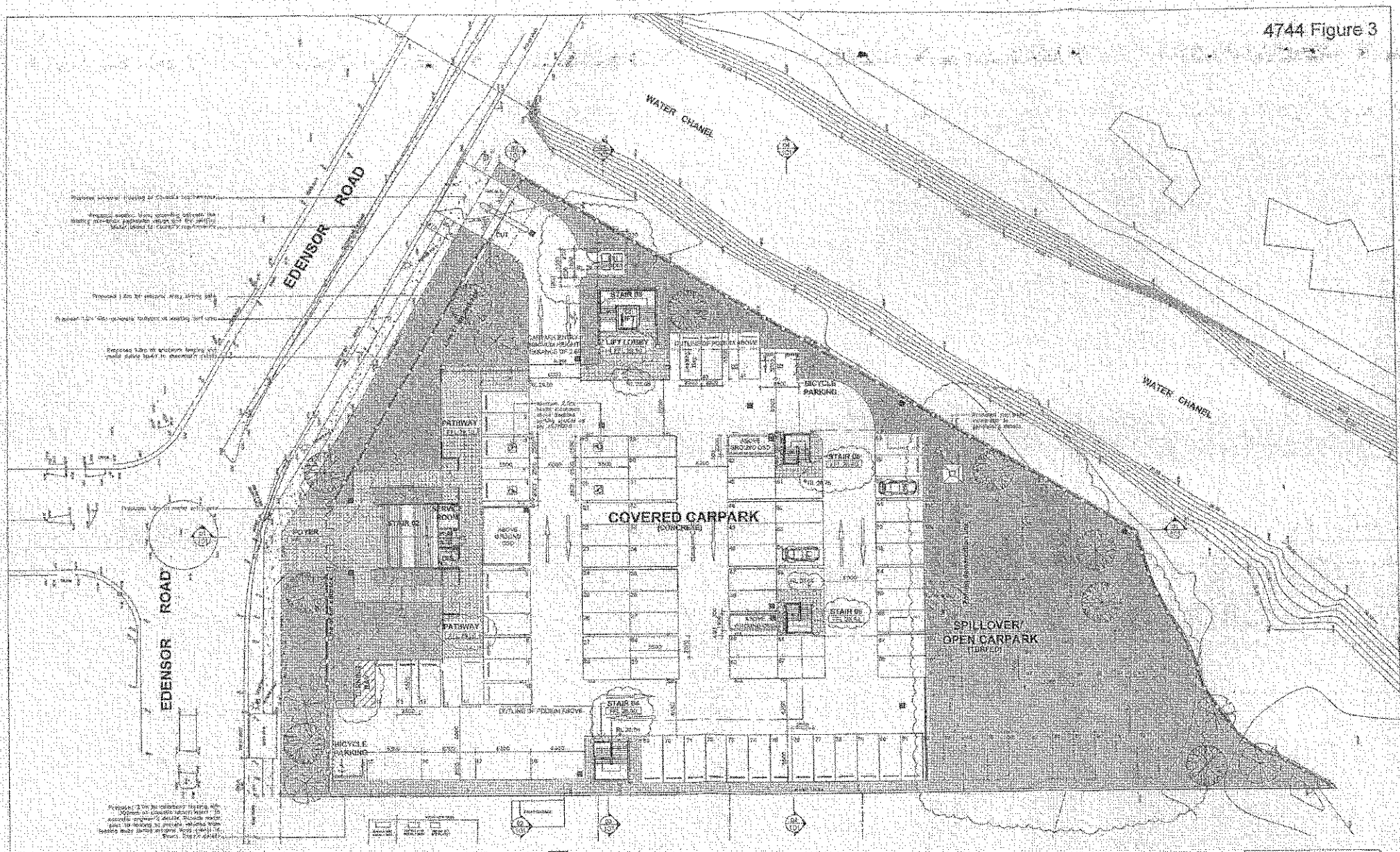
Ambient Noise Survey

Located at 47 Edensor Road, Cabramatta, NSW



DAY DESIGN PTY LTD

4744 Figure 3



01 GROUND FLOOR
1:200

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Date	Amendment	Rev
05.12.12	Issue for DA Submission	A
05.02.13	Amendments to drawing	B

Client:
THE AUSTRALIAN CHINESE TEO CHEW ASSOCIATION INC.
16 Pack Road,
Caboolture NSW2196

Project:
PROPOSED DEMOLITION OF EXISTING BUILDINGS AND PROPOSED STAGE 1 OF PUBLIC WORKS BY COMPRISING OF GROUND PLUS 4 STOREYS, A PEDESTRIAN OVERPASS, TWO (2) BASEMENT CARPARKS, TWO (2) HIGHRISE BUILDINGS AND A LIFT/ STAIR TOWER AND EXTERNAL STAIRCASE
42-51 Edensor Road
Caboolture NSW 2196

Drawing title: GROUND FLOOR PLAN
Date: 05.02.13
Drawn by: KC
Scale: As shown @ A1
Project No: 7417/DA/002
Rev: B