		<p>Decibell Consulting Pty Ltd</p> <p>30 Albert St, Woolloongabba QLD 4102</p> <p>t (07) 3391 5096 f (07) 3391 5096 e decibell@acenet.net.au</p> <p>ABN 77 108 203 998</p>
---	--	---

**Proposed
Material Change of Use – Public Worship,
1 Casuarina Rd,
South MacLean**

**ENVIRONMENTAL
NOISE IMPACT REPORT**

Prepared for

Brisbane Mari Amman Temple

25th June 2012

Report No. 1204490 ver 2.0

*Inquiries about this report should be directed to John Cristaudo at our Brisbane office on
(07) 3391 5096 or email: decibel@acenet.net.au*

1.0 INTRODUCTION

This report is submitted in response to a request by Developthis on behalf of the Brisbane Mari Amman Temple, for an environmental noise impact assessment of proposed Hindu Temple to be located at 1 Casurina Rd, South Maclean. This report seeks form part of a Development Application for consideration by the Logan City Council.

As part of the preparation of this report on site noise logging and attended measurements of ceremonies conducted at an existing Hindu temple were performed. The measurements were then used to predict possible noise impacts from the extensions on the surrounding area. Based upon these predicted noise impacts, recommendations regarding acoustic treatments to the development have been specified.

1.1 The Proposal

The proposal is to construct a Hindu Temple and associated car park on a large site at 1 Casurina Rd, South Maclean. The site is presently used a residential site and has an existing house and barn located on it. These buildings will be retained in the final development.

The proposed temple will be built towards the middle of the existing site with car park between the temple and the Casurina Rd. The size of the temple will be similar in scale to one on the neighbouring site to the south.

The Temple is expected to be open from 7.00 am to early evening seven days a week. “*Pooja*” will be conducted during the morning with additional afternoon ceremonies conducted on Saturdays and Sundays. “*Pooja*” is ceremony involving the temple priest and worshipers making various offerings and prayers. In addition to the prayers and offering as part of the ceremony chimes are sounded at particular moments. However the temple does not use a large bell in the way Christian churches do to summon worshipers, and the ceremony does not included the use of amplified equipment for speech, music or singing.

Typical attendance at a “*Pooja*” will likely vary throughout the week and year. For mid-week ceremonies typically only around half a dozen worshipers are likely to be in attendance, while on weekend these number may increase to around 30-40. However “*festivals*” that likely to be held at the Temple every 1 to 2 months were 50-70 people usually attend.

The area surround the Temple is rural residential land with most residence some distance from the site. The closest of these is on the neighbouring property at 3 Casurina Rd approximately 95 m from the temple.

A site plan and aerial photo are included in the appendix of this report.

2.0 EQUIPMENT

2.1 Ambient Noise Assessment

The following equipment was used to record noise levels at the site:

- Bruel and Kjeaar 4231 Calibrator;
- Larson Davis Environmental Noise Logger;
- Rion NA 27 Sound Level meter;

3.0 MEASUREMENT PROCEDURE

3.1 Logger Noise Measurement

A logger was located along the Casuarina Rd frontage of the neighbouring residence to the temple. This location was chosen as this neighbouring residence represents the closest noise sensitive property to the site with the next residence at the rear of the site some distance away. The location of the logger is indicated on the aerial photograph of the site included in the appendix to the report.

The logger was set to record noise statistics in 15 minute blocks continually over the measurement period (Friday 22/06/12 to Monday 25/06/12). The statistical interval was chosen to allow application of AS/NZS 2107:2000 '*Acoustics – Recommended Design Sound Level and Reverberation Times for Building Interiors*'.

Measurement of ambient noise levels were conducted generally in accordance with Australian Standard AS1055.1 - 1997 '*Acoustics - Methods for the measurement of environmental noise*'.

The operation of the sound level measuring equipment was field calibrated before and after the measurement session and was found to be within 0.1 dB of the reference signal. All instrumentation used in this assessment hold current calibration certificate from a certified NATA calibration laboratory.

Weather conditions during the survey were fine, with temperatures ranging from 8° C to 25° C over the measurement period. Winds were light over this same period.

3.2 On Site Noise Measurement

On site measurements were conducted at the neighbouring Hindu Temple on the morning of the 4th November 2009. Measurements were conducted during a morning *Pooja* (Hindu Ceremony). All measurements were conducted generally in accordance with Australian Standard AS1055 1997 "*Acoustics – Description & Measurement of Environmental Noise*".

4.0 NOISE CRITERIA

4.1 Noise Associated with On-site Activities

Developments such as the proposed Temple falling within the previous boundaries of the Beaudesert Shire are assessed against *Division 23 Public Worship Code* of the previous *Beaudesert Shire Planning Scheme*. The objective of this code is that:

“5.2.69 Overall Outcomes for Public Worship Code

Public Worship is the Provision of conveniently located facilities to enable Public Worship whilst maintaining the amenity of the surrounding area.”

In order to maintain the amenity of the surrounding area in relation to noise emissions from a proposed Public Worship facility the following Specific Outcome is provided for under the Code:

“SO4 – Development provides that noise emissions from the site do not cause annoyance or disturbance.”

However the Code does not provide *Probable Solutions* or specific assessment criteria relating to noise emissions. In order to assess noise emissions from the proposed development reference will be made to *Table 1.1, Schedule 3 of the Logan Planning Scheme 2006*. This table relates to noise emission and immission standards and has been reproduced below:

Column 1 Time	Column 2 Noise Sensitive Place	Column 3 Non-Noise Sensitive Place
Noise Emission Standards		
7.00 am – 6.00 pm	$L_{Amax,adj T} < = L_{Abg} + 5 \text{ dB(A)}$	$L_{Amax,adj T} < = L_{Abg} + 10 \text{ dB(A)}$
6.00 pm – 10.00 pm	$L_{Amax,adj T} < = L_{Abg} + 5 \text{ dB(A)}$	$L_{Amax,adj T} < = L_{Abg} + 10 \text{ dB(A)}$
10.00 pm – 7.00 am	$L_{Amax,adj T} < = L_{Abg} + 3 \text{ dB(A)}$	$L_{Amax,adj T} < = L_{Abg} + 8 \text{ dB(A)}$
Noise Immissions Standards		
10.00 pm – 7.00 am (general sleep disturbance criteria)	<p>Maximum Levels –</p> <ul style="list-style-type: none"> • Inside bedroom – $L_{Aeq} \text{ dB(A)} = 30; L_{Amax} = 45 \text{ dB (A)}$. • Outside bedroom - $L_{Aeq} \text{ dB(A)} = 45; L_{Amax} = 60 \text{ dB (A)}$. 	Not Applicable.

Table 1.1: Noise emission and Immission Standards

5.0 RESULTS & CALCULATIONS

5.1 Background & Ambient Noise

Background and ambient noise levels were recorded at the site. Table 1 below presents measured averaged background noise levels (L_{90}^1), and intrusive noise (L_{10}^2) levels at this location.

Date		Sound Pressure Level SPL dB(A)		Noise Criteria $LA_{90} + 5$
		LA_{90}	LA_{10}	
Friday 22/06/12	Day (7.00 am – 6.00 pm)	47	52	52
	Evening (6.00 pm – 10.00 pm)	42	48	47
Saturday 23/06/12	Day (7.00 am – 6.00 pm)	43	49	48
	Evening (6.00 pm – 10.00 pm)	40	46	45
Sunday 24/06/12	Day (7.00 am – 6.00 pm)	44	43	48
	Evening (6.00 pm – 10.00 pm)	39	47	44
Monday 25/06/12	Day (7.00 am – 6.00 pm)	44	43	49

Table 1: Measured noise levels on-site and applicable noise limit criteria for a Noise Sensitive Place.

The noise limit criteria presented in the above table relate to measured corrected limits, where corrections must be applied to allow for tonal or impulsive characteristics as per Australian Standard AS 1055.

5.2 On Site Activities

5.2.1 Ceremonial Activities

Measurements conducted of a “Pooja” taking place in the Hindu Temple in the existing neighbouring temple on the morning of the 4th November 2009. In attendance at the “Pooja” were the temple priest and six worshipers. Measurements were made while prayers were said during offerings and when the chimes used in the ceremony were sounded. The results of these measurements are recorded in the table below.

Noise Source	Measured Level SPL @ 5m	Correction SPL dB(A)*	Corrected Level SPL
Chime/bell	64 dB L_{Amax}	+ 5 (impulsive)	69 dB L_{Amax}
Priest and six worshipers involved in “pooja” Ceremony	63 dB L_{Amax}	0	63 dB L_{Amax}

Table 2: Measured Noise levels from “Pooja” Ceremony
* As required by AS 1055

¹ The L_{90} level, or the level exceeded for 90% of a measurement period is often used to describe background noise.

² L_{10} level is the level exceeded for 10% of the measurement time, and often termed the “average maximum”

These measured noise levels have firstly been used to model the likely noise levels produced by a group of seventy worshipers (such as would be involved in a "festival") and then the impact of this large group on the neighbouring residence at 3 Casurina Rd. The results of this modelling have been included in the appendix in the table below. Further details of the calculations used to model impacts on this residence are also included in the appendix to this report.

Noise Source	Predicted Façade Noise Impact Level Neighbouring Residence at 3 Casurina Rd L_{Amax}
Chime/bell	39
Priest and seventy worshipers involved in "pooja" Ceremony	44

Table 3: Predicted Noise levels at the Neighbouring Residence

5.2.2 Car Parking Activities

As part of the construction of the Temple a car park will be established at the Casurina Rd entry to the site. Table 4 below presents source noise levels (corrected for impulsiveness or tonality as per AS1055), and predicted noise impact levels from on-site vehicle movements impacting onto the nearest adjacent residential. The nearest residential dwelling to the development is the neighbouring dwelling at 3 Casurina Rd. The location of this residence is shown on the aerial photograph of the site included in the appendix to this report. Further details of the calculations used to model impacts on this residence are also included in the appendix to this report.

Noise Source	Corrected Source Level @ 1m L_{Amax}	Predicted Façade Noise Impact Level Neighbouring Residence L_{Amax}
Car door closure	80	42
Car idling in car park	74	36
Car by pass on driveway	78	40
Car Start up	79	41
Talking in Car Park	72	34

Table 4: Predicted corrected noise levels associated with on site activities from car parking

5.2.3 Volley Ball Court

A volley ball court will also be established for social play on the northern side of the site. It is not intended that the court would be open for organized competitive volley ball. Spectators would only also be limited. The table below presents the source noise level relating to measurements conducted on a volley ball game played at OZ Sports Springwood.

Noise Source	Measured Level SPL @ 1m	Correction SPL dB(A)*	Corrected Level SPL
Player Hitting Volley Ball	73 dB L_{Amax}	+ 5 (impulsive)	78 dB L_{Amax}
Players Talking on Court	72 dB L_{Amax}	0	72 dB L_{Amax}
Umpire Calling Decisions	80 dB L_{Amax}	0	80 dB L_{Amax}

Table 5: Measured Noise levels from Volley Ball Game

These measured noise levels above have been used to model the likely noise levels produced by a volley ball game on neighbouring residence at 3 Casurina Rd. The results of this modelling have been included in the appendix in the table below. Further details of the calculations used to model impacts on this residence are also included in the appendix to this report.

Noise Source	Predicted Façade Noise Impact Level Neighbouring Residence at 3 Casurina Rd L_{Amax}
Player Hitting Volley Ball	37
Players Talking on Court	31
Umpire Calling Decisions	39

Table 6: Predicted Noise levels at the Neighbouring Residence from Volley Ball Game

6.0 RECOMMENDED ACOUSTIC TREATMENTS

6.1 Noise from On Site Activities

Activities at the Temple only occur during the *day* and evening periods (as defined by AS 1055). So modelling from Section 5.1 of this report of noise impacts from the site has only be has compared to the criteria noise levels for *day* and *evening* periods determined in accordance with *Table 1.1, Schedule 3 of the Logan Planning Scheme 2006*. If this is done it can be seen that no noise impacts associated with the Temple, volley ball court and car park will exceed the noise criteria levels. However it is recommended that the hours of operation of the temple be limited to the period i.e. between 7.00 am to 6.00 pm on weekends (i.e. Saturday and Sunday) to minimize any possible adverse noise impacts on the surrounding area. The Temple would still operate into the evening during the week.

7.0 DISCUSSION & CONCLUSIONS

Noise from on site activities associated with the ceremonies likely to be conducted at the Temple and car parking has been considered in this report. Noise impacts from chimes/bell and other activities associated with the ceremonies conducted in the Temple, the volley ball court, car parking, and on site vehicle manoeuvring were modelled. Noise impacts from all these activities were found be below the criteria from the *Table 1.1, Schedule 3 of the Logan Planning Scheme 2006* for the *Day* and *Evening* period and to meet the requirements of the *Public Worship Code*. However to minimize any possibility of adverse noise impacts on the surrounding area it has been recommended to limit the hours of operation of the Temple on weekends to 7.00 am to 6.00 pm. The Temple still though operate on week day evenings.

Based upon our calculations Decibell Consulting believe that the development will comply with *Logan City Planning Scheme* and should be approved.

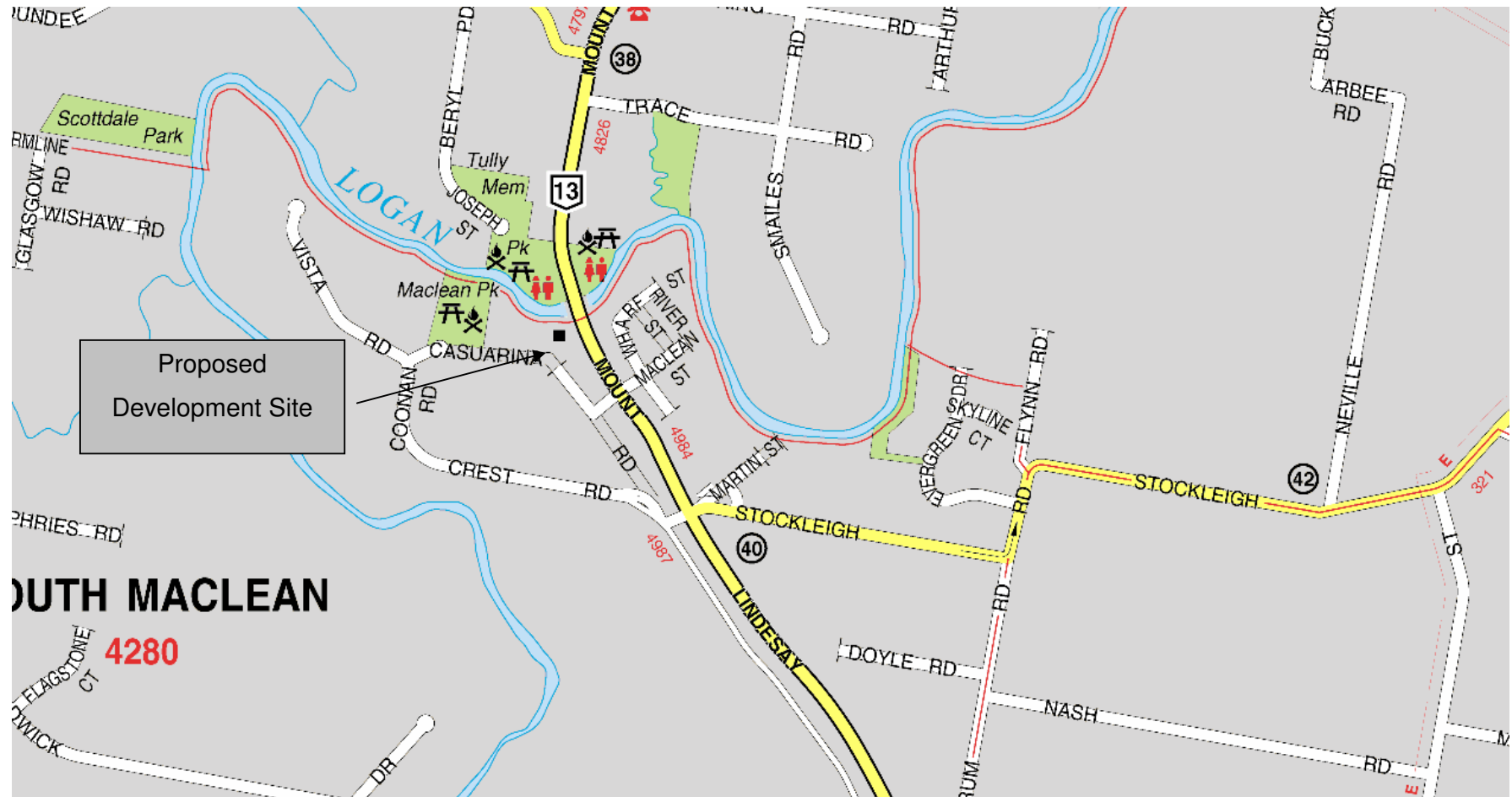
Report Compiled by:



John Cristaudo
Acoustic Consultant
Decibell Consulting

APPENDIX

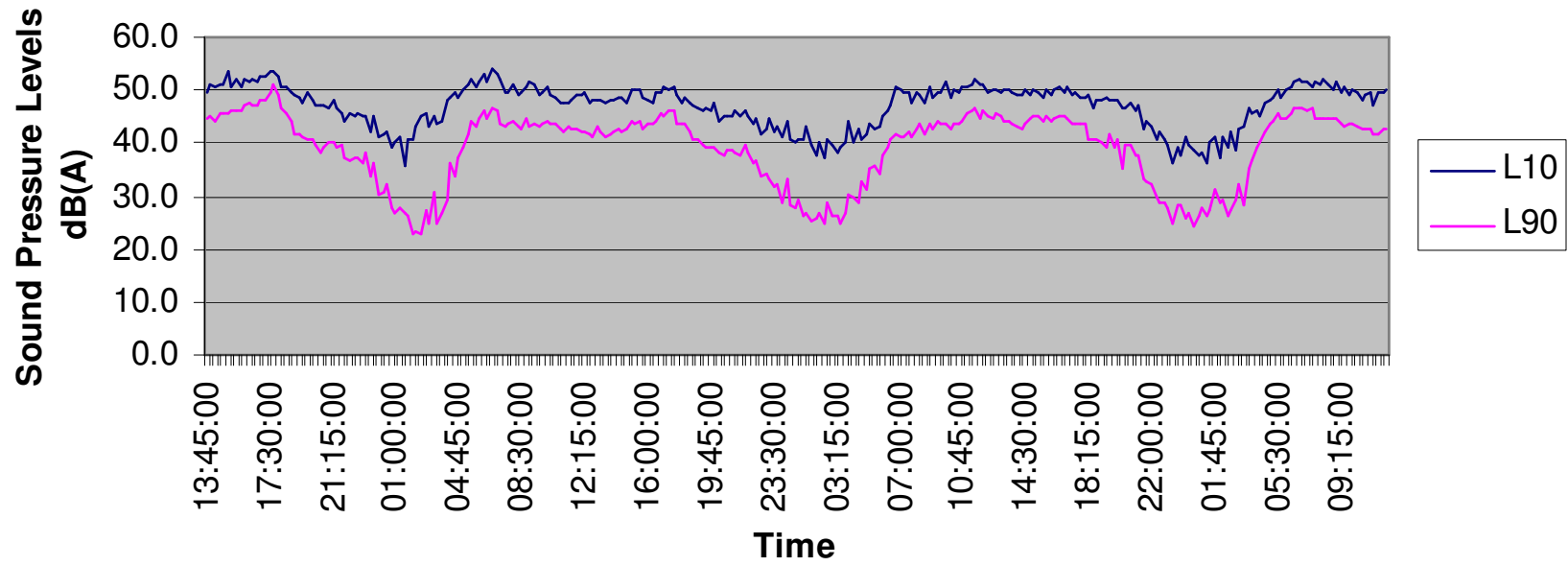
**Proposed Development Site Sketch No. 1
PLAN VIEW**

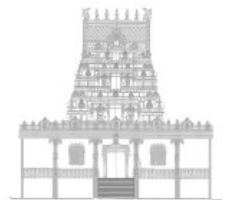
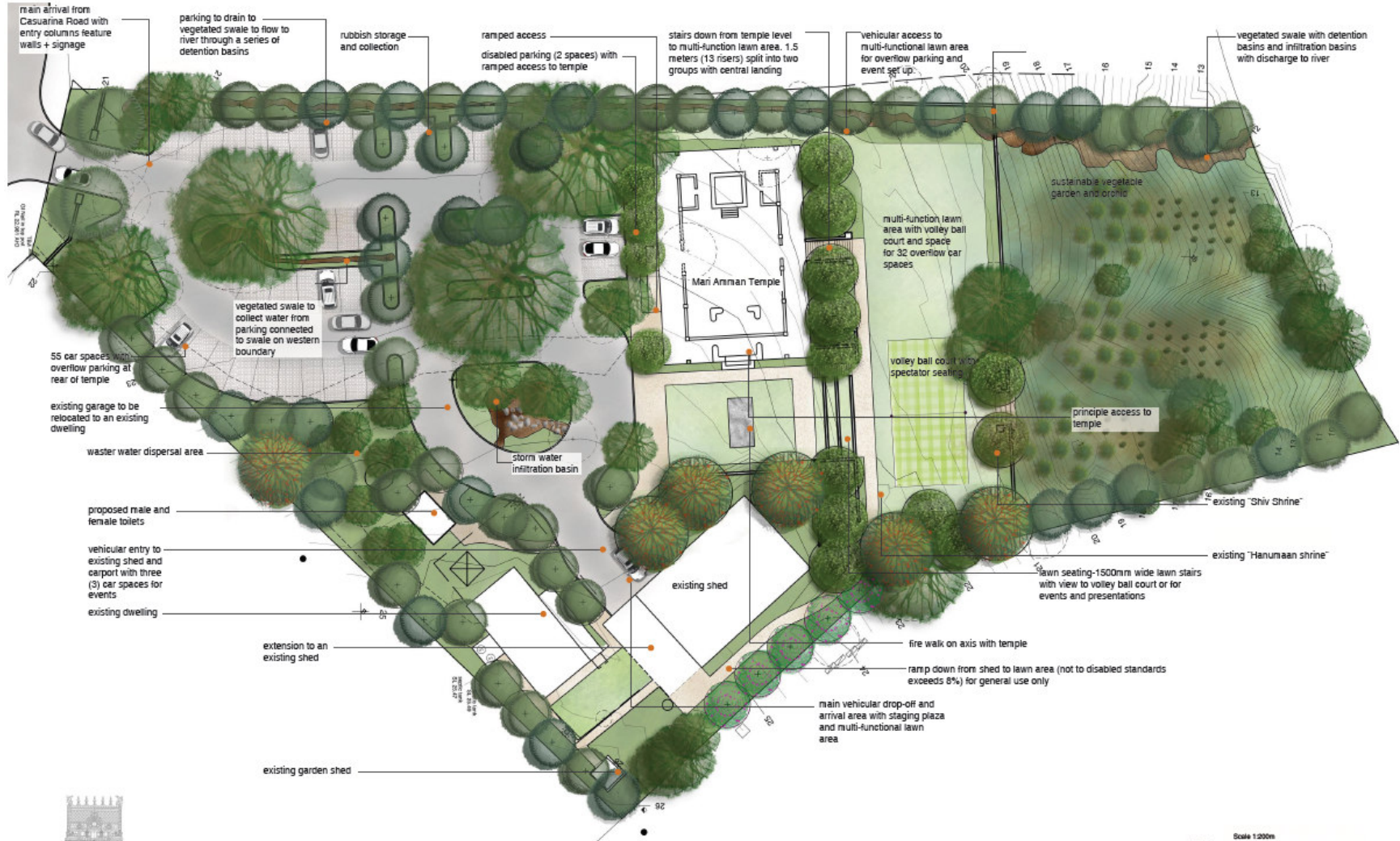


**Proposed Development Site Sketch No. 2
Aerial Photograph**



Ambeint Noise Levels





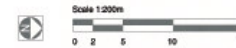
ॐ

BRISBANE MARI AMMAN TEMPLE
 ONE CASUARINA ROAD | SOUTH MACLEAN | LOGAN CITY
 PRELIMINARY CONCEPTUAL MASTER PLAN

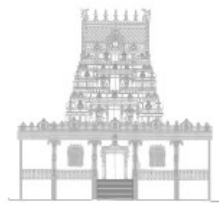
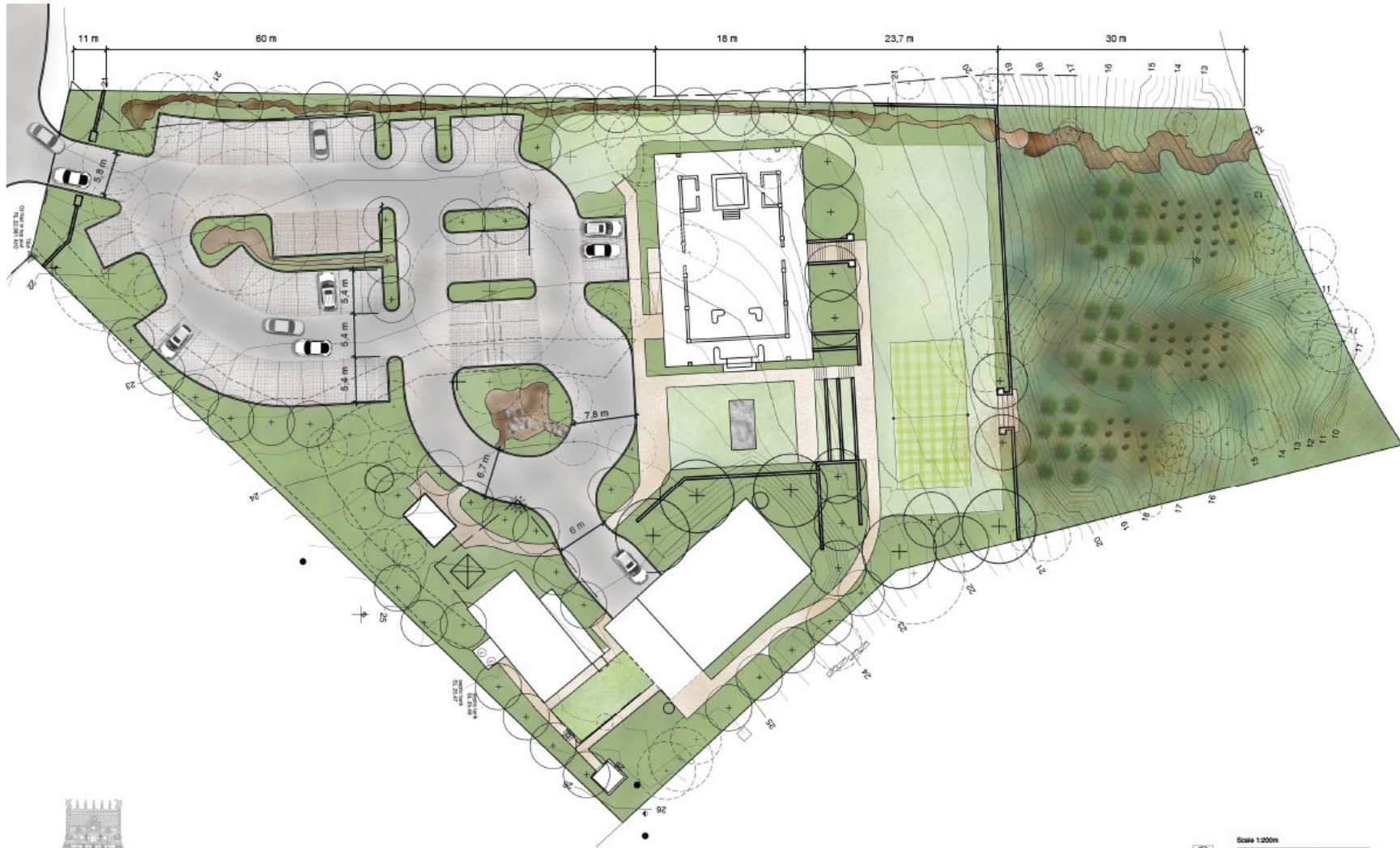


PREPARED BY:
VIDA
 DESIGNING FOR LIFE
 LANDSCAPE ARCHITECTURE + PLANNING

DEVELOP THIS
 PROPERTY DEVELOPMENT CENTRE



DATE: FEBRUARY 2018

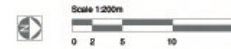


ಶ್ರೀ ಮಠ

BRISBANE MARI AMMAN TEMPLE
 ONE CASUARINA ROAD | SOUTH MAOLEAN | LOGAN CITY
 PRELIMINARY CONCEPTUAL MASTER PLAN



PREPARED BY:
VIDA
 DESIGNING FOR LIFE
 LANSBORO 96011010-6-FARMER



DATE: FEBRUARY 2010

Point Source Noise Calculations

**Noise Impacts on Residence at 3
Casuarina**

Point Source Calculations	
Pooja Ceremony with six worshipers	63 at 5m
Pooja Ceremony with seventy worshipers	71 at 5m
Distance to Receiver	115 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-27.2 dB(A)
Open Window Attenuation	-5.0 dB(A)
Level at Façade	44 dB(A)

Point Source Calculations	
Chime/bell	69 at 5m
Distance to Receiver	115 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-27.2 dB(A)
Open Window Attenuation	-5.0 dB(A)
Level at Façade	39 dB(A)

Point Source Noise Calculations

Noise Impacts on Residence at
3 Casurina Rd

Point Source Calculations	
Car Idling in Car park	74 at 1m
Distance to Receiver	104 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-40.3 dB(A)
Level at Façade	36 dB(A)
Point Source Calculations	
Car by pass @ 5 km/hr	78 at 1m
Distance to Receiver	108 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-40.6 dB(A)
Level at Façade	40 dB(A)

Point Source Calculations	
Car Door Closure	80 at 1m
Distance to Receiver	104 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-40.3 dB(A)
Level at Façade	42 dB(A)
Point Source Calculations	
Car start Up	79 at 1m
Distance to Receiver	104 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-40.3 dB(A)
Level at Façade	41 dB(A)
Point Source Calculations	
Talking in Car Park	72 at 1m
Distance to Receiver	104 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-40.3 dB(A)
Level at Façade	34 dB(A)

Point Source Noise Calculations

Noise Impacts on Residence at
3 Casurina Rd

Point Source Calculations	
Player Hitting Volley Ball	78 at 1m
Distance to Receiver	150 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-43.5 dB(A)
Level at Façade	37 dB(A)
Point Source Calculations	
Players Talking on court	72 at 1m
Distance to Receiver	150 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-43.5 dB(A)
Level at Façade	31 dB(A)

Point Source Calculations	
Umpire Calling Decisions	80 at 1m
Distance to Receiver	150 m
Façade Reflection	2.5 dB(A)
Distance Reduction	-43.5 dB(A)
Level at Façade	39 dB(A)