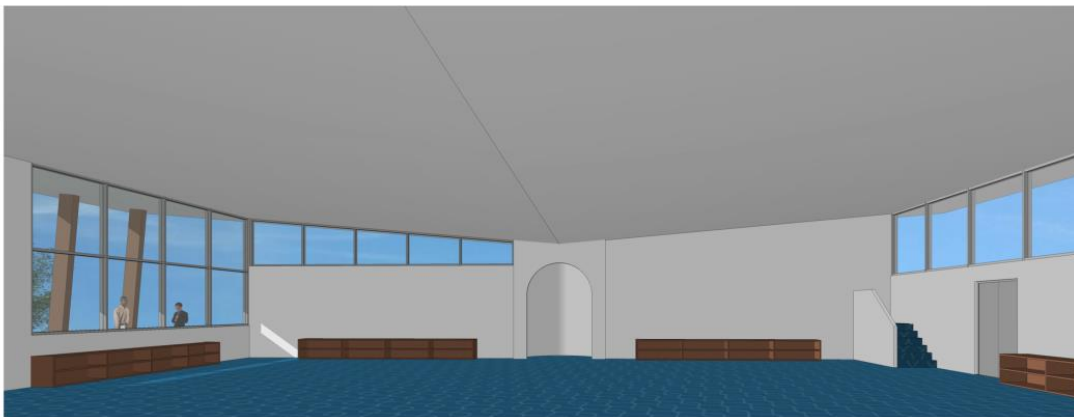






EXTERNAL VIEW



INTERNAL VIEW

DRAWING LIST

- TP01 COVER PAGE
- TP02 SITE PLAN
- TP03 GROUND FLOOR
- TP04 ELEVATIONS & SECTIONS
- TP05 OVERALL SITE PLAN

DEVELOPMENT SUMMARY

ENTRY VERANDAHS: 170 m<sup>2</sup>  
 PRAYING AREA: 400 m<sup>2</sup>  
 AMENITIES: 123 m<sup>2</sup>  
 TOTAL BUILT AREA: 693 m<sup>2</sup>

SITE AREA: 2.209HA

SITE COVERAGE: 0.66%

PLACE OF WORSHIP,  
 171-179 HARKNESS ROAD,

TOWN PLANNING

#.	AMENDMENT	DATE
A	VCAT Conditions	15.10.2018

PROJECT:  
 PLACE OF WORSHIP  
 171-197 HARKNESS ROAD  
 MELTON WEST

DRAWING:  
 COVER PAGE

Contractors must verify all dimensions on site before commencing any work or preparing shop drawings.  
 ©COPYRIGHT

CREATION DATE:

JUNE 2019

JOB NO:

17-088

SCALE:

@A1

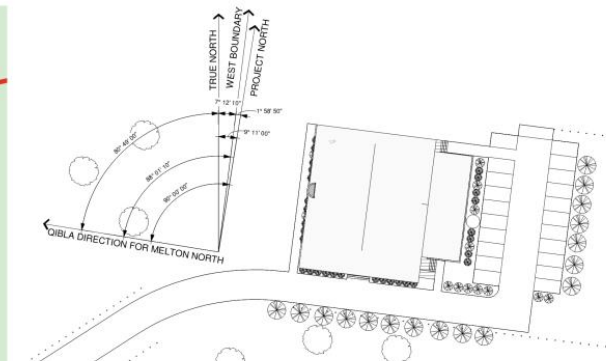
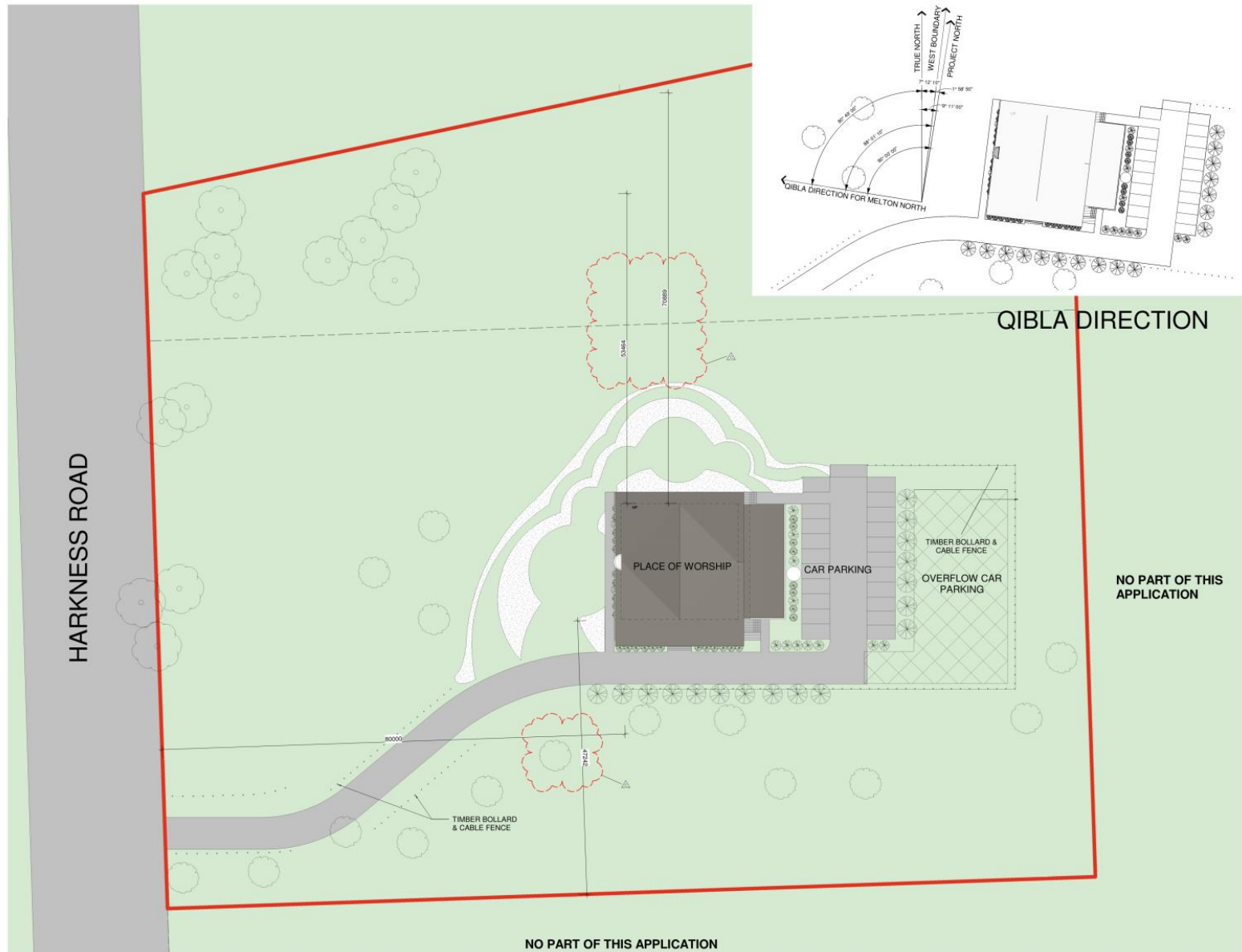
AUTHOR:

SA

**Finnis Architects**

72 Bridport Street, Albert Park, 3206  
 P | +613 9948 9900 F | +613 9990 2291

DRAWING NO:  
**TP01**  
 REV:  
**A**



TOWN PLANNING

#.	AMENDMENT	DATE
A	VCAT Conditions	15.10.2018
B	Title Re-Alignment	07.06.2019
C	Building relocation	06.10.2019

PROJECT:  
PLACE OF WORSHIP  
171-197 HARKNESS ROAD  
MELTON WEST

DRAWING:  
SITE PLAN

Contractors must verify all dimensions on site before commencing any work or preparing shop drawings.  
©COPYRIGHT



CREATION DATE:  
JANUARY 2018

JOB NO:  
17-088

SCALE:  
AS INDICATED @A1

AUTHOR:  
SA



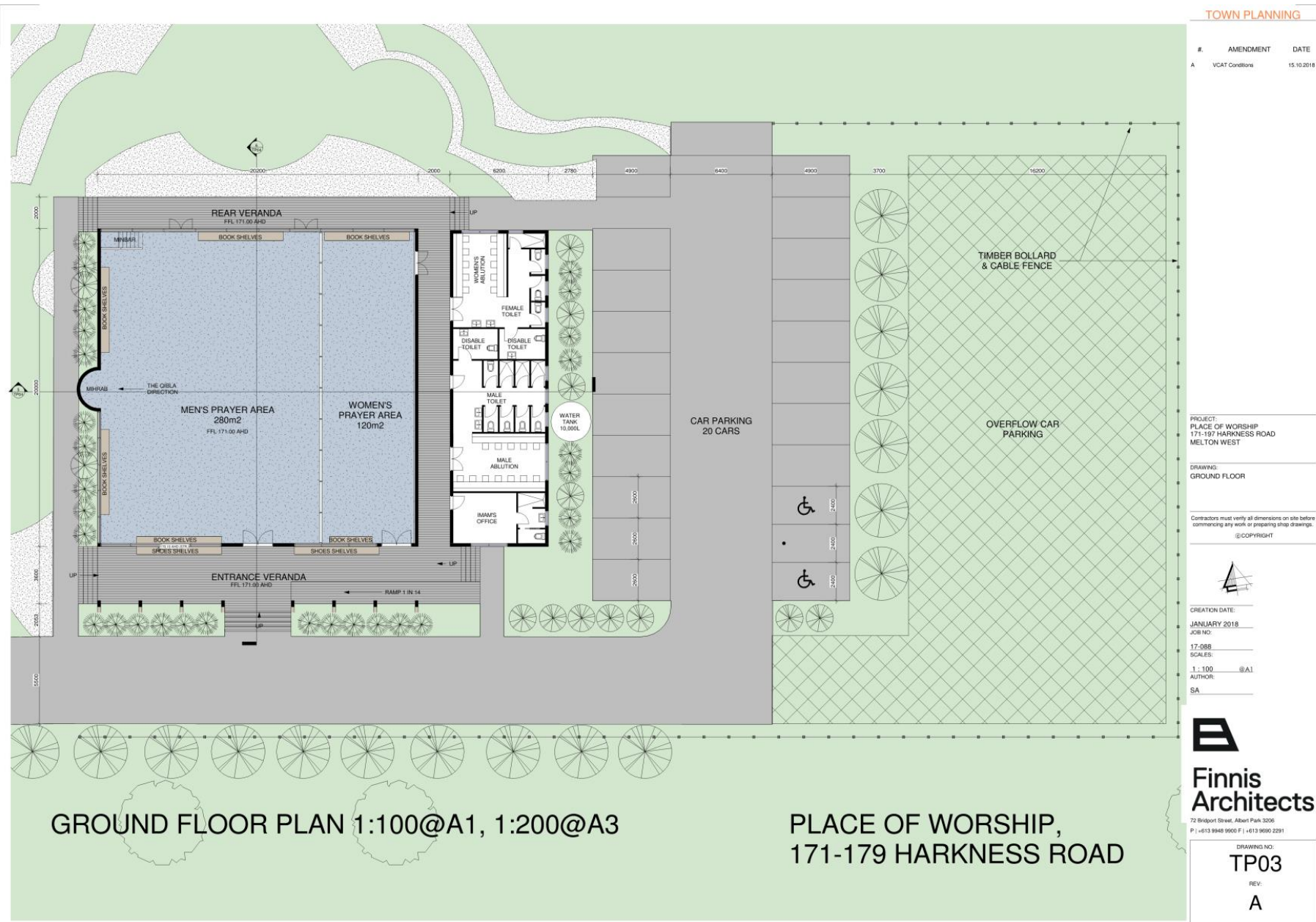
72 Bridport Street, Albert Park, 3206  
P | +613 9948 9900 F | +613 9990 2291

DRAWING NO: <b>TP02</b>
REV: <b>C</b>

SITE PLAN 1:300@A1, 1:600@A3

PLACE OF WORSHIP, 171-179 HARKNESS ROAD





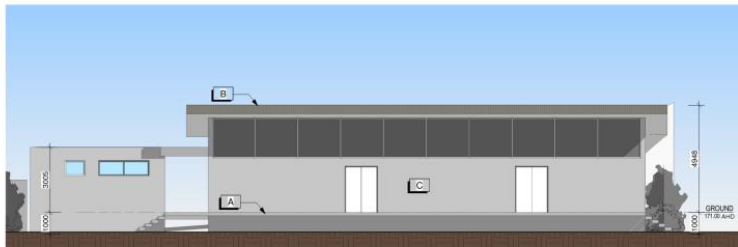




EAST  
1:100



WEST  
1:100



NORTH  
1:100



SOUTH  
1:100



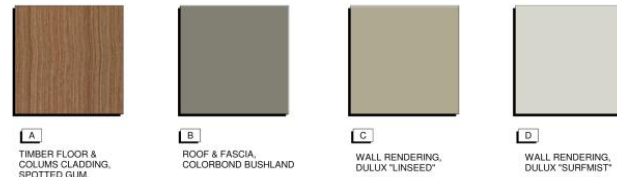
Section 1  
1:100

APPROXIMATE GROUND LEVEL 170.00 AHD



Section 2  
1:100

APPROXIMATE GROUND LEVEL 170.00 AHD



EXTERNAL FINISHES LEGEND

ELEVATIONS & SECTIONS  
1:100@A1, 1:200@A3

PLACE OF WORSHIP,  
171-179 HARKNESS ROAD

TOWN PLANNING

#.	AMENDMENT	DATE
A	VCAT Conditions	15.10.2018

PROJECT:  
PLACE OF WORSHIP  
171-197 HARKNESS ROAD  
MELTON WEST

DRAWING:  
ELEVATIONS & SECTIONS

Contractors must verify all dimensions on site before commencing any work or preparing shop drawings.  
©COPYRIGHT

CREATION DATE:  
JANUARY 2018

JOB NO:

17-088

SCALE:

As indicated

AUTHOR: @A1

SA

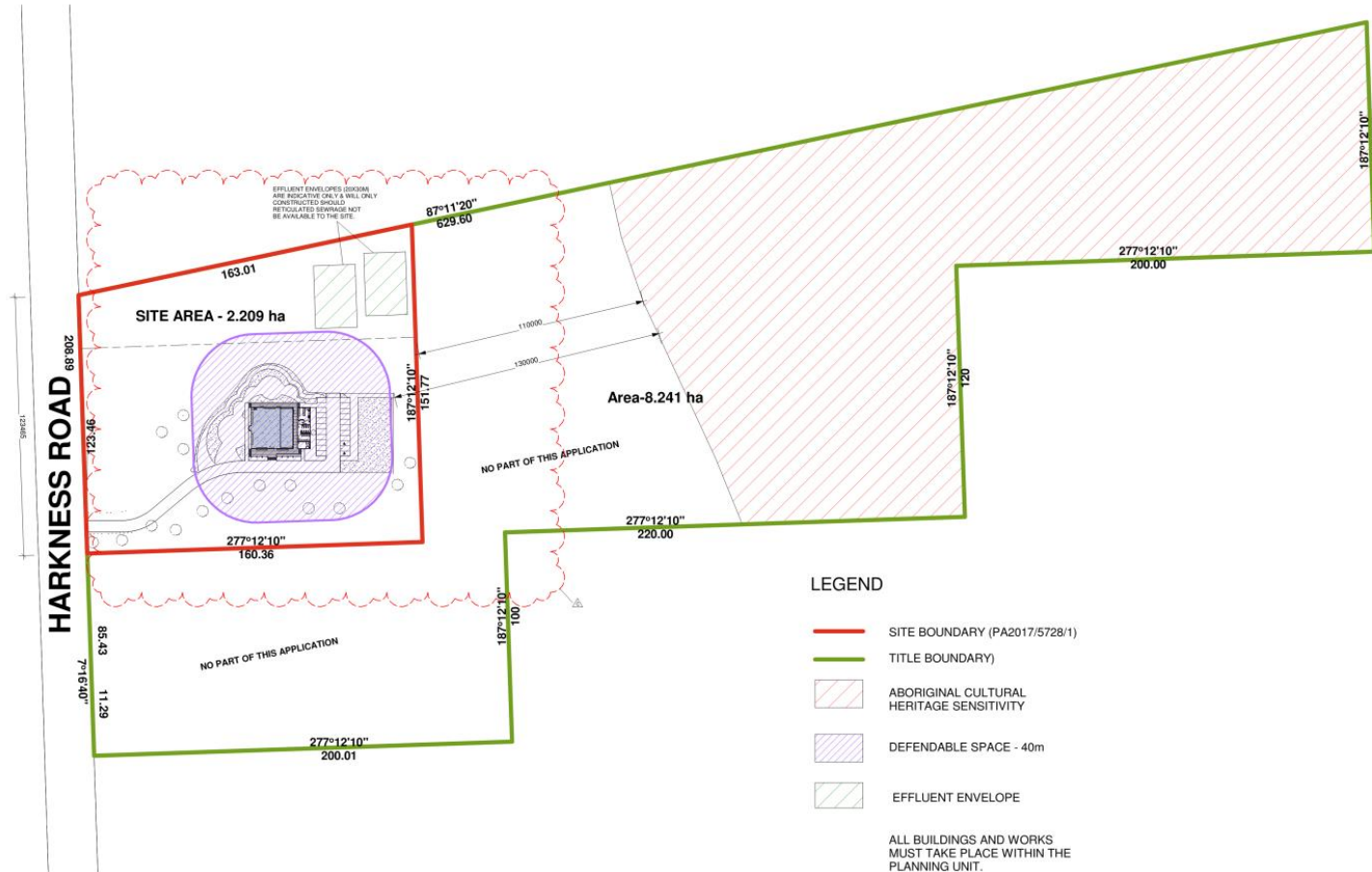


72 Bridport Street, Albert Park, 3206  
P | +613 9948 9900 F | +613 9990 2291

DRAWING NO: <b>TP04</b>
REV: <b>A</b>

TOWN PLANNING

#.	AMENDMENT	DATE
A	VCAT Conditions	15.10.2018
C	Building relocation	08.10.2019



OVERALL SITE PLAN 1:1000

LEGEND

- SITE BOUNDARY (PA2017/5728/1)
- TITLE BOUNDARY
- ABORIGINAL CULTURAL HERITAGE SENSITIVITY
- DEFENDABLE SPACE - 40m
- EFFLUENT ENVELOPE

ALL BUILDINGS AND WORKS MUST TAKE PLACE WITHIN THE PLANNING UNIT.

NO BUILDINGS AND WORKS ARE TO OCCUR ON THE BALANCE OF THE SITE.

PROJECT:  
PLACE OF WORSHIP  
171-197 HARKNESS ROAD  
MELTON WEST

DRAWING:  
OVERALL SITE PLAN

Contractors must verify all dimensions on site before commencing any work or preparing shop drawings.  
©COPYRIGHT

CREATION DATE:  
10/15/18

JOB NO:  
17-088

SCALES:  
1 : 1000 @A1

AUTHOR:  
SA

**Finnis Architects**

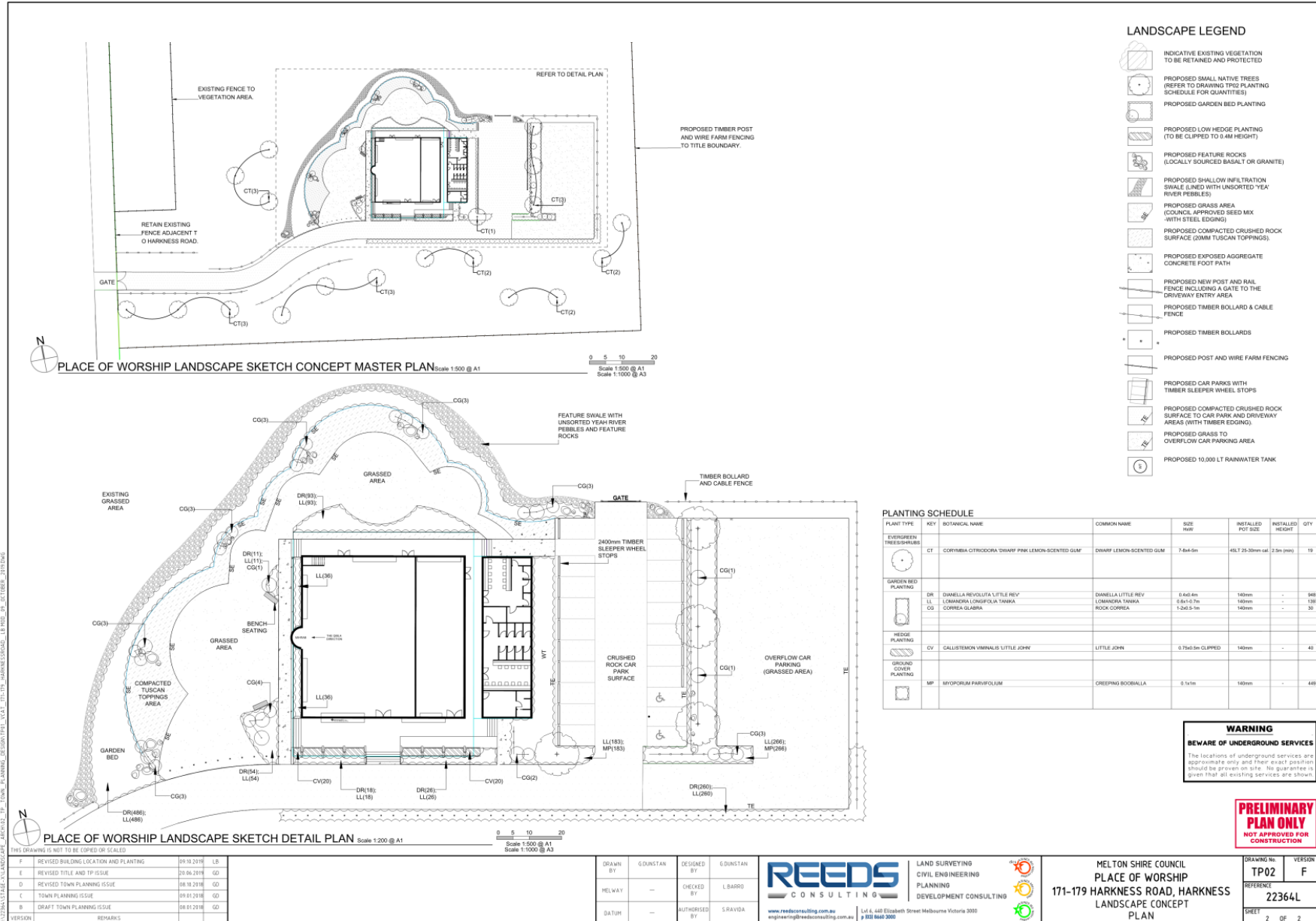
72 Bridport Street, Albert Park, 3206  
P | +613 9948 9900 F | +613 9990 2291

DRAWING NO:  
**TP05**

REV:  
**C**









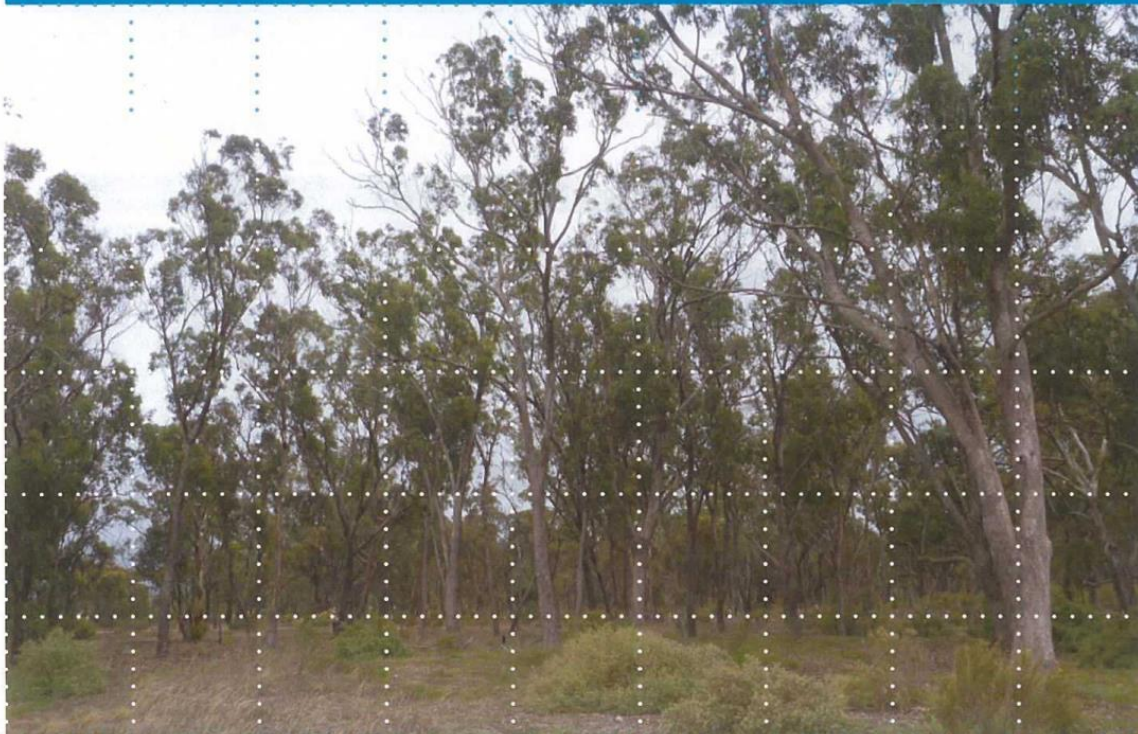
Final Report

# Land Management Plan: 171-197 Harkness Road, Harkness

Prepared for

**Melbourne Islamic Centre Limited**

October 2019



**Ecology and Heritage Partners Pty Ltd**

MELBOURNE: 292 Mt Alexander Road Ascot Vale VIC 3056 GEELONG: PO Box 8048 Newtown VIC 3220  
BRISBANE: Level 22, 127 Creek Street Brisbane QLD 4000 ADELAIDE: 8 Greenhill Road Wayville SA 5034  
CANBERRA: PO Box 6067, O'Connor ACT 2602 SYDNEY: level 5, 616 Harris Street, Ultimo, NSW, 2007:



## DOCUMENT CONTROL

Assessment	Land Management Plan
Address	171-197 Harkness Road, Harkness
Project number	12730
Project manager	Cat Stephenson (Senior Bushfire Consultant / Botanist)
Report Author	Cat Stephenson
Report reviewer	Robyn Neville (Senior Botanist)
Other EHP staff	N/A
Mapping	Petra Sorenson (GIS Officer)
File name	12730_EHP_LMP_171-197 Harkness Road-Harkness_Final_2019-10-04v2
Client	Melbourne Islamic Centre Limited
Bioregion	Victorian Volcanic Plains
CMA	Port Phillip and Western Port
Council	City of Melton

Report versions	Comments	Date submitted
Draft	Report sent to client	29/07/2019
Final	Report sent to client – minor changes	30/07/2019
Final	Report sent to client – changes to the development plan on Figure 2	04/10/2019

**Copyright © Ecology and Heritage Partners Pty Ltd**

This document is subject to copyright and may only be used for the purposes for which it was commissioned. The use or copying of this document in whole or part without the permission of Ecology and Heritage Partners Pty Ltd is an infringement of copyright.

**Disclaimer**

Although Ecology and Heritage Partners Pty Ltd have taken all the necessary steps to ensure that an accurate document has been prepared, the company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report and its contents.





**CONTENTS**

**1 INTRODUCTION ..... 4**

    1.1 Background..... 4

    1.2 Land Management Plan Objectives..... 5

    1.3 Study Area ..... 5

    1.4 Land Use ..... 6

**2 EXISTING CONDITIONS ..... 7**

    2.1 Current study area condition..... 7

    2.2 Significance Assessment..... 9

        2.2.1 Flora ..... 9

        2.2.2 Fauna ..... 9

**3 LAND MANAGEMENT PLAN ..... 11**

    3.1 Management Issues..... 11

        3.1.1 Remnant Vegetation to be Removed ..... 11

        3.1.2 Weeds..... 11

        3.1.3 Protection of Remnant Vegetation..... 13

        3.1.4 Pest Animals ..... 13

    3.2 Management Actions ..... 13

        3.2.1 Weed Control..... 13

        3.2.2 Fencing..... 15

        3.2.3 Pest Animals ..... 15

        3.2.4 Landscape Planting..... 17

    3.3 Responsibilities and Timeframes..... 17

**4 REFERENCES ..... 19**

**5 FIGURES ..... 20**

**APPENDIX 1: WEED CONTROL MEASURES ..... 23**



## 1 INTRODUCTION

---

### 1.1 Background

Ecology and Heritage Partners Pty Ltd was engaged by Melbourne Islamic Centre Limited to prepare a Land Management Plan (LMP) for 171-197 Harkness Road, Harkness (Figure 1). A Planning Permit (PA2012/3458, issued by the City of Melton) was issued on 13 July 2012 that allowed for the use and development of the land for the purpose of a Place of Worship with associated car parking. This permit has since lapsed, and the study area reduced to stay outside the Aboriginal Cultural Heritage Sensitivity layer that was placed over the eastern half of the original study area land after the planning permit lapsed (Figure 2). This LMP assumes that the same planning permit approval requirements issued under Conditions 2 and 32 of the previous Planning Permit (PA2012/3458) still apply, which ensures that the land is managed appropriately in the long-term.

#### Condition 2 of Planning Permit (PA2012/3458):

Before the use and/or development starts, the owner must enter into an agreement with Council made pursuant to Section 173 of the *Planning and Environment Act 1987* to provide for the following:

- a. Prior to commencement of works, the patch of trees in the north-east corner of the property must be permanently fenced with secure and obvious fencing to the drip line plus 5 metres. Fencing must be signposted as 'tree protection zone'. Fill, machinery and building materials must not be placed, even for a short time, within the tree protection zone.
- b. At the completion of works, nothing, including vehicles, is to be stored under the canopy of any existing remnant trees or on areas of native vegetation.
- c. Environmental weeds as referred to in Department of Sustainability and Environment *Advisory list of environmental weeds of the Inland Plains bioregions of Victoria*, May 2009 must not be planted on the subject land.
- d. All native vegetation to be retained onsite must be fenced at a distance of at least two metres or 12 times diameter at breast height (whichever is greater), to ensure that public access is not permitted.
- e. The Land Management Plan endorsed under the planning permit must be implemented to the satisfaction of the Responsible Authority.

Before the use and/or development starts, application must be made to the Registrar of Titles to register the Section 173 Agreement on the Title to the land under Section 181 of the Act.

The landowner under this permit must pay the reasonable costs of the preparation, execution and registration of the Section 173 Agreement.

#### Condition 32 of Planning Permit (PA2012/3458):

Before the commencement of works, a Land Management Plan to ensure the land is managed long-term, must be submitted to and approved by the Responsible Authority. The Land Management Plan is for the entire property. The plan must include details of:

- a) Areas of native vegetation on the property to be retained and those to be removed;
- b) Methods of protecting native vegetation to be retained;



- c) Details of planting and landscaping for the property, ensuring that species of local provenance are used where possible;
- d) Weed and pest management;
- e) Responsibility for implementation and monitoring of the Land Management Plan; and,
- f) Timeframes for implementation of actions and monitoring of the Land Management Plan.

### 1.2 Land Management Plan Objectives

The objectives of the LMP are to provide for the:

- Protection and enhancement of vegetation to be retained within and adjacent to the study area;
- Identification of potential threats to the environmental values within and adjacent to the study area; and,
- Implementation of appropriate management actions to address weed infestations, and maintain and enhance environmental values within and adjacent to the study area.

### 1.3 Study Area

The study area is located on the east side of Harkness Road at 171-197 Harkness Road, Harkness. According to the Department of Environment, Land Water and Planning (DELWP) NatureKit (DELWP 2019a), the study area occurs within the Victorian Volcanic Plains (VVP) bioregion and Port Phillip and Western Port Catchment Management Authority. The study area is in the City of Melton Municipality and is within the Green Wedge A Zone and is affected by the Bushfire Management Overlay (BMO) and Environmental Significance Overlay - Schedule 1 (ESO1) (DELWP 2019b).

To the north of the study area is the Melton Gilgai Woodlands Nature Conservation Reserve. The land to the east and south is part of 171-197 Harkness Road. The surrounding area can be characterised as rural, however urban development from Melton is approaching the study area from the south-east. The land uses within the wider area include several equine training and research facilities, rural and urban living, grazing and cropping and a regional park (Macpherson Park).

The study area has been subject to two previous ecological assessments:

- Native Vegetation Management Services Pty Ltd 2012. 171 Harkness Road, Melton. Flora and Fauna Survey. Unpublished report prepared for Alex Fellia by Native Vegetation Management Services, Balliang East, Victoria.
- Ecology and Heritage Partners Pty Ltd 2015. Statement of Expert Evidence: Amended Permit Associated with the use and development of the land for the purpose of a Place of Worship – 171 – 197 Harkness Road, Melton West, Victoria. Prepared for Best Hooper Lawyers Pty Ltd, February, 2015.





#### 1.4 Land Use

The study area was in operation as a cattle feedlot for many years, with the majority of livestock removed from the site in 2011 (Native Vegetation Management Services Pty Ltd 2012). Since that time a small number of livestock have grazed the site.

The previously approved Planning Permit (PA2012/3458) allowed for the use and development of the land for the purpose of a Place of Worship with associated car parking. The current Planning Permit application is proposing the same development.



## 2 EXISTING CONDITIONS

---

### 2.1 Current study area condition

Extant EVC 2005 mapping (DELWP 2019) identifies remnant woodland vegetation within the study area, along with the Melton Gilgai Woodlands Nature Conservation Reserve immediately to the north, as the Plains Woodland / Plains Grassland Mosaic (EVC 693) (Plate 1).

Site assessments completed in 2012 (Native Vegetation Management Services Pty Ltd) and 2015 (Ecology and Heritage Partners Pty Ltd) indicated that the study area is highly degraded due to overgrazing, with a patch of remnant vegetation identified in the north-western corner (Plates 2-4). Vegetation in this area, along with the Melton Gilgai Woodlands Nature Conservation Reserve immediately to the north (Plate 5), is consistent with the Plains Woodland / Plains Grassland Mosaic (EVC 693).

The patch of remnant vegetation is approximately 0.63 hectares in size and supports an overstorey of Grey Box *Eucalyptus microcarpa* and Yellow Gum *Eucalyptus leucoxylon* subsp. *connata*, with a modified understorey dominated by the exotic Wire Weed *Polygonum aciculare*, Goose Grass *Eleusine tristachya* and Galenia *Galenia pubescens* (Native Vegetation Management Services Pty Ltd 2012).

The remainder of the study area is highly degraded, comprising exotic vegetation and extensive areas of bare ground (Plate 6). Dominant weed species identified include Goose Grass, Barley Grass *Hordeum leporinum*, Galenia and Wire Weed (Native Vegetation Management Services Pty Ltd 2012). There are scattered occurrences of African Boxthorn *Lycium ferocissimum*, Spear Thistle *Cirsium vulgare*, Artichoke Thistle *Cynara cardunculus*, Horehound *Marrubium vulgare*, Prairie Ground Cherry *Physalis hederifolia* and the Bathurst Burr *Xanthium strumarium* (Native Vegetation Management Services Pty Ltd 2012).



**Plate 1.** Plains Woodland / Plains Grassland Mosaic (EVC 693) using 2005 EVC mapping (DELWP 2019) (green blocks) within the study area (red line).



**Plate 2.** Remnant vegetation in the north-western corner of the study area that is consistent with Plains Woodland / Plains Grassland Mosaic (EVC 693) (DELWP 2019) (blue shape).





**Plate 3.** Plains Woodland / Plains Grassland Mosaic (EVC 693) in the north-western corner of the study area.

**Plate 4.** Plains Woodland / Plains Grassland Mosaic (EVC 693) in the north-western corner of the study area.



**Plate 5.** Plains Woodland / Plains Grassland Mosaic (EVC 693) immediately north of the study area, in the Melton Gilgai Woodlands Nature Conservation Reserve.

**Plate 6.** Exotic vegetation and bare ground in the study area looking east.

## 2.2 Significance Assessment

### 2.2.1 Flora

The State significant Fragrant Saltbush *Rhagodia parabolica*, listed as rare on the *Advisory List of Threatened Flora in Victoria* (DEPI 2014), was observed in the Melton Gilgai Nature Conservation Reserve to the north of the study area, however the species is not present within the study area.

### 2.2.2 Fauna

The nationally significant Swift Parrot *Lathamus discolor* has been recorded (2007) in the Melton Gilgai Nature Conservation Reserve (Melton Environment Group 2015). This species breeds in Tasmania and is a winter migrant to mainland Australia, feeding on flowering Eucalyptus species. Swift Parrot is often recorded feeding in urban areas within the region as well as remnant woodlands.

[www.ehpartners.com.au](http://www.ehpartners.com.au)

Several state significant woodland bird species such as Diamond Firetail *Stagonopleura guttata*, Brown Treecreeper *Climacteris picumnus victoriae*, Speckled Warbler *Chthonicola sagittata*, Powerful Owl *Ninox strenua* and Barking Owl *Ninox connivens connivens* have been recorded within 10 kilometres of the study area and may utilise the woodland habitat to the north of the study area on occasion. While no suitable nesting habitat exists for these species within the study area, these species may periodically occupy habitats within the woodland area adjacent to the location of the proposed Place of Worship.



## 3 LAND MANAGEMENT PLAN

### 3.1 Management Issues

Several potential threatening ecological processes and management issues exist across the study area, including pest animals and plants, and the future protection and rehabilitation (including natural regeneration) of remnant Plains Woodland / Plains Grassland Mosaic on-site. The management of off-site impacts to the Melton Gilgai Nature Conservation Reserve to the north is also important.

#### 3.1.1 Remnant Vegetation to be Removed

The Place of Worship has been designed to avoid the majority of remnant vegetation present within the study area. One tree is proposed to be removed north of the development footprint (Figure 2) to satisfy the vegetation management requirements as part of the BMO.

#### 3.1.2 Weeds

As described above, the understory is highly degraded, comprising exotic vegetation and large areas of bare ground. Dominant weed species throughout the study area and/or within other areas of 171-197 Harkness Road include Goose Grass, Barley Grass, Galenia and Wire Weed, along with scattered African Boxthorn, Spear Thistle, Artichoke Thistle, Horehound, Prairie Ground Cherry and Bathurst Burr (Native Vegetation Management Services 2012).

African Boxthorn is a recognised Weed of National Significance (WoNS) (Australian Weeds Committee (AWC) 2012), and along with Spear Thistle, Artichoke Thistle, Horehound, Prairie Ground Cherry and Bathurst Burr are declared noxious weeds that must be Regionally Controlled (C) in Victoria. Declared noxious weeds are plants proclaimed under the *Catchment and Land Protection Act 1994* (CaLP Act) because they cause environmental or economic harm, or have the potential to cause such harm (AWC 2012).

It should be noted that all land managers/persons are required under the CaLP Act to prevent the growth and spread of a Regionally Controlled weed (C) for which they are responsible. Land managers that do not control Regionally Controlled weeds may be issued with a Land Management Notice or Directions notice that requires specific control work to be undertaken. Failure to comply with the conditions of a Notice may result in court action and fines or the issuing of an infringement notice and fine (Department of Primary Industries (DPI) 2008).

Sections 70, 70A and 71 of the CaLP Act for all declared noxious weeds, irrespective of category or region, prohibits the:

- Transport of a noxious weed or its propagules within Victoria.
- Deposition on land of a noxious weed or its seeds (DPI 2008).

##### 3.1.2.1 Priorities for weed management

While some of these weeds may not currently exist within the study area, they exist elsewhere within the property. This information provides a comprehensive guide for all weeds in the event they begin to grow within the study area, if not already. Priorities for weed management are shown in Table 1 and have been based on the following criteria:





#### Threat Level

- High: Rapidly spreading species with the potential for high ecological impacts.
- Moderate: Moderately spreading species with the potential for high ecological impacts.
- Low: Slow spreading species with the potential for high ecological impacts.

#### Infestation Level

- High: Weed infestation over large areas across the site.
- Moderate: Weed infestation over moderate areas on the site.
- Low: Localised weed infestation across the site.

#### Control Priority

- High priority: Issue poses a high level of threat to ecological values, and needs to be addressed immediately and on a frequent basis. (Management should commence in Year 1, with high frequency treatment ongoing as required).
- Moderate priority: Issue has a high to moderate threat level and needs to be addressed in the short-term or on a regular basis (Management should commence no later than Year 2, with moderate frequency treatment ongoing as required).
- Low priority: Issue has a medium to low threat level, or low likelihood of occurrence, and needs to be addressed on an irregular basis (Management should commence by Year 3 once High and Moderate priority threats have been minimised. Continue treatment as required).

**Table 1.** Priority weeds known to occur within the study area (Native Vegetation Management Services Pty Ltd 2012)

Scientific Name	Common Name	Weed Classification (PPWCMA)	Threat Level	Extent of Infestation (2015)	Control Priority
<i>Cirsium vulgare</i>	Spear Thistle	C	High	Moderate	High
<i>Cynara cardunculus</i>	Artichoke Thistle	C	High	Low	Moderate
<i>Eleusine tristachya</i>	Goose Grass	-	Moderate	High	Moderate
<i>Galenia pubescens</i>	Galenia	-	High	Moderate	Moderate
<i>Hordeum leporinum</i>	Barley Grass	-	Moderate	Moderate	Moderate
<i>Lycium ferocissimum</i>	African Boxthorn	C, WONS	High	Low	High
<i>Marrubium vulgare</i>	Horehound	-C	Moderate	Low	Low
<i>Physalis hederifolia</i>	Prairie Ground Cherry	C	High	Low	Moderate
<i>Polygonum aviculare</i>	Wire Weed	-	Low	Moderate	Low
<i>Xanthium spinosum</i>	Bathurst Burr	C	Moderate	Low	Low

Notes: C = Regionally Controlled weed, WONS = Weeds of National Significance.



### 3.1.3 Protection of Remnant Vegetation

Patches of remnant native vegetation, consistent with the Plains Woodland / Plains Grassland Mosaic, were identified within the study area and the Melton Gilgai Woodlands Nature Conservation Reserve that lies immediately north of the property (Plates 2-5).

Although impact to this area is not proposed as part of the development of the Place of Worship, management actions must be implemented to ensure remnant vegetation does not degrade further as a result of the ongoing use of the site.

### 3.1.4 Pest Animals

One pest animal listed under the *Catchment and Land Management Act 1994* (CaLP Act) was recorded within the study area, being the European Rabbit *Oryctolagus cuniculus*. Also likely to occur within and surrounding the study area, and considered important for control, is the European Red Fox *Vulpes vulpes*.

## 3.2 Management Actions

The following management actions and performance measures are detailed below to protect and enhance the study area, and to ensure the long-term functionality of the site in the future.

### 3.2.1 Weed Control

Ongoing weed control is the primary management issue within the study area. Weed control objectives are to eliminate woody weeds and other high threat weeds such as African Boxthorn, Spear Thistle, Artichoke Thistle from the site, and to control all other weed populations to manageable levels (ideally <5% cover).

Weed control works should be carried out by an experienced contractor. Licensed weed control contractors will have a greater ability to make appropriate decisions on which technique to use based on individual situations and the targeted species. Contractors will also need to be aware of the potential for new outbreaks of weed species not recorded in this assessment and implement appropriate weed control techniques as necessary.

A list of priority weeds that require control within the study area, and their current level of threat are provided in Table 1. Several management techniques are recommended to control weeds, including physical removal, brush cutting and herbicide application. In the majority of cases, herbicide will only be applied to weeds by using the spot-spraying technique, to prevent death or damage to non-target species. A summary of weed management techniques for noxious weeds (i.e. listed under the CaLP Act) and WONS is provided in Table 2. Primary weed control techniques are outlined in Appendix 1.

#### Actions

- Undertake weed control works prior to flowering and setting seed;
- Eliminate all listed noxious weeds, WONS and other woody weeds;
- Where appropriate, promote persistence and expansion of indigenous flora species; and,
- Monitor for the occurrence of new weeds or the further spread of current weeds.



### Performance Indicators

Key performance indicators for weed management include:

- Meeting the requirements of the CaLP Act in relation to control of listed noxious weeds within the study area;
- No new significant weed invasions occur in the study area;
- Establishment of photo-points throughout the site in consultation with Council so that changes in extent of weed infestation can be documented over time;
- Eliminate (<1% cover) noxious, High threat and woody weeds by Year 3;
- Reduce cover of Moderate threat weeds to <10% by Year 3, and <5% by Year 5; and,
- No increase in the cover of Low threat weeds within the study area.

Table 2. Weed control targets

Scientific Name	Common Name	Control Method	Timing	Threat Level	Control Priority	Current Cover	Goal
<i>Cirsium vulgare</i>	Spear Thistle	SS, HP	SS: Sept-Nov HP: Year-round	High	High	2%	Eliminate (<1%)
<i>Cynara cardunculus</i>	Artichoke Thistle	SS, HP	SS: Sept-Nov HP: Year-round	High	Moderate	2%	Eliminate (<1%)
<i>Eleusine tristachya</i>	Goose Grass	SS, HP, SL	SS: Sept-Nov HP, SL: Year-round	Moderate	Moderate	15%	Reduce cover (<5%)
<i>Galenia pubescens</i>	Galenia	SS, HP, SL	SS: Sept-Nov HP, SL: Year-round	Moderate	Moderate	8%	Reduce cover (<5%)
<i>Hordeum leporinum</i>	Barley Grass	SS, HP	SS: Sept-Nov HP: Year-round	Moderate	Moderate	8%	Reduce cover (<5%)
<i>Lycium ferocissimum</i>	African Boxthorn	M, CP	September - May	High	High	2%	Eliminate (<1%)
<i>Marrubium vulgare</i>	Horehound	SS, HP	SS: Sept-Nov HP: Year-round	Moderate	Low	2%	Reduce cover (<5%)
<i>Physalis hederifolia</i>	Prairie Ground Cherry	SS, HP	SS: Sept-Nov HP: Year-round	High	Moderate	2%	Eliminate (<1%)
<i>Polygonum aviculare</i>	Wire Weed	SS, HP, SL	SS: Sept-Nov HP, SL: Year-round	Low	Low	5%	Maintain at current levels
<i>Xanthium spinosum</i>	Bathurst Burr	SS	SS: Sept - Jan HP: Year-round	Moderate	Low	2%	Reduce cover (<5%)

Notes: CP = Cut and Paint; SS = Spot Spray; HP = Hand Pull; SL = Slash/Brushcut; M = Mechanical Removal.





### 3.2.2 Fencing

Without active management and appropriate fencing, unrestricted access to patches of remnant vegetation may result in loss of native vegetation cover, soil disturbance and compaction and weed facilitation. The perimeter of the property is currently enclosed by permanent post-and-wire fencing. In accordance with Condition 2 of the Planning Permit, additional fencing will be installed to prevent access to remnant vegetation and to encourage natural regeneration of native vegetation.

#### Actions

- Prior to commencement of works, the patch of trees in the north-west corner of the property will be permanently fenced off with post-and-wire fencing to the drip line plus two (2) metres (as per Condition 2 (d) in Section 1.1) (with gates for private access, as required) (Figure 2). Fencing will be signed as 'tree protection zone'. Fill, machinery and building materials will not be placed, even for a short time, within the tree protection zone.
- During and after the completion of works, nothing, including vehicles, will be stored under the canopy of any existing remnant trees or on areas of native vegetation.
- All new fencing will be permanent post-and-wire fencing and constructed with minimal impact to the areas to be protected (i.e. no stock piling of fencing materials on soil during construction).

#### Performance Indicators

No ingress to areas of remnant or regenerating vegetation, i.e. the fenced-off areas. The existing track towards the northern end of the study area will continue to be used.

### 3.2.3 Pest Animals

Management options and procedures are provided below for two common pest species, European Rabbit and Red Fox. However the control of pest animals is considered a low priority as the study area is limited in its ability to support significant numbers of these species, and given that refuge habitat is likely to be present in neighbouring areas such as the Melton Gilgai Woodlands Nature Conservation Reserve. Therefore the management options provided below should be considered as contingency measures to be incorporated should pest animals appear in the future.

#### 3.2.3.1 *European Rabbit*

An evaluation of management measures commonly adopted to control European Rabbits in Victoria is provided below (Table 3). European Rabbits commence breeding in autumn and continue until vegetation dries off, which generally occurs in early summer. Rabbit mortality is particularly high during summer months due to disease, lack of food and water, and high temperatures. Late summer and early autumn is therefore the best time to control rabbits as populations are naturally low.

Table 3 Feasibility assessment of European Rabbit control methods

Method	Comments
Baiting (Pindone)	Although an antidote exists for domestic pets which have ingested Pindone (Vitamin K1), the risks associated with the poisoning of domestic and native animals is considered unreasonable. Additionally, consultation with qualified pest controllers indicated that pindone poisoning may not be successful, as rabbits are unlikely to feed on introduced bait if an abundance of existing food sources are present.
Warren fumigation	The site inspection identified very little evidence of warrens across the site. In the event that significant warren networks become established, this method is considered suitable for control.
Warren ripping	As above. In order to avoid impacts on native vegetation communities, ripping would be constrained to areas of maintained exotic grassland and other non-native vegetation.
Long netting and night netting	Night netting is an effective method, particularly in situations where rabbits are leaving bushland harbour to feed in areas of open space.

### 3.2.3.2 Red Fox

An evaluation of management measures commonly adopted to control Red Foxes in Victoria is provided below (Table 4). The most effective fox control is achieved during late winter and spring. At this time foxes are less mobile, they are rearing young and food demands are high. At other times there are more young animals to move into vacated territories. Fumigation and den destruction is most effective during August and September, within 10 weeks of cubs being born. Vixens are only likely to be killed through fumigation when they are confined to the den, within the first three weeks after the birth of cubs.

Table 4 Feasibility assessment of Red Fox control methods

Method	Comments
Baiting	The risks of poisoning domestic and native animals is considered unreasonable. Additionally, the costs of baiting would exceed the available resources for pest animal management in ELP.
Fumigation and den destruction	If completed at appropriate times, fumigation and den destruction can be effective in reducing fox numbers.
Shooting	Owing to the high recreational use of the site, shooting is not considered a feasible option.
Trapping	Jawed traps and cage traps can be used to control Red Foxes, however the success of trapping is relatively low, as foxes are known to be extremely trap-shy. Based on the trapping effort required and low likelihood of success, trapping is not considered a feasible control option.

#### Actions

- Continually monitor for the presence of pest animal fauna;
- Where appropriate, undertake preferred control methods as summarised above.

#### Performance Indicators

Key performance indicators for pest animal management include:

- Meeting the requirements of the CaLP Act in relation to control of listed fauna within the study area;
- Presence of pest fauna does not increase above current levels of occurrence;



- Achieving control of key fauna species within the study area within the specified management timeframe; and,
- No new significant pest fauna invasions occur in the study area.

### 3.2.4 Landscape Planting

Landscape planting should use indigenous species appropriate to the local EVC (Plains Woodland / Plains Grassland Mosaic) wherever possible, or as advised by a suitably qualified landscape contractor. Environmental weeds as referred to in the *Advisory list of environmental weeds of the Inland Plains bioregions of Victoria* (Department of Sustainability and Environment (DSE) 2009) **must not** be planted as part of landscaping works.

## 3.3 Responsibilities and Timeframes

### Responsibilities

The relevant landowners are responsible for all management actions described in this plan.

### Timeframes

A timetable for the above management actions is provided below (Table 5).

Table 5. Timetable of management actions

Year	Management action	Timing of action	Report reference
0	Install protective fencing.	Prior to commencement of construction activities.	Section 3.2.2
	Landscape planting to use indigenous species appropriate to the local EVC.	During or immediately after construction activities.	Section 3.2.4
1	Implement weed control for High Priority weeds.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
2	Implement weed control for Moderate Priority weeds.	In accordance with Table 2.	Section 3.2.1
	Ongoing weed control for High Priority weeds.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
	Implement pest animal control, as required.	As required.	Section 3.2.3
3	Implement weed control for Low Priority weeds.	In accordance with Table 2.	Section 3.2.1
	Ongoing weed control for High Priority weeds.	In accordance with Table 2.	Section 3.2.1
	Ongoing weed control for Moderate Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
4	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
	Implement pest animal control, as required.	As required.	Section 3.2.3
5	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
6	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1





Year	Management action	Timing of action	Report reference
	Maintain fencing.	Annually.	Section 3.2.2
	Implement pest animal control, as required.	As required.	Section 3.2.3
7	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
8	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
	Implement pest animal control, as required.	As required.	Section 3.2.3
9	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
10	Ongoing weed control for High, Moderate and Low Priority weeds, as required.	In accordance with Table 2.	Section 3.2.1
	Maintain fencing.	Annually.	Section 3.2.2
	Implement pest animal control, as required.	As required.	Section 3.2.3



## 4 REFERENCES

---

- Australian Weeds Committee (AWC) 2012. Weeds of National Significance 2012. Department of Agriculture, Fisheries and Forestry, Canberra, ACT
- DELWP 2019a. NatureKit [WWW Document]. URL <http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit>. Victorian Department of Environment, Land, Water and Planning.
- DEPI 2014 Advisory List of Threatened Flora in Victoria. Department of Environment and Primary Industries, East Melbourne, Victoria.
- DPI 2008. Declared Noxious Weeds – Listed by Common Name. Landcare Notes. Department of Primary Industries, East Melbourne, Victoria.
- DELWP 2019b. VicPlan [WWW Document]. URL <https://mapshare.vic.gov.au/vicplan/>. Victorian Department of Environment, Land, Water and Planning.
- Ecology and Heritage Partners Pty Ltd 2015. Statement of Expert Evidence: Amended Permit Associated with the use and development of the land for the purpose of a Place of Worship – 171 – 197 Harkness Road, Melton West, Victoria (Aaron Organ). Prepared for Best Hooper Lawyers Pty Ltd, February, 2015.
- Melton Environment Group 2015. [www Document]. URL <http://www.meltonenvironmentgroup.org.au/index.php>
- Native Vegetation Management Services Pty Ltd 2012. 171 Harkness Road, Melton. Flora and Fauna Survey. Unpublished report prepared for Alex Fellia by Native Vegetation Management Services, Balliang East, Victoria.

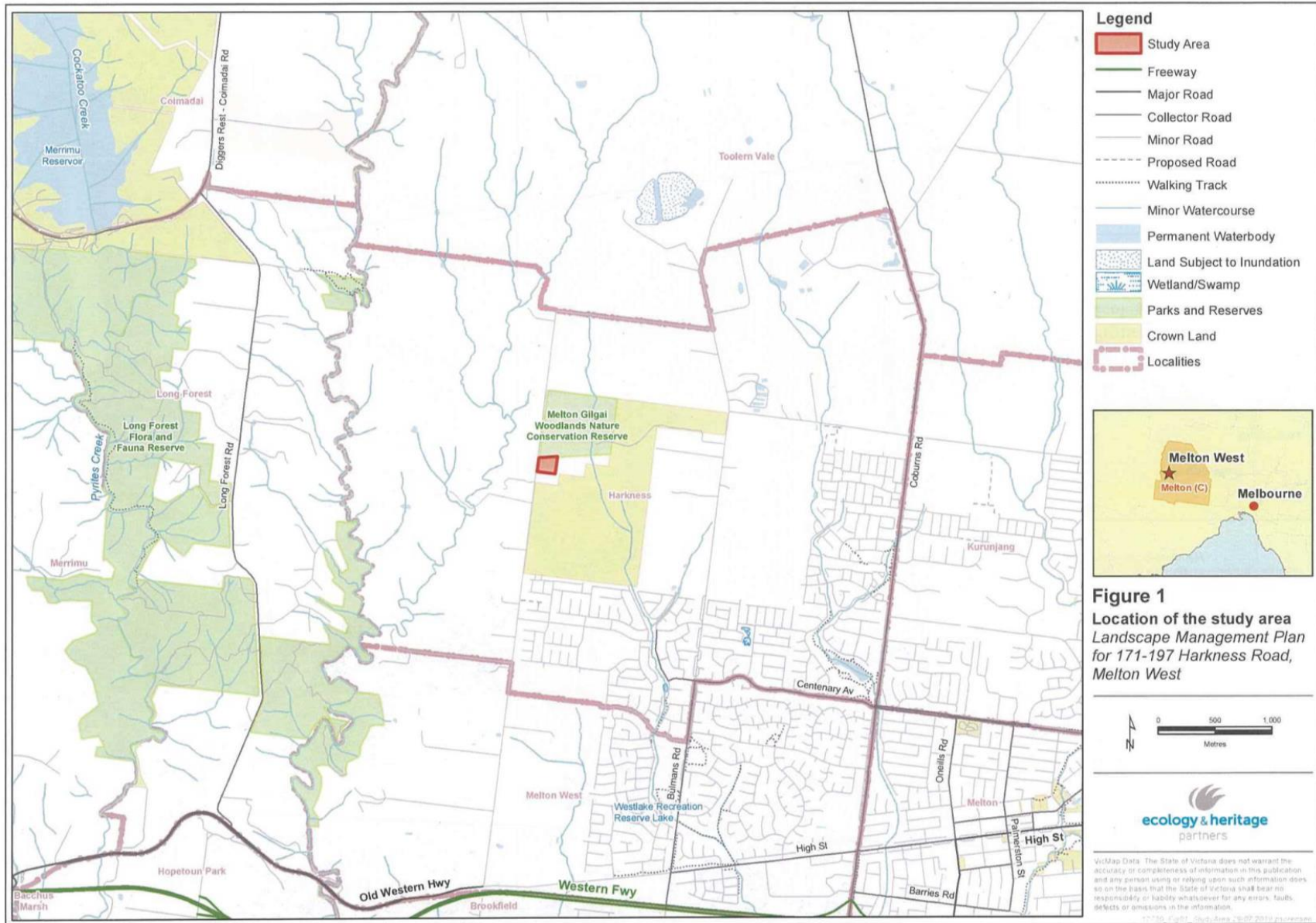


[www.ehpartners.com.au](http://www.ehpartners.com.au)

## 5 FIGURES

---













## APPENDIX 1: WEED CONTROL MEASURES

Weed control measures identified in Table 2 are described in detail below. Weed control measures (including type of herbicide) should follow the guidance of an experienced contractor for the control of the weed species identified above.

### Herbicides

#### *Spot spraying*

The application of herbicides is an effective and efficient control technique for a range of woody, herbaceous and grass weeds. The correct use and application of herbicides can provide targeted control of a range of species, however it must be stressed all use of herbicides must be used in accordance with the manufacturer's specifications and occupational health and safety policies.

Application methods for herbicides include spot spraying with a knapsack for small or sensitive areas, or for targeted species. Dabbing of species with foam tipped application device, with the herbicide applied from an attached bottle, should be used in sensitive areas or in areas where weed control is targeted to a small number of plants, especially bulbs or tuberous plants.

Timing of intervals, plant age and growth seasons, plant stress levels and climatic factors all need to be considered when develop methodologies for the application of herbicides to ensure successful outcomes. Problems exist with ongoing unsuccessful herbicide treatments, which may result in weeds developing herbicide resistance, or the build-up of chemicals in the soil. Surrounding plants' susceptibility to herbicides and ongoing uses of the treated areas should also be considered when choosing the right herbicide to be used in a weed control program, as some herbicides are residual and may persist within the soil for varying durations.

### Drill and Fill

Drill and fill, also known as direct injection, is a method where the selected herbicide (usually Glyphosate) is injected through a device into a hole that has been made into the targeted plant (i.e. woody species). The hole is usually made through the use of a drill but sometimes a tomahawk or saw may be used to put small nicks into the targeted plant. It is essential that the hole or nick must always be lower than the first branch containing foliage (i.e. ideally, the lowest possible point on the plant) and also the herbicide is applied into the hole as quick as possible. The general rule of thumb is that the herbicide must be applied within 30 seconds. Holes are scattered around the main trunk at 50 millimetre intervals, depending on the diameter of the trunk and also branches or angle of the trunk. It is essential that a complete ring around the trunk of the plant be made of this herbicide filled holes to ensure plant death, as large gaps may allow sections of the target tree to survive. Generally, the holes or nicks do not need to be deeper than 20 millimetres, but do need to be deep enough to penetrate the outer cambium layer of the tree. This allows the phloem to carry the herbicide into the roots, which will kill the plant over a number of weeks, depending on conditions.

The benefits of this method include: the retention of standing material for habitat, no costs for the removal of the plant from the site; no dragging of material across sensitive areas; and, speed, as the method is fast to execute (i.e. drill and fill, and move on).

The drawbacks of this method are that if it is not executed correctly, trees may re-grow, particularly as accessing the base of the trunk of spiny plants such as Hawthorn and African Box-thorn can be difficult.





However if the application is successful, dead standing vegetation can become a fire hazard and look aesthetically displeasing to the community.

#### Cut and Paint

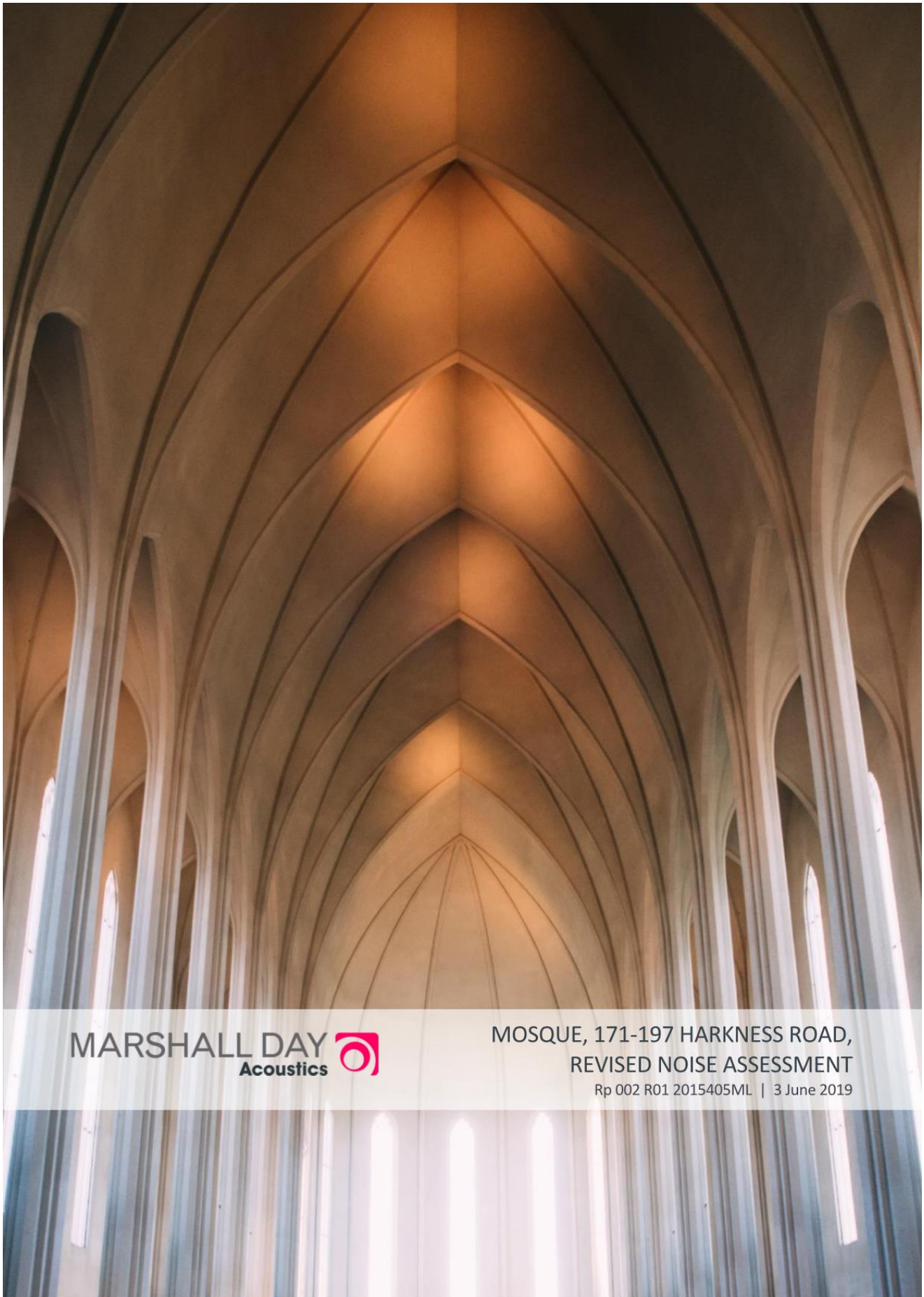
The cut and paint method of control requires the cutting of the target species at the very base, under any foliage, and the immediate application of herbicide (usually a glyphosate, dependent on the target species). The application can be done through a 'dabber' bottle or paint brush. Care should be undertaken during application, to avoid splash of herbicide causing non-target damage. Once cut down, the biomass of the target species may sometimes be left on the ground, but usually requires removal. This is particularly necessary if it bears fertile seeds or has the potential to re-shoot from contact with moist ground (i.e. *Salix* sp.), or covers native vegetation.

Many herbicides are available that are very effective in the control of woody weed species. Typically these herbicides are applied to the stem, trunk or roots of the target plant by 'drill and fill', 'cut and paint' or 'frilling' methods of application. These herbicides can be more effective than manual removal alone, as the chance of the plant re-sprouting is significantly reduced.

#### Manual Removal/Hand pulling

Some weed species are resilient against other methods of eradication, such as herbicides, and should be targeted by manual removal. Infestations of species such as African Box-thorn, Fennel, Serrated Tussock and Toowoomba Canary-grass should be combated by manual removal techniques.

Additionally, manual removal is a crucial technique when used in conjunction with herbicides for the control of both woody and herbaceous weed species. This combination of weed eradication is advised for almost all weed species.



**MARSHALL DAY**   
Acoustics

MOSQUE, 171-197 HARKNESS ROAD,  
REVISED NOISE ASSESSMENT

Rp 002 R01 2015405ML | 3 June 2019



6 Gipps Street  
Collingwood VIC 3066  
Australia  
T: +613 9416 1855  
ABN: 53 470 077 191  
www.marshallday.com

Project: **MOSQUE, 171-197 HARKNESS ROAD, MELTON WEST**

Prepared for: **Melbourne Islamic Centre Pty Ltd  
PO Box 581  
Riverstone NSW 2765  
AUSTRALIA**

Attention: **Mr Wajahat Rana**

Report No.: **Rp 002 R01 2015405ML**

#### Disclaimer

Reports produced by Marshall Day Acoustics Pty Ltd are prepared based on the Client's objective and are based on a specific scope, conditions and limitations, as agreed between Marshall Day Acoustics and the Client. Information and/or report(s) prepared by Marshall Day Acoustics may not be suitable for uses other than the original intended objective. No parties other than the Client should use any information and/or report(s) without first conferring with Marshall Day Acoustics.

We stress that the advice given herein is for acoustic purposes only, and that the relevant authorities and experts should be consulted with regard to compliance with regulations or requirements governing areas other than acoustics.

#### Copyright

The concepts and information contained in this document are the property of Marshall Day Acoustics Pty Ltd. Use or copying of this document in whole or in part without the written permission of Marshall Day Acoustics constitutes an infringement of copyright. Information shall not be assigned to a third party without prior consent.

#### Document Control

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Final	-	-	21 Jan 2019	S McHugh	G Lee
Final	1	Incorporates updated site boundary	3 June 2019	G Lee	C Delaire







## TABLE OF CONTENTS

1.0	INTRODUCTION.....	5
2.0	SITE DESCRIPTION.....	6
2.1	Project description.....	7
2.2	Proposed changes to the scheme.....	8
3.0	LEGISLATION AND GUIDELINES.....	9
3.1	Victorian Legislation.....	9
3.2	Guidelines.....	10
4.0	EXISTING NOISE ENVIRONMENT.....	11
5.0	ACOUSTIC MODELLING METHODOLOGY.....	12
5.1	Calculation Method.....	12
5.2	Construction assumptions.....	13
6.0	SEPP N-1 ASSESSMENT.....	14
6.1	SEPP N-1 Limit.....	14
6.2	Deliveries and waste collection.....	14
6.3	Mechanical services.....	15
6.4	Cumulative effective noise level of all on-site activities.....	15
7.0	SEPP N-2 ASSESSMENT.....	16
7.1	SEPP N-2 limit.....	16
7.2	Assessment.....	16
8.0	SLEEP DISTURBANCE ASSESSMENT.....	18
8.1	Sleep disturbance criteria.....	18
8.2	Assessment.....	18
9.0	CONCLUSION.....	19
9.1	Deliveries and waste collection.....	29
9.2	Worshipper activities.....	29
9.3	Typical Mechanical Services Equipment.....	30
9.4	Typical internal noise levels.....	30



APPENDIX A	GLOSSARY OF TERMINOLOGY
APPENDIX B	UNATTENDED MEASUREMENTS
APPENDIX C	NOISE MONITORING RESULTS
APPENDIX D	LEGISLATION AND GUIDELINES
APPENDIX E	NOISE DATA



## 1.0 INTRODUCTION

Melbourne Islamic Centre Pty Ltd is proposing to develop a place of worship at 171-197 Harkness Road in Melton West.

Marshall Day Acoustics Pty Ltd (MDA) has been engaged to undertake an assessment of noise from the proposal.

MDA provided an initial report in 2015 (Rp001 R01, dated 18 November 2015) and this report has been prepared in response to minor changes to the scheme.

The project responds to Condition 14 of Planning Permit PA2012/3458 which was issued by the City of Melton on 4<sup>th</sup> May 2015 and states:

14. *The following acoustic conditions apply:*

- a) *Noise levels emanating from the premises must not exceed those required to be met under State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2*
- b) *Before plans are endorsed under condition 1 or construction of the Place of worship starts, a report must be prepared and submitted to the satisfaction of the Responsible Authority by a suitably qualified acoustic consultant which makes recommendations for detailed design of buildings or works (if required) or for measures relating to the way the use is conducted (if required) to ensure that compliance with the relevant noise criteria or limits in any relevant Statement of Environment Protection Policy or relevant sleep disturbance guidelines will be achieved*
- c) *Any detailed design of buildings or works or measures relating to the use in the recommendations of the report prepared under paragraph (b) must at all times be complied with to the satisfaction of the Responsible Authority and any works must be carried out and completed before the use starts.*

This report has been prepared to address potential noise impacts to residential properties in the immediate vicinity of the subject site.

A glossary of acoustic terms used within this report is provided in Appendix A.



## 2.0 SITE DESCRIPTION

The proposed site is located on land at 171-197 Harkness Road in Melton West, and is bounded by the following:

- A nature reserve to the north
- Land that is understood to have been given over as a cemetery to the east and south
- The existing residence is to be retained and is located approximately 63 metres to the south of the proposed building
- The nearest existing residential dwelling that is not within the bounds of the site is to the south east at a distance of approximately 380 metres from the nearest point of the proposed building
- Open grass land to the west.

It is understood that the land is not going to be subdivided. Therefore, in terms of the relevant legislation, the nearest noise sensitive receptor is located at 200-224 Harkness Road.

An aerial photograph of the subject site and surrounds is provided in Figure 1.

**Figure 1: Site location and surrounds (Image: Nearmap)**



The proposed development is in a Green Wedge A Zone (GWAZ) with Public Use Zone – Cemetery (PUZ5) in the immediate environs.

A map of the land uses in the vicinity of the site is presented in Appendix B.



2.1 Project description

It is understood that the proposal will develop a place of worship with a maximum capacity of 60 worshippers at any one time. Associated car parking will be located to the south east of the building.

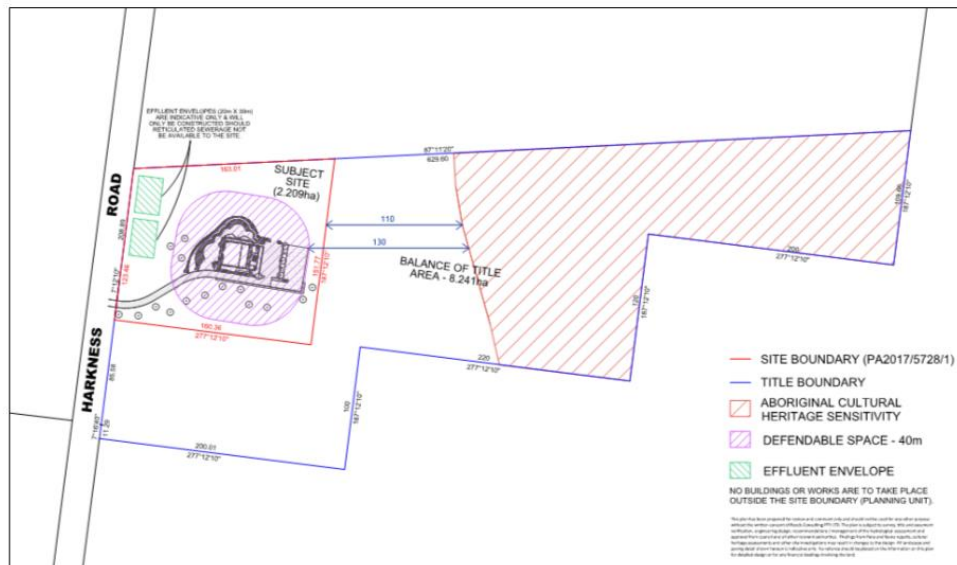
The allowable operating hours are defined in Condition 7 of the Permit. For the purposes of this assessment it has been assumed that the mosque could operate at any time between 0500 hrs and 2300 hrs on any day.

An indicative sketch of proposed building is included as Figure 2 and an indicative site layout is presented as Figure 3.

Figure 2: Indicative building form



Figure 3: Indicative site layout





## 2.2 Proposed changes to the scheme

The proposed changes to the scheme relate to the construction materials for the site building. The original assessment (Rp001 R01 2015405ML, dated 18 November 2015) made reference to lightweight facade materials and single-glazed windows. It is understood that the latest design includes masonry facade materials and double-glazed windows. Further details are provided in Section 6.2.

Further it is understood that an amendment to the application will be submitted in due course to constrain the site to the immediate vicinity of the place of worship. The noise modelling has been updated to reflect this change.





### 3.0 LEGISLATION AND GUIDELINES

A range of guidelines and legislation are used in Victoria to assess and control environmental noise. This section provides an overview of the key documents and guidelines that are applicable to the redevelopment of the venue.

#### 3.1 Victorian Legislation

A summary of the relevant Victorian legislation is provided in Table 1. Refer to Appendix D for further details.

**Table 1: Relevant Victorian noise legislation**

Document	Overview
Environment Protection Act 1970 (the Act)	The Act provides the overarching legislative framework for the protection of the environment in Victoria. It establishes obligations for the control of environmental noise and applies to all types of noise sources except rail operations. The legislation does not specify noise limit values, but sets out legal requirements to comply with State environment protection policies and prescribed standards.
State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1)	SEPP N-1 defines mandatory noise limits for commercial, industrial or trade premises in the Metropolitan Region of Melbourne. The limits apply to the level of noise occurring at neighbouring sensitive receivers. The noise limits are determined on the basis of land zoning and background noise levels, and are separately defined for day, evening and night periods. Refer to Appendix D1 for further detail and noise limit derivation
State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2 (SEPP N-2)	SEPP N-2 defines mandatory noise limits for music associated with public premises in the State of Victoria, including indoor and outdoor venues. The limits apply to the level of noise occurring at neighbouring sensitive receivers. Noise limits are determined on the basis of background noise levels, and are separately defined for day, evening and night periods. Refer to Appendix D2 for further detail and noise limit derivation.



### 3.2 Guidelines

A summary of relevant guidelines referenced in Victorian noise assessments is presented in Table 2.

**Table 2: Relevant Victorian references and guidelines**

Reference	Overview
EPA Publication 1254 <i>Noise Control Guidelines</i> (EPA Guidelines)	Provides an overview of noise policies and legislation in Victoria for a range of different noise sources, and provides supplementary guidance for situations where there is no policy or legislation.  Refer to Appendices D3 and D4 for further detail.
Sleep disturbance criteria sourced from NSW Road Noise Policy 2011 (Sleep disturbance criteria)	The provisions of this document are often referred to in Victoria for general guidance on potential sleep disturbance.  Based on a review of research into sleep disturbance, the NSW policy nominates maximum external night-time noise levels at noise sensitive locations which are unlikely to disturb sleep.  Refer to Appendix D5 for further detail.



#### 4.0 EXISTING NOISE ENVIRONMENT

Consecutive measurements of background noise were obtained between 1230 hrs on Monday 12 and 1200 hrs on Wednesday 14 October 2015.

Given the context of the site, and the level of development that has been completed in the interim, it is expected that the background level measured in 2015 will not have changed significantly.

Measured noise levels are summarised in Table 3 and Appendix B presents further detail on the monitoring position and methodology.

**Table 3: Measured background noise levels**

Period	Average Background Noise Level, $L_{A90}$ dB		
	Day	Evening	Night
Minimum	36	33	30

Spectral background levels were also measured for the purposes of setting night-time limits in accordance with SEPP N-2 and are presented in Table 4.

**Table 4: Spectral night-time background level**

	Octave band centre frequency, Hz						
	63	125	250	500	1000	2000	4000
Background noise, $L_{90}$ dB	40	35	28	29	25	17	15



## 5.0 ACOUSTIC MODELLING METHODOLOGY

To predict noise levels to nearby neighbouring residences, the following factors have been considered:

- The amount of noise being generated within the venue
- The distance between the sources and receivers
- The presence of obstacles such as buildings or screens that obstruct the noise path
- The ground between the source and receiver
- The presence of hard reflective surfaces that may enable additional noise paths.

The following sections describe the modelling used to extrapolate that data to surrounding receiver locations, accounting for the above factors.

### 5.1 Calculation Method

A 3-dimensional digital model of the venue and surrounding built environment has been created using SoundPLAN proprietary modelling software (version 8).

Geometry data for the model has been sourced from public aerial photography, visual inspections of the area, and building heights defined on the basis of standard assumed heights per floor level. The geometries in the model are simplified representations of the built environment that have been configured to a level of detail that is appropriate for noise calculation purposes.

The SoundPLAN digital model has been used to calculate noise levels using the International Standard *ISO 9613-2: 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (ISO 9613). ISO 9613 is a general environmental noise calculation standard that has been used extensively throughout Australia, New Zealand, and Europe since its publication in 1996.

The implementation of ISO 9613 within proprietary noise modelling software enables multiple sound transmission paths, including reflected and screened paths, to be accounted for in the calculated noise levels. While atmospheric effects are expected to have a negligible effect on the transmission of sound from the venue to neighbouring sensitive receiver locations, it is noted that the ISO 9613 predicts noise levels for conditions which favour the propagation of noise.

Screen shots of the noise model are presented below as Figure 4 and Figure 5.

**Figure 4: Screenshot of the noise model – three dimensional**

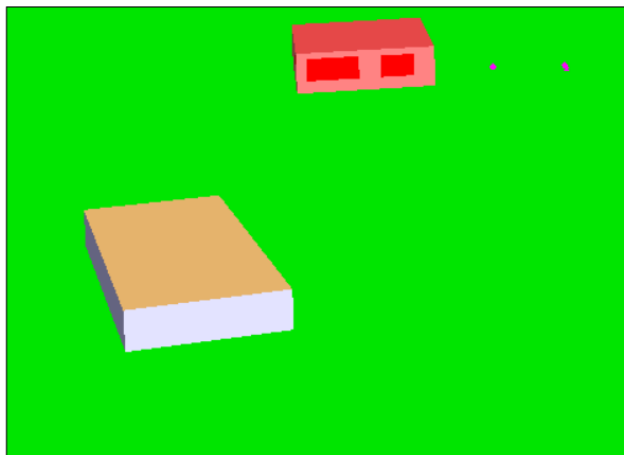


Figure 5: Screenshot of the noise model – plan view



## 5.2 Construction assumptions

It is understood that the construction of the buildings is to be broadly as follows:

- Walls formed of core filled concrete blocks (190 mm thick), external acrylic render, internal plasterboard lining on the battens with thermal insulation between battens
- Colorbond metal roofing, steel structure, insulation batts over ceiling lining with 2 layers of antiglare foil, plasterboard ceiling lining on furring channels
- Double glazing (assumed to be a minimum of 6/12/6mm).

It has been assumed that the floor will be covered with thick carpet.

Calculations have been made as to the likely weighted sound reduction performance ( $R_w$ ) of each of the building elements, as follows:

- Walls:  $R_w$  59 dB
- Roof:  $R_w$  36 dB
- Glazing:  $R_w$  35 dB.



## 6.0 SEPP N-1 ASSESSMENT

The following sections provide the predicted noise levels from the sources covered under SEPP N-1.

### 6.1 SEPP N-1 Limit

Table 5 details the SEPP N-1 day, evening and night periods and the corresponding zoning level and noise limit for each period.

**Table 5: SEPP N-1 limits**

Period	Day	Evening	Night
SEPP N-1 limit	48	42	39

On the basis that mechanical plant may operate any time, noise emissions must comply with the SEPP N-1 night-time noise limits in Table 5. Compliance with the night-time noise limit will imply compliance with the day and evening noise limits.

### 6.2 Deliveries and waste collection

Noise from deliveries and waste collections must meet the SEPP N-1 noise limits. Compliance is determined by comparing the predicted effective noise level ( $L_{eff}$ ) to the noise limits at the nearest affected residential dwellings. The effective noise level is calculated taking into account the following:

- Noise attenuation provided by distance, screening, and sound energy losses between the truck movements and residential dwellings
- Duration of truck noise exposure at residential dwellings, assessed over a 30 -minute period in accordance with SEPP N-1
- Applicable character-based noise level corrections, such as corrections for tonality.

The following assumptions were also made in the assessment of noise levels from deliveries and waste collection at the site:

- No deliveries or waste collections occur during the SEPP N-1 defined evening or night-time period (Appendix D)
- A worst-case 30-minute day-time period could include:
  - One waste collection, or
  - one delivery by a LRV.

The predicted effective noise levels for the day-time period of deliveries and waste collection activities to the affected residential dwellings are provided in Table 6.

**Table 6: Predicted effective noise levels for the day-time period, dB**

Day-time (deliveries and waste collection)	200-224 Harkness Road
Waste collection (includes duration correction), $L_{Aeq}$	<30
Delivery (includes duration correction), $L_{Aeq}$	<30
Highest noise level, $L_{Aeq}$	<30
Adjustment for tonality (reversing beepers)	+2
<b>Highest effective noise level, <math>L_{eff}</math></b>	<b>&lt;30</b>





### 6.3 Mechanical services

At this stage, the mechanical services design has not been completed. Mechanical services equipment associated with the development could include extract fans and heating/ventilation units

Mechanical plant equipment should be carefully selected, sited and attenuated. Proprietary methods of noise control such as the use of low noise equipment, duct attenuators, acoustic enclosures and barriers can be employed individually or in combination in order to reduce noise levels.

The mechanical services have been assumed to be broadly as follows:

- 2 x A/C condenser units
- 1 x Fresh air fan.

### 6.4 Cumulative effective noise level of all on-site activities

The cumulative effective noise level of all on-site activities must comply with SEPP N-1 noise limits for the day, evening, and night-time periods. The predicted cumulative noise levels for the daytime period are provided in Table 7.

**Table 7: Predicted day-time cumulative noise level, dB**

Day-time (all on-site activities)	200-224 Harkness Road
Deliveries and waste collection	<30
Mechanical services	<20
<b>Cumulative effective noise level, <math>L_{eff}</math></b>	<b>&lt;30</b>
SEPP N-1 noise limit	48
<b>Compliance achieved</b>	<b>Yes</b>

Predicted cumulative noise levels for the evening and night period are provided in Table 8.

**Table 8: Predicted evening and night-time noise level, dB**

Evening/Night (all on-site activities)	200-224 Harkness Road
Mechanical services	<20
<b>Cumulative effective noise level, <math>L_{eff}</math></b>	<b>&lt;20</b>
SEPP N-1 noise limit	42/39
<b>Compliance achieved</b>	<b>Yes</b>

The predicted levels outlined in Table 7 and 8 demonstrate that SEPP N-1 compliance is achieved during the evening and night at the nearest residential dwellings.



## 7.0 SEPP N-2 ASSESSMENT

The following sections provide the predicted noise levels from the sources covered under SEPP N-1.

### 7.1 SEPP N-2 limit

The derived SEPP N-2 day and evening music noise limit is outlined in Table 9.

**Table 9: SEPP N-2 derived day and evening noise limit, dB**

Period	SEPP N-2 limit, $L_{Aeq}$
Day	41
Evening	38

The derived SEPP N-2 night-time music noise limits are outlined in Table 10.

**Table 10: SEPP N-2 derived night-time noise limit, dB**

	Octave band centre frequency, Hz						
	63	125	250	500	1000	2000	4000
Night-time noise limit, $L_{10}$	48	43	36	37	33	25	23

### 7.2 Assessment

It is understood that there are to be no external loudspeakers associated with the project and this is affirmed by Condition 11 of the Permit, which states:

11. *No external sound amplification equipment or loudspeakers are to be used for the purpose of announcement, broadcast, playing of music, or similar purpose.*

Therefore, the only source of noise assessable under SEPP N-2 would come from within the building.

Clause 10 of SEPP N-2 states the following:

*Compliance with the requirements of this policy shall be mandatory except in cases where music noise is emitted as a result of recognized religious observance.*

Notwithstanding the above, Condition 12 of the Permit requires that noise from the proposal be assessed against SEPP N-2. It is understood that there is not going to be any music associated with the use and therefore that the only source that this should apply to would be voices inside the premises.

Predicted noise levels from activity within the building during the night, with windows and doors closed, are presented in Table 11.

**Table 11: Predicted internal activity noise levels, dB**

200-224 Harkness Road	Octave band centre frequency, Hz						
	63	125	250	500	1000	2000	4000
Predicted noise level, $L_{10}$	<20	<20	<20	<20	<20	<20	<20
Night-time noise limit, $L_{10}$	48	43	36	37	33	25	23
<b>Compliance?</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>



Internal noise from the proposal is predicted to be in compliance with the applicable SEPP N-2 noise limit during the night. By extension the limits will be met during the day and evening.

The assessment has been undertaken on the assumption that speech within the space will not be amplified (refer Table 21). If it is the case that a sound reinforcement system is used then the internal levels would have to be significantly higher than those detailed in Table 8 in order for the predicted levels at the nearest resident to exceed the relevant limit. This is considered to be an unlikely outcome.





## 8.0 SLEEP DISTURBANCE ASSESSMENT

Noise from night-time activity at the site associated with worshippers' cars and voices have the potential to cause sleep disturbance to residents of neighbouring dwellings.

### 8.1 Sleep disturbance criteria

The NSW EPA document, *NSW Road Noise Policy*, March 2011, undertook a literature review of noise based sleep disturbance studies and found: (p. 35)

*Maximum internal noise levels below 50-55 dB  $L_{Amax}$  are unlikely to cause awakening reactions*

*One or two noise events per night, with maximum internal noise levels of 65-70dB  $L_{Amax}$  are not likely to affect health and wellbeing significantly.*

Conventional dwellings with windows partially open provide approximately 10 dB noise reduction from outside to inside. Therefore, in accordance with the *NSW Road Noise Policy* sleep disturbance findings, it is recommended that maximum noise levels from all on-site activities at night should not exceed 65 dB  $L_{Amax}$  outside an openable window of existing or future residential dwellings.

### 8.2 Assessment

Night-time noise associated with the use of the subject site may comprise:

- Car movements
- Cars braking, doors closing, and accelerating away from a stationary position
- Noise from worshippers talking and laughing in car parking areas

Predicted maximum noise levels from the above activities are provided in Table 12.

**Table 12: Predicted maximum noise levels, dB  $L_{Amax}$**

Activity	200-224 Harkness Road
Normal Car	30
Worst-Case Car	37
Conversation and laughter	33
<b>Compliance achieved</b>	<b>Yes</b>

The above activities meet the sleep disturbance criteria at the affected residential dwellings in the vicinity of the site.



## 9.0 CONCLUSION

Melbourne Islamic Centre Pty Ltd is proposing to develop a place of worship at 171-197 Harkness Road in Melton West.

Reeds Consulting Pty Ltd have engaged MDA to undertake an assessment of noise from the proposal.

MDA has carried out an environmental noise assessment of the proposed renovation in accordance with the relevant Victorian EPA legislation, guidelines and accepted industry practice.

This assessment has been based on:

- Existing noise conditions determined from measurement surveys at the site;
- Limits determined in accordance with the relevant Victorian EPA legislation, guidelines and accepted industry practice; and
- Detailed 3-dimensional modelling of the site and surrounding environment, accounting for typical worst-case atmospheric conditions which favour the propagation of noise.

Mechanical plant equipment should be carefully selected, sited and attenuated. Proprietary methods of noise control such as the use of low noise equipment, duct attenuators, acoustic enclosures and barriers can be employed individually or in combination in order to reduce noise levels. It is recommended that all mechanical services equipment be located on the north side of the building.

The assessment has been undertaken on the assumption that speech within the space will not be amplified (refer Table 21). If it is the case that a sound reinforcement system then the internal levels would have to be significantly higher than those detailed in Table 22 in order for the predicted levels at the nearest resident to exceed the relevant limit. This is considered to be an unlikely outcome.

The assessment has shown that the proposal can meet all the relevant noise requirements without the need for additional noise mitigation measures.

**APPENDIX A GLOSSARY OF TERMINOLOGY**

<b>A-weighting</b>	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
<b>dB</b>	Decibel The unit of sound level.
<b>L<sub>A90</sub></b>	The noise level exceeded for 90% of the measurement period, measured in dB. This is commonly referred to as the background noise level.
<b>L<sub>A10</sub></b>	The noise level exceeded for 10% of the measurement period, measured in dB
<b>L<sub>Aeq</sub></b>	The equivalent continuous sound level. This is commonly referred to as the average noise level and is measured in dB.
<b>L<sub>Amax</sub></b>	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
<b>L<sub>w</sub> (or SWL)</b>	Sound Power Level. The level of total sound power radiated by a sound source.
<b>Sound Insulation</b>	When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to ability of a material to stop sound travelling through it.
<b>R<sub>w</sub></b>	<u>Weighted Sound Reduction Index</u> A single number rating of the sound insulation performance of a specific building element. R <sub>w</sub> is measured in a laboratory. R <sub>w</sub> is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete.



## APPENDIX B UNATTENDED MEASUREMENTS

Background noise levels were measured at the southern side of the site using a 01dB DUO precision integrating sound level meter fitted with a windshield.

The microphone was mounted on a pole at a height of approximately 1.5 m above local ground level under freefield conditions. A photograph of the noise monitor in situ is presented as Figure 6 and the measurement location is shown in Figure 7.

**Figure 6: Unattended noise monitoring location**



Measurements were obtained using the 'F' response time and A-weighting frequency network. The equipment was checked before and after the survey and no significant calibration drifts were observed.

Consecutive measurements of background noise were obtained between 1230 hrs on Monday 12 and 1200 hrs on Wednesday 14 October 2015.

The prevailing noise environment was typical of a rural situation with occasional aircraft overflights.

Measured noise levels are summarised in Table 13 and are presented graphically in Appendix C.

**Table 13: Measured background noise levels**

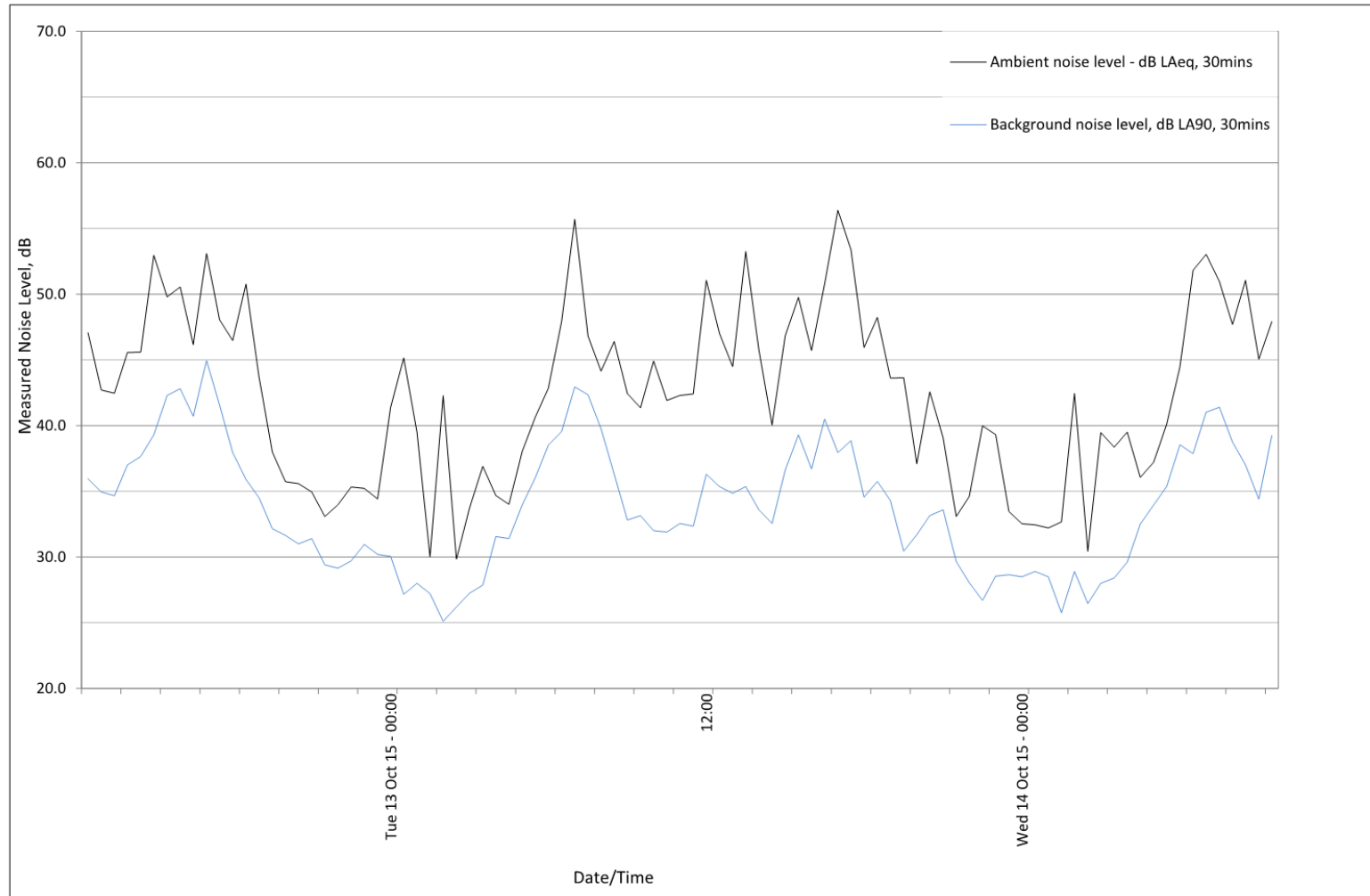
Period	Average Background Noise Level, $L_{A90}$ dB		
	Day	Evening	Night
Monday, 12 Oct 2015	-	33	31
Tuesday, 13 Oct 2015	36	33	30
Wednesday, 14 Oct 2015	38	-	-
<b>Minimum</b>	<b>36</b>	<b>33</b>	<b>30</b>

Figure 7: Unattended noise monitoring location





**APPENDIX C NOISE MONITORING RESULTS**







## APPENDIX D LEGISLATION AND GUIDELINES

### D1 SEPP N-1

#### D1.1 Application

*State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (SEPP N-1) sets noise limits that apply to commercial, industrial and trade premises within the Melbourne metropolitan region. Compliance with SEPP N-1 is mandatory under section 46 of the Environment Protection Act 1970.

SEPP N-1 defines a 'commercial, industrial and trade premises' as:

*any premises except:*

*(a) residential premises as defined in section 48A of the [Environment Protection] Act;*

*(b) a street or road, including every carriageway, footpath, reservation and traffic island on any street or road;*

*(c) a tram, light rail or railway line not being a siding, marshalling yard or maintenance depot of any tram, light rail or railway line; and*

*(d) [land situated at Luna Park, St Kilda].*

*Section 48A of the Act defines residential premises as:*

*any building or part of a building used as or for the purposes of a private residence or residential flat.*

#### D1.2 Assessment methodology

SEPP N-1 is a policy and technical document. The Policy prescribes the methodology and measurement procedure used to determine applicable noise limits and assessment of compliance.

The Policy requires that proposed commercial premises be designed to comply with SEPP N-1 noise limits. Clause 16 of the Policy states:

*Where it is planned to develop new commercial, industrial or trade premises, the premises shall be designed so that the noise emissions do not exceed the noise limits*

Further, the occupier of commercial, industrial or trade premises has an ongoing obligation to meet the SEPP N-1 noise limits. Clause 15 of the Policy states:

*where noise emissions from existing commercial, industrial or trade premises exceed the requirements set out in the Policy, steps shall be taken by the occupier to reduce the level of these noise emissions to, or below, the relevant Policy noise limits.*

SEPP N-1 defines a 'noise sensitive area' as an area of land within 10m outside the external walls of:

*a dwelling or residential building*

*a dormitory, ward or bedroom of a caretaker's house, hospital, hotel, institutional home, motel, reformative institution, tourist establishment or work release hostel.*

The assessment of noise from the subject site under SEPP N-1 is based on the calculation of a noise limit at a receiver position, taking into account a zoning noise level derived from the land zoning types in the surrounding area and the background noise level.

Once a noise limit is established, the noise level ( $L_{Aeq}$ ) due to the commercial premises is measured or predicted. If necessary, the  $L_{Aeq}$  noise level is adjusted for noise character and duration to give the effective noise level ( $L_{eff}$ ). If the  $L_{eff}$  level exceeds the noise limit, then remedial action is required.



### D1.3 Calculation of noise limits

SEPP N-1 noise limits are calculated taking into account land 'zoning types' within a 70 m and 200 m radius of a noise sensitive building. Zoning types are categorised as type 1, 2 or 3.<sup>1</sup> A prescribed formula is used to calculate a corresponding Zoning Level. In general, zone type designations are as follows.

- areas such as residential, rural and open space are type 1;
- areas such as commercial, business and light industry are type 2; and
- areas such as general industry and major roads are type 3.

Greater areas of type 2 and 3 land within a 200 m radius of a noise sensitive site result in higher Zoning Levels than a site with respectively larger areas of type 1 land.

The SEPP N-1 Noise Limit is equal to the 'zoning level' unless the background level at the noise sensitive site is categorised as low or high according to Clause B3 of the Policy. If the background level is low or high, the Noise Limit is calculated from a formula taking into account the Zoning Level and the Background Level.

The limits are separately defined for the day, evening and night periods as defined in Table 14. The measured background noise levels have been based on the lowest of the day evening and night periods collected during the unattended survey.

**Table 14: SEPP N-1 time periods and noise limits**

Period	Day of week	Start time	End time	Measured background, L <sub>A90</sub> dB	Zoning level, dB	Background relative to zoning level	Noise limit, L <sub>eff</sub> dB
Day	Monday-Friday	0700hrs	1800hrs	36	50	Low	48
	Saturday	0700hrs	1300hrs				
Evening	Monday-Friday	1800hrs	2200hrs	33	44	Low	42
	Saturday	1300hrs	2200hrs				
	Sunday, Public holidays	0700hrs	2200hrs				
Night	Monday-Sunday	2200hrs	0700hrs	30	39	Neutral	39

<sup>1</sup> EPA Publication no.: 316a, 17 February 2000, *Designation of Types of Zones and Reservations in the Metropolitan Region Planning Schemes for the Purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* <<http://www.epa.vic.gov.au/our-work/publications/publication/2000/february/316a>>

**D2 SEPP N-2**

Music noise from entertainment venues is controlled by *State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2* (SEPP N-2). Compliance with SEPP N-2 is mandatory under section 46 of the Environment Protection Act 1970.

Clause 20 of SEPP N-2 provides that:

*Where the level of music noise from indoor or outdoor venues exceeds the noise limit, steps shall be taken by the occupier to reduce those levels to, or below, the noise limit.*

SEPP N-2 sets noise limits that must be achieved in a 'noise sensitive area'. The Policy defines a noise sensitive area as:

*(a) that part of the land within the apparent boundaries of any piece of land which is within a distance of 10 metres outside the external walls of any of the following buildings:*

- *Dwelling (except Caretaker's House), [or] Residential Building.*

*(b) that part of the land within the apparent boundaries of any piece of land on which is situated any of the following buildings which is within a distance of 10 metres outside the external walls of any dormitory, ward or bedroom of such buildings:*

- *Caretaker's house, Hospital, Hotel, Institutional Home Motel, Reformatory Institution, Tourist Establishment, Work Release Hostel.*

For indoor venues, SEPP N-2 sets noise limits as shown in Table 15.

**Table 15: SEPP N-2 criteria (music on more than 3 nights per week)**

Time period	Noise limit
Day/Evening Saturday 1000 - 2200hrs Sunday 1200 - 2100hrs Other 0900 - 2200hrs	Music noise ( $L_{Aeq}$ ) not permitted to exceed background noise ( $L_{A90}$ ) plus 5dB
Night Saturday 2200 - 1200hrs Sunday 2100 - 0900hrs Other 2200 - 0900hrs	Music noise ( $L_{OCT10}$ ) is not permitted to exceed the background noise level ( $L_{OCT90}$ ) by more than 8dB in any octave band (63Hz-4kHz) at a noise-sensitive area

The derived SEPP N-2 day and evening music noise limit is outlined in Table 9.

**Table 16: SEPP N-2 derived day and evening noise limit, dB**

Period	Measured background noise level, $L_{90}$	SEPP N-2 limit, $L_{Aeq}$
Day	36	41
Evening	33	38

The derived SEPP N-2 night-time music noise limits are outlined in Table 10.

**Table 17: SEPP N-2 derived night-time noise limit, dB**

	Octave band centre frequency, Hz						
	63	125	250	500	1000	2000	4000
Measured background noise level, $L_{90}$	40	35	28	29	25	17	15
	+8	+8	+8	+8	+8	+8	+8
Night-time noise limit, $L_{10}$	48	43	36	37	33	25	23

**D3 Industrial Waste Collection**

EPA (Vic) publication no.: 1254, *Noise Control Guidelines* (Guidelines) provides the following recommendations for industrial waste collections:

- Refuse bins should be located at sites that provide minimal annoyance to residential premises
- Compaction should be carried out while the vehicle is moving
- Bottles should not be broken up at the collection site
- Routes which service predominantly residential areas should be altered regularly to reduce early morning disturbances
- Noisy verbal communication between operators should be avoided where possible.

The Guidelines recommend that collections should be restricted to the following times:

One collection per week

6:30am-8pm Monday to Saturday

9am-8pm Sunday and Public Holidays

Two or more collections per week

7am-8pm Monday to Saturday

9am-8pm Sunday and Public Holidays.

**D4 Deliveries**

EPA (Vic) publication no.: 1254, *Noise Control Guidelines* states the following concerning store deliveries:

*Where a residential area will be impacted by noise from deliveries, the deliveries should be inaudible in a habitable room of any residential premises (regardless of whether any door or window giving access to the room is open) outside the hours contained in the schedule*

*Schedule: Deliveries to shops, supermarkets & service stations*

*7am-10pm Monday to Saturday*

*9am-10pm Sunday and Public Holidays.*

**D5 Sleep Disturbance**

The NSW Road Noise Policy 2011 produced by the NSW EPA, provides guidance on potential for sleep disturbance. While the Policy applies strictly only in NSW, the provisions of the document are often referred to in Victoria for general guidance on potential sleep disturbance.

The NSW policy notes that from the research on sleep disturbance to date it can be concluded that:

- *maximum internal noise levels below 50–55 dB  $L_{Amax}$  are unlikely to awaken people from sleep*
- *one or two noise events per night, with maximum internal noise levels of 65–70 dB  $L_{Amax}$  are not likely to affect health and wellbeing significantly.*





## APPENDIX E NOISE DATA

Manufacturers' noise level data and information gathered from previous noise surveys conducted by MDA have been used to predict noise levels at the subject site.

Noise level data used in our assessment is provided below.

### 9.1 Deliveries and waste collection

The following provides MDA's vehicle definitions used in the predictions:

- 10+ tonne truck: Semi-trailer
- Light rigid vehicle (LRV): less than 4 tonne capacity and up to 6.4 m long (includes delivery vans).

Noise levels of delivery truck movements including waste removal at similar sites have previously been measured by MDA. The results of these measurements are summarised in Table 4.

**Table 18: Sound power level of delivery and waste collection, vehicles and activities,  $L_{eq}$  dB**

Source	Octave band centre frequency (Hz)							
	A	63	125	250	500	1000	2000	4000
Light Rigid Vehicle (LRV) pass by	93	93	91	89	89	89	86	79
10+ tonne truck pass by (e.g. Waste collection)	106	109	111	106	101	99	98	97

The following deliveries and waste collections are anticipated that occur at the subject site:

- 5-6 deliveries per week by a LRV (small delivery)
- 2-3 waste collections per week by a 10+ tonne truck (waste collection).

### 9.2 Worshipper activities

Worshipper activities on this site will consist of cars using the parking areas, braking, doors closing, start-up and accelerating, as well as conversation and laughter.

MDA have calculated maximum sound power levels from numerous noise surveys and provide a summary in Table 5 below.

**Table 19: Maximum sound power level of vehicle movements and worshipper activities,  $L_{max}$  dB**

Source	Octave band centre frequency (Hz)							
	A	63	125	250	500	1000	2000	4000
'Normal' car (includes door close and vehicle start-up)	95	110	103	96	90	87	85	82
'Worst-case' car (includes door close and vehicle start-up)	103	111	109	105	99	97	93	93
Conversation and laughter	98	62	71	87	91	95	91	85

For the data presented in Table 19 a 'worst-case' car includes a V8 or high-powered vehicle driving in an aggressive manner.



### 9.3 Typical Mechanical Services Equipment

At this stage, the mechanical services design has not been completed. Mechanical services equipment associated with the development could include extract fans and heating/ventilation units

Mechanical plant equipment should be carefully selected, sited and attenuated. Proprietary methods of noise control such as the use of low noise equipment, duct attenuators, acoustic enclosures and barriers can be employed individually or in combination in order to reduce noise levels. It is recommended that all mechanical services equipment be located on the north side of the building

Typical sound power levels for mechanical services equipment are shown in Table 20.

**Table 20: Sound power levels of mechanical services, dB**

Noise Source	A-weighted sound power level
A/C condenser unit	81
Fresh air fan	79

### 9.4 Typical internal noise levels

MDA has undertaken a high-level literature review of papers relating to internal noise levels within mosques.

In general, internal activities can be broken down into two main activities, as follows:

- Prayers: involves the recital of prayers either individually or as a group
- Preaching: worshippers are seated on the floor whilst the Imam delivers the Khutba or preaches from a raised platform.

Internal noise levels vary significantly due to the differing sizes of mosques across the world. Typically, however it would appear that the recitation of the Qur'an generates the highest noise levels, up to 90 dB in one instance, however the number of persons present in the prayer room at the time of the measurements is unknown.

A paper by Hayne, Taylor, Rumble and Mee entitled *Prediction of Noise from small to medium sized crowds* was presented at Acoustics 2011 and provides a formula for prediction of crowds up to 100 people.

The overall noise level for worshippers within the prayer room of the development has been derived from the formulae proposed by Hayne, Taylor, Rumble and Mee and is shown below:

$$L_{wAeq} = 15 \log N + 64 \text{ dB}$$

$$L_{wAmax} = 11 \log N + 81 \text{ dB}$$

Where: N = the number of worshippers.

The spectral data has been derived from measurements made by MDA and the worshipper noise level data used for predictions is presented in Table 21. The number of patrons has been taken from Condition 8 of the permit.

**Table 21: Worshipper noise level data, dBW**

Description	Parameter	Octave Band Centre Frequency, Hz							
		63	125	250	500	1000	2000	4000	A
Prayer Room (60 Persons)	$L_{eq}$	79	81	82	89	87	83	76	91
	$L_{max}$	66	75	91	95	99	95	89	101



It is understood that the mosque will have one prayer room and therefore it is considered reasonable to assume that there will be times when the prayer room will be at full capacity. The drawings show that the main prayer room is to be approximately 19 m long, 14 m wide and 5.4 m high. Based on the assumption that the floor will be covered with thick carpet then the predicted internal noise levels are 74 dB  $L_{Aeq}$  and 85 dB  $L_{Amax}$ .

Night-time noise limits in accordance with SEPP N-2 are defined with reference to the  $L_{10}$  parameter. In general, the  $L_{10}$  is 3 dB higher than the  $L_{eq}$  measured over the same period. Therefore, the spectra detailed in Table 22 has been used as the input for the night-time period.

**Table 22: Internal reverberant sound pressure level during the night**

Description	Parameter	Octave Band Centre Frequency, Hz							
		63	125	250	500	1000	2000	4000	A
Prayer Room (60 Persons)	$L_{10}$	65	67	68	75	73	69	62	77