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**CLARITY**  
ACOUSTICS



Report R01 25107

13 November 2025

438-440 Barkly Street, Footscray  
Planning Application Acoustic Report

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PROJECT SUMMARY:

R01 25107

438-440 Barkly Street, Footscray

Childcare Centre Planning Application

Acoustic Report

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## 1.0 INTRODUCTION

It is proposed to develop a new 116-place childcare centre with parking for 25 cars at 438-440 Barkly Street, Footscray (subject site). Clarity Acoustics Pty Ltd (Clarity Acoustics) has been engaged by Babwest Property Group to prepare an acoustic report to be submitted as part of the planning application for the proposed childcare centre.

This report provides details of the proposed childcare centre operations, measurements of background noise levels in the vicinity of the subject site, relevant noise criteria applicable to the operation of the childcare centre, recommended noise controls and an assessment of operational noise from the childcare centre.

A glossary of acoustic terminology used in this report is provided in APPENDIX A.

## 2.0 PROJECT DESCRIPTION

### 2.1 Subject site

The subject site is located at 438-440 Barkly Street, Footscray and is bounded by the following:

- Barkly Street to the south with commercial uses beyond
- Eleanor Street to the west with dwellings beyond
- Dwellings on Eleanor Street and Everard Street to the north
- Everard Street to the east with dwellings beyond .

The subject site is located within a General Residential Zone 3 (GRZ3) with further GRZ3 and Transport Zone 3 – Significant Municipal Road (TRZ3) in the immediate environs. The relevant planning map for the subject site is provided in APPENDIX B.

### 2.2 Nearest noise sensitive receivers

The nearest noise sensitive receivers are dwellings on Barkly Street to the east and west of the subject site and on Eleanor Street and Everard Street to the north of the subject site. Table 1 provides details of the nearest noise sensitive receivers that have been considered representative for the purpose of our assessment.

**Table 1 - Nearest noise sensitive receivers**

ID	Address	Description
R1	454 Barkly Street	Single storey dwelling to the west of the subject site
R2	126 Eleanor Street	Single storey dwelling to the west of the subject site
R3	124 Eleanor Street	Single storey dwelling to the north-west of the subject site on land which is proposed to be subdivided into four lots. Double storey dwellings have been assumed for the subdivided lots
R4	113 Eleanor Street	Single dwelling to the north of the subject site with a high-level clerestory window
R5	76 Everard Street	Single storey dwelling to the north of the subject site
R6	71 Everard Street	Single storey dwelling to the north-east of the subject site
R7	436 Barkly Street	Single storey dwelling to the east of the subject site

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

**Figure 1 - Aerial photograph of the subject site and surrounds (image source: Nearmap)**



### 2.3 Proposed childcare centre operation

The proposed three storey childcare centre will cater for up to 116 children with approximately 891 m<sup>2</sup> of outdoor play area. Parking for 25 cars is to be provided on the ground level with access via Eleanor Street and Everard Street. Activity rooms and external play areas associated with the childcare centre are to be located on the first and second level of the centre. The proposed site layout is provided in APPENDIX C.

It is proposed that the childcare centre will operate between 0630-1830 hours, Monday to Friday. The anticipated age distribution of the 116 children that will attend the centre is outlined in Table 2.

**Table 2 - Anticipated age distribution of children attending childcare centre**

Age group	Number of children
0-2 years	56
2-3 years	16
3-5 years	44

### 3.0 RELEVANT GUIDELINES AND CRITERIA

The following table provides a summary of the key noise legislation and related guidelines and standards commonly referenced in Victoria which are relevant to childcare centres.

**Table 3 – Relevant legislation and standards**

Legislation/ Guideline	Description
Environment Protection Act 2017 (the Act)	Legislative framework for the protection of the environment in Victoria that establishes obligations for environmental noise control.
Environment Protection Regulations 2021 (S.R. No. 47/2021)	The Environment Protection Regulations set out the framework for noise from residential, commercial, industrial and trade premises as well as from indoor and outdoor entertainment venues and events. The Regulations require that noise levels from commercial, industrial and trade premises and indoor and outdoor entertainment venues and events are set to protect noise sensitive areas from unreasonable noise.
Association of Australasian Acoustical Consultants <i>Guideline for Child Care Centre Acoustic Assessment</i> (AAAC Guideline)	<p>The AAAC Guideline relating to childcare centres provides criteria to be used for the assessment of noise from children in outdoor play areas associated with childcare centres impacting on nearby noise sensitive receivers.</p> <p><b>Noise from outdoor play areas:</b></p> <p>The guideline outlines design criteria for outdoor play areas based on the duration of play nominating an emergence of 10 dB above the background noise level (<math>L_{A90, 15 \text{ min}}</math>) for up to four hours of play per day and an emergence of 5 dB above the background noise level for more than 4 hours of play per day.</p> <p>Childcare centres typically no longer limit outdoor play times, therefore, criteria based on limiting outdoor play are not considered relevant. Several other issues with the implementation of the AAAC design criteria have been identified by Clarity Acoustics (and other acoustic consultants in Victoria) which are summarised below for reference:</p> <ul style="list-style-type: none"> <li>• In most contexts a <math>L_{A90} + 5 \text{ dB}</math> criterion results in more stringent criteria applicable to noise from children in outdoor play than would apply to noise from industrial/commercial premises</li> <li>• The <math>L_{A90} + 5 \text{ dB}</math> criterion does not consider that noise from children in outdoor play does not have the same character as other forms of environmental noise such as industrial noise or music from licensed venues</li> <li>• The <math>L_{A90} + 5 \text{ dB}</math> criterion can result in very onerous mitigation measures such as noise barriers that are excessive in height and not consistent with visual amenity</li> <li>• The nominated criteria do not account for other factors such as duration of exposure, character of the noise etc., which can all influence noise impact.</li> </ul> <p>A review of relevant VCAT decisions demonstrates that noise from children in outdoor play areas associated with childcare centres is considered to be consistent with residential amenity and that a <math>L_{A90} + 10 \text{ dB}</math> approach is appropriate in the majority of circumstances. Accordingly, the assessment outlined in subsequent sections compares the predicted noise levels from outdoor play areas associated with the development against a 10 dB margin above the existing background noise levels. A summary of relevant VCAT decisions is provided in APPENDIX D.</p>

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**Extraneous noise:**

The AAAC guideline recommends that the noise level  $L_{Aeq, 1hour}$  from road, rail traffic or industry at any location within the outdoor play or activity area during the hours when a centre is operating shall not exceed 55 dB and not exceed 40 dB within the indoor play areas and 35 dB in sleeping areas associated with child care centres.

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EPA Publication 1826-4  
*Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*  
(Noise Protocol)

The Noise Protocol outlines the EPA's approach to the determination of noise limits and to the measurement, prediction and analysis of noise.

Part I of the Noise Protocol outlines the methodology to establish noise limits applicable to noise from commercial, industrial or trade premises in both urban and rural areas of Victoria. The calculation of noise limits for commercial, industrial and trade premises in urban areas takes into account a zoning noise level, which is based on the land zoning types in the surrounding 200 metre radius of the noise sensitive area, and the background noise level in the vicinity of the relevant noise sensitive areas.

Operational noise levels from the subject site noise sources covered under the Noise Protocol must comply with the noise limits derived under Part I of the Noise Protocol.

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Environment  
Reference Standard  
(ERS)

The ERS describes the environmental values of the ambient sound environment that are sought to be achieved and maintained in Victoria. The ERS also sets out objectives and indicators for ambient sound based on land use settings that can be measured to determine whether the environmental values are being met.

The ERS is a reference instrument, not a compliance standard. It has no direct regulatory force but may be considered as part of the decision-making process by local government and other decision-making authorities in their consideration of activities that are not directly regulated under the Noise Regulations.

It should be noted that direct regulation takes precedence over the ERS i.e., the ambient sound indicators are not relevant when considering noise in relation to commercial, industrial or trade premises.

In this instance, the ERS may be relied upon in relation to noise from vehicle movements within the carpark which is specifically excluded from the Regulations.

The land use category and associated indicators and objectives set out in the ERS that are considered relevant to the dwellings near the proposed development are 50 dB  $L_{Aeq, 16\text{ hour (0600-2200 hours)}}$  (i.e., Category III).

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NSW Road Noise Policy    The NSW Environmental Protection Authority (EPA) conducted a review of sleep disturbance studies the results of which are outlined in the NSW EPA's Road Noise Policy (RNP). The NSW EPA 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.

An open window provides an approximate noise reduction of 10-15 dB from outside to inside (refer to World Health Organisation guidelines and RNP). Therefore, noise levels from early morning/night-time activity associated with the childcare centre car park should not exceed 65 dB  $L_{Amax}$  external to bedrooms of the nearest dwellings.

Although compliance with the sleep disturbance criteria is not a legislative requirement in Victoria, it is often referenced as a guide in terms of early morning activities.

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#### 4.0 EXISTING NOISE ENVIRONMENT

As outlined in Table 3 above, environmental noise criteria for the proposed development are set accounting for existing background noise levels in the vicinity of the proposed use. Accordingly, attended measurements of background noise levels were undertaken at the subject site between 0630 hours and 0730 hours and between 1430 hours and 1500 hours on Tuesday, 14 October and between 1800 hours and 1830 hours on Wednesday, 15 October 2025. Measurements of traffic noise levels at the subject site were also conducted concurrently.

The noise measurements were conducted using a Class 1 Sound and Vibration Analyser (Svantek 977 – serial number 59804) at the rear of the subject site with the microphone located at approximately 1.5 m above ground level. Refer to Figure 2 for the noise measurement position in relation to the subject site.

**Figure 2 – Noise measurement position (image source: Nearmap)**



The equipment was checked before and after the noise survey using a Svantek Class 1 Acoustic Calibration (serial number 58085) and no significant calibration drifts were observed.

The measured background noise levels and traffic noise levels relevant to the proposed operating hours of the childcare centre are detailed in Table 4.

**Table 4 – Measured lowest daily average background noise levels**

Period	Time Period (relevant to subject site operating hours)	Measured background noise level, dB L <sub>A90</sub> , 15 minute	Measured traffic noise level, dB L <sub>Aeq</sub> , 30 minute
Early morning	0630-0700 hours	50	55
Day	0700 – 1800 hours	49	55
Evening	1800 – 1830 hours	50	55

## 5.0 ACOUSTIC SCREENING TO CARPARK AND OUTDOOR PLAY AREAS

In order to enable compliance with the environmental noise criteria, a perimeter acoustic fence will be required to the northern interface of the subject site. The acoustic fence proposed is to be 1.9 m high (relative to the Finished Surface Level (FSL) of the car park). The extent of acoustic screening required to the carpark is provided in Figure 3 below.

**Figure 3 – Proposed acoustic fencing to ground floor**



In addition, 1.8 m high (relative to FFL) solid glass balustrades are proposed to the outdoor play areas.

To provide adequate noise attenuation, the construction material of the proposed acoustic fence and balustrades must have a minimum surface density of 12 kg/m<sup>2</sup> and be free from holes and gaps. Where timber acoustic fencing is preferred, 25 mm thick plywood timber panelling will meet the minimum surface density specification. Materials such as 9 mm thick fibre cement sheet, 6 mm thick float glass, proprietary acoustic panels or any other approved material which meets the minimum surface density specification of 12 kg/m<sup>2</sup> may also be used.

If a material which meets the above acoustic requirements and does not restrict light is required, 12 mm thick Perspex or 6 mm thick float glass can be used.

Where a perforated finish or batten screen finish is preferred such as metal or timber perforated balustrades or a timber look batten screen, the chosen finish will require a solid backing such as 12 mm thick Perspex or 6 mm thick glass or any other approved material which material which meets the minimum surface density specification.

## 6.0 ASSESSMENT OF NOISE FROM CHILDREN PLAYING OUTDOORS

Noise levels from the subject site have been calculated using the proprietary noise modelling software SoundPLAN v9.1 which implements International Standard ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors* (ISO 9613-2). Noise levels from children playing in the outdoor play areas associated with the childcare centre are calculated considering the following:

- Source noise levels for children playing outdoors taken from the AAAC guideline as outlined in Table 5
- Assumed number of children using the proposed outdoor play areas simultaneously as outlined in Section 6.3
- Attenuation of noise provided by distance between the source and receivers, any intervening screening structures and the built form of the development including the recommended acoustic fencing and screening to the outdoor play areas as outlined in Section 5.0
- Reflections from built form, adjacent buildings, screening structures and the ground surface
- The noise prediction methodology outlined in APPENDIX E.

The following sections detail the source noise data used in our noise model, outline the noise targets applicable to the outdoor play areas associated with the childcare centre and compare the predicted noise levels from children in the outdoor play areas with the relevant noise criteria.

### 6.1 Noise source data

The AAAC guideline provides typical sound power levels for groups of 10 children playing within different age groups. The AAAC sound power level data for groups of 10 children in active play and the anticipated age distribution of the 116 children that will attend the centre is provided in Table 5.

**Table 5 – Children age distribution and AAAC effective sound power level per group of 10 children**

Age group	Number of children	AAAC Sound Power Level per group of 10 children playing (dB)
0-2 years	56	78
2-3 years	16	85
3-5 years	44	87

The AAAC guideline also notes that an adjustment of -6 dB can be applied to the above sound power levels for children involved in passive play.

## 6.2 Noise criteria

Based on the discussion in Section 3.0 and APPENDIX D and the background noise levels provided in Table 4, the design criteria for noise from children in outdoor play areas associated with the subject site are summarised in Table 6.

**Table 6 – Noise criteria for outdoor play areas, dB**

Period	Time Period	Noise criteria, $L_{Aeq, 15 \text{ min}}$
Early morning	0630-0700 hours	60
Day	0700-1800 hours	59
Evening	1800-1830 hours	60

## 6.3 Predicted noise levels

Predictions of noise levels from children in the outdoor play areas are based on the following:

- Up to 75 % of the children attending the centre (87 children) being outside in active play at the same time during the day period (0700-1800 hours)
- Up to 25 % of the children attending the centre (29 children) being outside in active play at the same time during the early morning and evening periods (0630-0700 hours and 1800-1830 hours)
- A source height of 1 m (AGL) for all age groups as recommended by the AAAC guideline.

This is considered a conservative estimate and in practice, external playtimes will be staggered, typical percentages of children playing outside simultaneously are generally lower than those used in this assessment and some children will be engaged in passive play. In addition, children are unlikely to be playing outside during the early morning and evening periods as these are likely to coincide with dropoff and pickup, however, the predictions have been provided as a conservative approach.

The predicted noise levels from children engaged in active play in the outdoor play areas associated with the childcare centre are provided in Table 7 and Table 8 and account for the proposed built form and balustrades of the subject site as well as the acoustic fencing detailed in Section 5.0.

**Table 7 - Predicted noise levels - children in outdoor play areas (Day), dB**

Receiver	Predicted noise level from outdoor play areas, $L_{Aeq, 15 \text{ min}}$	Criteria (Day), $L_{Aeq, 15 \text{ min}}$	Compliance?
454 Barkly Street	36	59	Yes
126 Eleanor Street	37	59	Yes
124 Eleanor Street	40	59	Yes
113 Eleanor Street	44	59	Yes
76 Everard Street	41	59	Yes
71 Everard Street	38	59	Yes
436 Barkly Street	37	59	Yes

**Table 8 - Predicted noise levels - children in outdoor play areas (Early morning/Evening), dB**

Receiver	Predicted noise level from outdoor play areas, $L_{Aeq,15\text{ min}}$	Criteria (Early morning/Evening), $L_{Aeq,15\text{ min}}$	Compliance?
454 Barkly Street	31	60	Yes
126 Eleanor Street	33	60	Yes
124 Eleanor Street	35	60	Yes
113 Eleanor Street	39	60	Yes
76 Everard Street	37	60	Yes
71 Everard Street	34	60	Yes
436 Barkly Street	33	60	Yes

The noise levels from children playing within the outdoor play areas associated with the proposed childcare centre are predicted to comply with the nominated noise criteria at the nearest noise sensitive receivers with the incorporation of the proposed balustrades and acoustic fencing outlined in Section 5.0.

## 7.0 ASSESSMENT OF TRAFFIC NOISE IMPACTS

### 7.1 Traffic noise impacts on proposed childcare centre

As outlined in Table 3, the proposed childcare centre should be designed for traffic noise levels to not exceed 55 dB  $L_{Aeq,1\text{ hour}}$  within outdoor play areas, 40 dB  $L_{Aeq,1\text{ hour}}$  within the indoor activity areas and 35 dB  $L_{Aeq,1\text{ hour}}$  in sleeping areas.

The highest measured external traffic noise level of 55 dB  $L_{Aeq,1\text{ hour}}$  has been used to calibrate the noise model to predict traffic noise levels at most exposed facade of the childcare centre building. Based on the worst-case predicted traffic noise levels at the most exposed facades of the childcare centre building, compliance with the indoor criteria of 40 dB  $L_{Aeq,1\text{ hour}}$  in indoor activity areas and compliance with the indoor criteria of 35 dB  $L_{Aeq,1\text{ hour}}$  in sleeping areas associated with the childcare centre can be readily achieved by conventional facade construction.

Based on the highest measured traffic noise level of 55 dB  $L_{Aeq,1\text{ hour}}$  at the north site boundary of the subject site and the shielding that will be provided to the outdoor play area by the built form and balustrades of the childcare centre building, the 55 dB  $L_{Aeq}$  requirement will be met within the outdoor play areas.

### 7.2 ERS assessment from use of the car park

An assessment of noise from non-commercial vehicles is specifically excluded under the Regulations/Noise Protocol. As such, as outlined in Section 3.0, noise associated with the use of the proposed car park has been assessed against the ERS objectives for the area.

Noise from the proposed car park has been modelled in SoundPLAN using methods prescribed in the Bavarian State Office for the Environment's *Parking Area Noise* (BayLfU, 2007). Noise from the car park has been modelled based on 25 parking bays and all 116 children arriving or leaving in separate vehicles which is considered a conservative approach.

The calculated noise levels due to vehicle movements associated with childcare centre carpark are presented in Table 9.

**Table 9 - Predicted noise levels – carpark area, dB**

Receiver	Predicted noise level from carpark area, $L_{Aeq,16\text{ hour}}$	ERS objective $L_{Aeq,16\text{ hour}}$	Compliance?
454 Barkly Street	28	50	Yes
126 Eleanor Street	30	50	Yes
124 Eleanor Street	27	50	Yes
113 Eleanor Street	32	50	Yes
76 Everard Street	27	50	Yes
71 Everard Street	27	50	Yes
436 Barkly Street	28	50	Yes

The noise levels from carpark area associated with the proposed childcare centre are predicted to comply with the relevant ERS objective at all nearby properties.

### 7.3 Sleep disturbance assessment from the use of the car park

As outlined in Section 3.0, maximum noise levels from the use of the car park should not exceed the sleep disturbance criterion of 65 dB  $L_{Amax}$  outside openable windows of neighbouring dwellings during the early morning period (0630-0700 hours).

Noise associated with the use of the car park during the early morning period could include car movements within the car park, cars braking, doors closing and patron voices. Predicted maximum noise levels from the above activities are outlined in Table 10 below. A summary of the sound power level data used in our assessment of sleep disturbance from early morning activities associated with the subject site car park is provided in APPENDIX E.

**Table 10 – Predicted maximum noise levels from early morning activity at nearby receivers, dB  $L_{Amax}$** 

Receiver	Normal car <sup>1</sup>	Voices <sup>2</sup>	Car pass by	Compliance with 65 dB $L_{Amax}$ ?
454 Barkly Street	56	59	54	Yes
126 Eleanor Street	60	64	58	Yes
124 Eleanor Street	60	63	58	Yes
113 Eleanor Street	61	64	59	Yes
76 Everard Street	56	63	54	Yes
71 Everard Street	53	57	51	Yes
436 Barkly Street	54	56	52	Yes

Note 1 – A car being driven in a normal manner. Includes car braking and door closing. Given the nature of the development, noise events from worst case cars (i.e., a V8 or high-powered vehicle being driven in an aggressive manner) in the early morning period have been excluded from our assessment.

Note 2 – Based on a worst-case scenario of a shouting voice.

It can be seen from Table 10, that the maximum noise levels from the early morning use of the car park are predicted to comply with the sleep disturbance criterion of 65 dB  $L_{Amax}$  at the nearest noise sensitive receivers.

## 8.0 ASSESSMENT OF NOISE FROM MECHANICAL PLANT

Noise from mechanical plant associated with the childcare centre will need to be designed to be compliant with the Noise Protocol noise limits at the nearest noise sensitive receivers. Noise limits applicable to the operation of mechanical plant associated with the childcare centre have been calculated in accordance with Part I of the Noise Protocol and are provided in Table 11.

**Table 11 – Noise Protocol noise limits, dB**

Period	Time Period	Noise Protocol noise limit, $L_{eff}$
Early morning	0630-0700 hours	53
Day	0700-1800 hours	55
Evening	1800-1830 hours	53

At this stage, the mechanical services plant selections have not been undertaken for the development. It is recommended that a detailed assessment of noise associated with the mechanical plant is undertaken once the plant selections are finalised.

To enable compliance with the Noise Protocol noise limits, all plant will need to be designed/located to achieve a cumulative level of **53 dB  $L_{eff}$**  at the nearest noise sensitive receivers when assessed over a 30-minute period. In our experience, the main mechanical plant associated with childcare centres such as this is generally limited to air-conditioning condenser units which can either be sited or appropriately mitigated to be compliant with the Noise Protocol noise limits. If mitigation is deemed to be required, it could be implemented in the form of localised acoustic screening and/or providing silencers or attenuators on plant items.

## 9.0 SUMMARY

It is proposed to develop a new 116-place childcare centre with parking for 25 cars at 438-440 Barkly Street, Footscray.

Noise criteria for the proposed childcare centre development have been developed considering the following:

- Environment Protection Regulations 2021
- EPA Publication 1826-5 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*
- *AAAC Guideline for Childcare Centre Acoustic Assessment (Version 3.0)*
- Recent relevant VCAT decisions
- *NSW Road Noise Policy*.

Clarity Acoustics has undertaken an assessment of environmental noise associated with the proposed development and found the following:

- Noise levels from children engaged in active play in the outdoor play areas associated with the childcare centre will be compliant with the nominated acoustic criteria based on the proposed design of the subject site and the incorporation of the proposed balustrades to the outdoor play areas
- Noise from the use of the carpark is predicted to comply with the relevant ERS objective and sleep disturbance criterion at all nearby properties based on the proposed design of the subject site and the incorporation of the proposed acoustic fencing as outlined in Section 5.0
- Traffic noise is predicted to comply with the traffic noise criteria based on conventional facade construction and the incorporation of the proposed balustrades to the outdoor play areas
- At this stage, the mechanical services plant selections have not been undertaken for the development. It is recommended that a detailed assessment of noise associated with the mechanical plant is undertaken once the plant selection is finalised. To enable compliance with the Noise Protocol noise limits, all plant will need to be designed/located to achieve a cumulative level of **53 dB L<sub>eff</sub>** at the nearest receivers when assessed over a 30-minute period.

## APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	The A-weighting filter covers the full audio range - 20 Hz to 20 kHz and the shape is similar to the response of the human ear at lower levels. A-weighted measurements correlate well with the perceived loudness at low sound levels, as originally intended.
dB	Decibel (dB) a relative unit of measurement widely used in acoustics, electronics and communications. The dB is a logarithmic unit used to describe a ratio between the measured sound level and a reference or threshold level of 0 dB.
Hz	Hertz (Hz) the unit of Frequency or Pitch of a sound. One hertz equals one cycle per second. 1 kHz = 1000 Hz, 2 kHz = 2000 Hz, etc.
$L_{A90}(t)$	The sound level exceeded for 90 % of the measurement period, A-weighted and averaged over time (t) and commonly referred to as the background sound level.
$L_{Aeq}(t)$	A-weighted equivalent continuous sound Level is the sound level equivalent to the total sound energy over a given period of time (t). Commonly referred to the average sound level.
$L_{Amax}$	The A-weighted maximum noise level. The highest sound level which occurs during the measurement period or a noise event.
$L_{eff}$	The level of noise emitted from the commercial, industrial or trade premises and adjusted, if appropriate, for character and duration.

**APPENDIX B PLANNING MAP**



**APPENDIX C SITE PLAN**

# 7.0 DEVELOPMENT SUMMARY

## 7.01 DEVELOPMENT SUMMARY

- 116 CHILDREN
- 3 LEVEL BUILDING
- ON GRADE CAR PARK - 25 SPACES REQUIRED

SITE ANALYSIS	QUANTITY
SUBJECT SITE AREA :	1303.00 sqm
PROPOSED BUILDING FOOTPRINT :	965.17 sqm
PROPOSED BUILDING SITE COVERAGE:	74.07 %
PROPOSED GFA LEVEL GROUND:	348 sqm
PROPOSED GFA LEVEL 1:	428 sqm
PROPOSED GFA LEVEL 2:	404 sqm
TOTAL PROPOSED GFA:	1180 sqm

PARKING	QUANTITY	REQUIRED	PROVIDED
CAR PARKING (INCL. DDA PARKING)	25 spaces / 116 children	0.22 per child (29)	0.216 per child (25)
DISABLED (DDA) PARKING	1 space	1 space	1 space
BICYCLE PARKING	4 spaces	0 space	4 space

DEVELOPMENT ANALYSIS	QUANTITY	REQUIRED (per child)	PROVIDED (per child)
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### LEVEL 1

ACTIVITY ROOM 01 (1-2 years) :	53.93 sqm / 16 children	3.25 sqm (52 sqm)	3.37 sqm
ACTIVITY ROOM 02 (1-2 years) :	41.10 sqm / 12 children	3.25 sqm (39 sqm)	3.43 sqm
ACTIVITY ROOM 03 (0-1 years) :	41.68 sqm / 12 children	3.25 sqm (39 sqm)	3.47 sqm
ACTIVITY ROOM 04 (1-2 years) :	53.03 sqm / 16 children	3.25 sqm (52 sqm)	3.31 sqm

LEVEL 1 EXTERNAL PLAY AREA :	503.68 sqm / 56 children	7.00 sqm	
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### LEVEL 2

ACTIVITY ROOM 05 (2-3 years) :	53.97 sqm / 16 children	3.25 sqm (52 sqm)	3.37 sqm
ACTIVITY ROOM 06 (3+ years) :	72.35 sqm / 22 children	3.25 sqm (71.5 sqm)	3.29 sqm
ACTIVITY ROOM 07 (3+ years) :	72.47 sqm / 22 children	3.25 sqm (71.5 sqm)	3.29 sqm

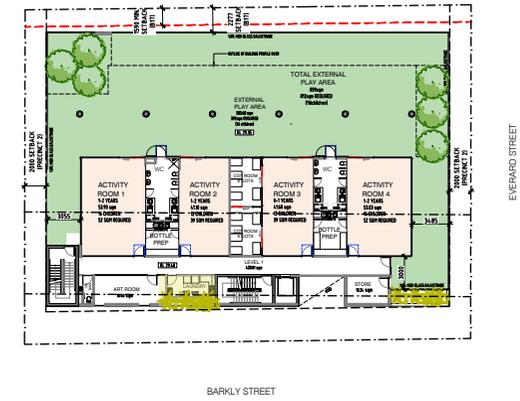
LEVEL 2 EXTERNAL PLAY AREA :	356.59 sqm / 60 children	7.00 sqm	
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### SUMMARY

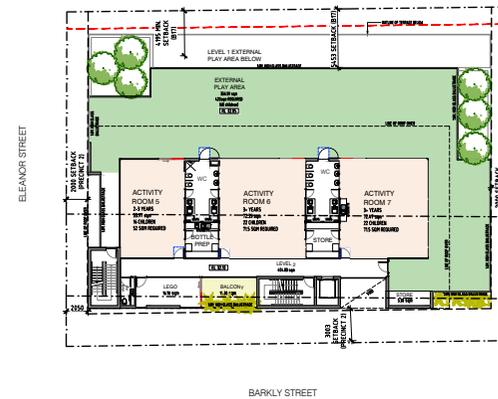
ACTIVITY ROOMS (6 rooms) :	388.53 sqm / 116 children	3.25 sqm (377 sqm)	3.49 sqm
TOTAL EXTERNAL PLAY AREA :	860.27 sqm / 116 children	7 sqm (812 sqm)	7.41 sqm



LEVEL GROUND



LEVEL 1



LEVEL 2

## APPENDIX D CHILDCARE GUIDELINES AND RELEVANT VCAT DECISIONS

### Design criteria

The AAAC guideline relating to childcare centres nominates the following design targets for assessing noise from children in outdoor play areas:

**Table 12 - Design criteria for outdoor play areas, dB**

Use of outdoor area	Design criteria
Up to 4 hours (total) per day	$L_{Aeq, 15 \text{ min}} \leq L_{A90, 15 \text{ min}} + 10 \text{ dB}$
More than 4 hours per day	$L_{Aeq, 15 \text{ min}} \leq L_{A90, 15 \text{ min}} + 5 \text{ dB}$

However, based on previous project experience, key planning precedents and discussions with other acoustic consultants, issues have been identified with the AAAC design criteria which are detailed in Table 3.

### Revised approach

A revised approach to the use of the AAAC design targets has been adopted by Clarity Acoustics (and other consultants). Accordingly, this assessment compares the noise from children playing at nearby receivers against a margin of 10 dB above the background noise levels. This approach is consistent with the VCAT decisions discussed in the next section.

### **Relevant VCAT decisions**

A review of relevant VCAT decisions has been undertaken to determine an approach to noise assessment of childcare centres and noise control design that is consistent with planning precedents in Victoria. The review concludes that noise from children playing in outdoor areas associated with childcare centres is considered to be consistent with residential amenity. It has also identified that there is a need to consider appropriate noise mitigation strategies for such developments.

Furthermore, the review also supports the view of Clarity Acoustics (and other acoustic consultants) that the design targets for noise from children in outdoor play areas nominated by the AAAC guideline are highly conservative. This is discussed below.

The following VCAT decisions are of relevance:

#### *Petzierides v Hobsons Bay CC (includes Summary) (Red Dot) [2012] VCAT 686 (28 May 2012)*

This Red Dot VCAT decision is of significance as it notes that there is a general agreement that noise from childcare centres is considered reasonable in residential areas. Notwithstanding this, it emphasises the need for appropriate noise controls to minimise noise impacts to an acceptable level. The Member states the following in her decision:

*Ms Hayes responded to this concern by pointing out there have been many decisions of the Tribunal and its predecessors that have viewed noise emanating from child care centres or, more specifically, from the children themselves as being reasonable within a residential area. Whilst I agree with this in general terms, it does not mean that a child care centre can obviate the need to act responsibly and appropriately by ensuring any noise impact is of an acceptable level, particularly given the size of child care centres today.*

Basic Element Pty Ltd v Hobsons Bay CC [2017] VCAT 522

This decision is of significance as it identifies the highly conservative approach nominated in the AAAC guideline for the assessment of noise from outdoor play areas.

With regards to the evidence given by the acoustic expert witness, it states the following:

*There is no accepted standard for noise from people. Mr Tardio referred to a guideline for child care centres prepared by the Association of Australian Acoustical Consultants (the AAAC guideline) that sets out recommendations for assessment methodology and acceptable noise levels. Other divisions of the Tribunal have determined that the AAAC Guideline should be given little weight in these matters as it is highly conservative and it has no statutory basis in any planning schemes. I see no reason to give this guideline any weight in this matter.*

PHHH Investments Pty Ltd v Bayside CC (Amended) [2015] VCAT 922

This decision is of significance as it identifies the use of the AAAC guideline as a guide to inform decision making and the design of noise control. It states:

*There is currently no policy or guidelines on noise. The AAAC guidelines would hence be useful in informing a decision making to determine whether noise emitted is excessive, and amelioration measures that can be used.*

The member in his/her decision agrees with the acoustic expert witness and makes the following comments:

*On this point, I agree with Mr. Marks and the NSW Land and Environment Court that noise from children playing outdoors are not equivalent to continuous industrial noise, the basis of the tougher guidelines.*

Following this the member accepts that the  $L_{A90} + 5$  dB criteria is not appropriate and states the following:

*In all, I adopt AAAC's approach to noise and the criterion of 10dB above background noise and adoption of permit conditions with regard to noise attenuation measures and management plan.*

Motherwell v Bayside CC [2016] VCAT 1918 (15 November 2016)

The role of the AAAC guideline as a guide for decision making is reiterated in this matter. It states the following in relation to the evidence given by the acoustic expert witness:

*There are no statutory noise regulations relating to the noise from children in a childcare centre. Mr Liu referred to guidelines prepared by the Association of Australian Acoustic Consultants (AAAC) which have been prepared to assist in the acoustic assessment of child-care centres. These guidelines have no statutory force, have not been adopted by government and are not referenced in the planning scheme. In Mr Liu's evidence they should be applied flexibly and do no more than provide a useful guide to noise criteria. In Mr Liu's evidence, a balance should be struck between applying the guidelines and ensuring that the acoustic treatments are appropriate in a residential setting.*

Xanthopoulos v Boroondara CC [2021] VCAT 834 (28 July 2021)

In this recent decision, the Member states the following in relation to the conservative nature of the AAAC guideline:

*I find the noise benchmarks established under the AAAC Guidelines somewhat conservative when noise from what is considered more incongruent to a residential area, such as industry can have similar noise criteria applied to it. There is a significant difference between the two forms of land use and the nature of noise that may be generated with the sounds of children playing compared to what can occur with industrial activity. In this sense, care needs to be exercised with the use of the AAAC Guidelines.*

*Beis Efraim College Limited v Bayside CC [2014] VCAT 856 (16 July 2014)*

This case relates to the change of use of a site that was previously used as a childcare centre to a pre-school. Objectors to the application noted that noise was not a negative impact at their properties when the site was used a childcare centre.

Furthermore, an assessment in strict accordance with the AAAC's more stringent design criterion ( $L_{A90} + 5$  dB) resulted in the need for barriers between up to 4 metres in height which was considered excessive. When the less stringent criterion of  $L_{A90} + 10$  dB was applied, the maximum barrier height required for compliance to be achieved was 2.7-3.0 metres high.

This decision supports the findings that noise from children in outdoor play areas is considered reasonable in residential areas and that the AAAC's design criterion of  $L_{A90} + 5$  dB is highly conservative.

## APPENDIX E VEHICLE AND PATRON ACTIVITY NOISE LEVELS

Noise levels associated with car movements and patron voices has been sourced from measurements conducted by Clarity Acoustics at similar sites. The sound power level data used in our assessment of early morning activity associated with the childcare centre car park is summarised in Table 13.

**Table 13 - Sound power level of vehicle and patron activity, dB L<sub>w</sub>**

Noise source	Octave band centre frequency							A
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	
Equivalent Average Noise Level, L <sub>eq</sub>								
'Normal' car	95	83	82	77	77	73	66	81
Maximum Noise Level Events, L <sub>max</sub>								
'Normal' car <sup>1</sup>	108	96	95	90	90	86	79	94
Car pass by	104	95	88	88	89	85	79	93
Patron	83	92	98	97	92	87	87	98

<sup>1</sup> Includes door closing and vehicle start up from stationary

## APPENDIX F NOISE PREDICTION METHODOLOGY

Predictions of operational noise from the subject site have been undertaken on the basis of:

- The sound emissions of noise sources associated with the subject site as outlined in Table 5
- A digital noise model of the site and surrounding environment
- International standard(s) used for the calculation of environmental noise propagation.

Details of the prediction methodology are summarised in Table 14 below.

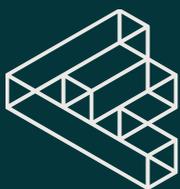
**Table 14 - Noise prediction methodology**

<b>Detail</b>	<b>Description</b>
Software	Proprietary noise modelling software SoundPLAN v9.1
Method	International Standard ISO 9613-2:2024 <i>Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation</i> (ISO 9613-2).
Ground conditions	Ground factor of $G = 0.5$ i.e., 50% hard ground
Atmospheric conditions	Temperature 10°C and relative humidity 70%  This represents conditions which result in relatively low levels of atmospheric sound absorption.
Receiver heights	1.5 m AGL for ground floor and 1.5 m above FFL for subsequent floors

# Sustainability Management Plan

438-440 Barkley Street,  
Footscray VIC

14/11/2025



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a part of

Sustainability

Tech Partners Pty Ltd



# Sustainability Management Plan (SMP)

## Proposed Childcare Facility Development

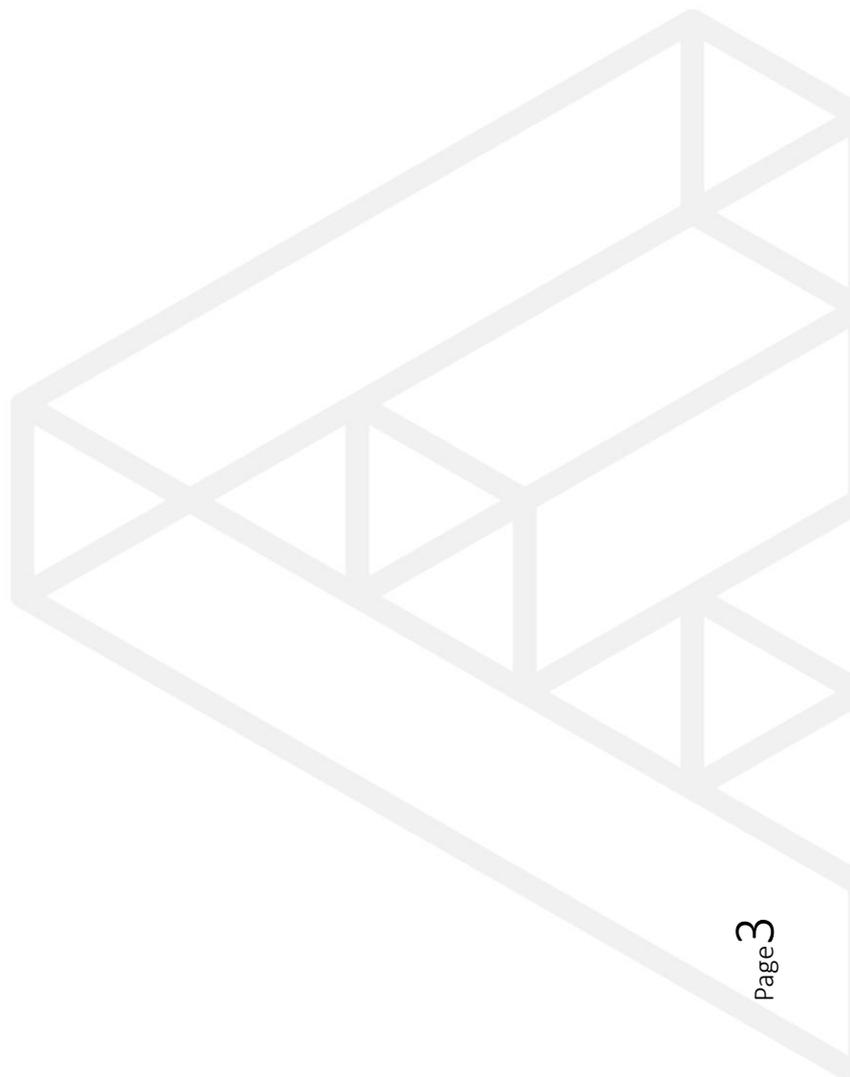
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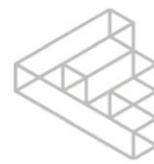
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## **DOCUMENT VERSION**

<b>Version</b>	<b>Date</b>	<b>Changelog</b>	<b>Author</b>	<b>Review</b>
0	15/10/25	Issued for Client Review (FCS 66494)	HH	DG
1	14/11/25	Amended per new drawings (FCS 67594)	HH	-





## INITIATIVES TO BE MARKED ON DRAWINGS

### **Water & Stormwater Management**

- Mark-up showing roof catchment area to be diverted to the Rainwater tank – If required, the use of charged pipe system will be explicitly acknowledged on the drawings and charged pipes will not be running underneath the building footprint.
- Location and size of each Rainwater tank proposed
- Note showing connection to the toilets
- Note showing use of native or drought tolerant species for landscaped area. Watering will not be required after an initial period when plants are getting established. If irrigation is required, it will be connected to rainwater tanks.
- Note showing WELS rating for water fittings/fixtures (refer to report) – Fixtures (e.g. dishwasher) provided as part of base building work have to be chosen within one WELS star of best available at the time of purchase.

### **Energy Efficiency**

- Note showing commitment to exceeding section J energy efficiency requirement of NCC 2022
- Note showing the maximum illumination power density ( $W/m^2$ ) of the development meet the requirements in NCC 2022
- Lighting sensors for external lighting (motion detectors, timers etc.)
- Fossil-fuel free development

### **Indoor Environment Quality**

- Note showing commitment to Outside Air Fan in regularly occupied spaces providing O/A rates 50% above minimum from AS1668 **OR** mechanical systems to ensure CO<sub>2</sub> concentration remains below 800ppm
- Note showing operable windows on all regularly occupied rooms nominated for natural ventilation (floor plans and elevations)
- Glazing to improve daylight performance by maximising VLT to achieve minimum VLT of 40%

### **Transport**

- Bike space location for employees (2 minimum)
- Bike space location for visitors (1 minimum)

### **Urban Ecology**

- Show extent of vegetated areas around the site (includes lawn)

## INTRODUCTION

Frater Consulting Services have been engaged to undertake a Sustainability Management Plan for the proposed childcare development located at 438-440 Barkley Street, Footscray VIC. This has been prepared to address the Maribyrnong City Council's sustainability requirements especially Clause 15.01-2L-03 *Environmentally Sustainable Development*.

Within Clause 15.01-2L-03, Maribyrnong City Council has identified the following key categories to be addressed

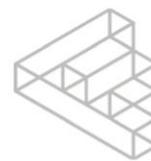
- Energy Performance;
- Water Resources;
- Stormwater Management;
- Indoor Environment Quality;
- Building Materials;
- Construction, Building & Waste Management;
- Transport; and
- Urban Ecology / Innovation.

The site has been assessed using the BESS tool. BESS was developed by association of councils led by Merri-bek City Council. This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate how new development can meet sustainability requirements as part of a planning permit application for the participating council.

Each target area within the BESS tool generally receives a score of between 1% and 100%. A minimum score of 50% is required for the energy, water, stormwater and IEQ areas. An overall score of 50% represents 'Best Practice' while a score over 70% represent 'Excellence'. The result of the BESS assessment is included as Appendix E.

The Stormwater Treatment Objective – Relative Measure (Blue Factor) calculator, which addresses stormwater quality considerations, has been used for the development to ensure that stormwater management best practice requirements have been achieved. The result of the Blue Factor assessment is included as Appendix A.





## SITE DESCRIPTION

The proposed site is located at 438-440 Barkley Street, Footscray VIC. The 1,306m<sup>2</sup> site is currently vacant. It is located approximately 7kms west of the Melbourne CBD.

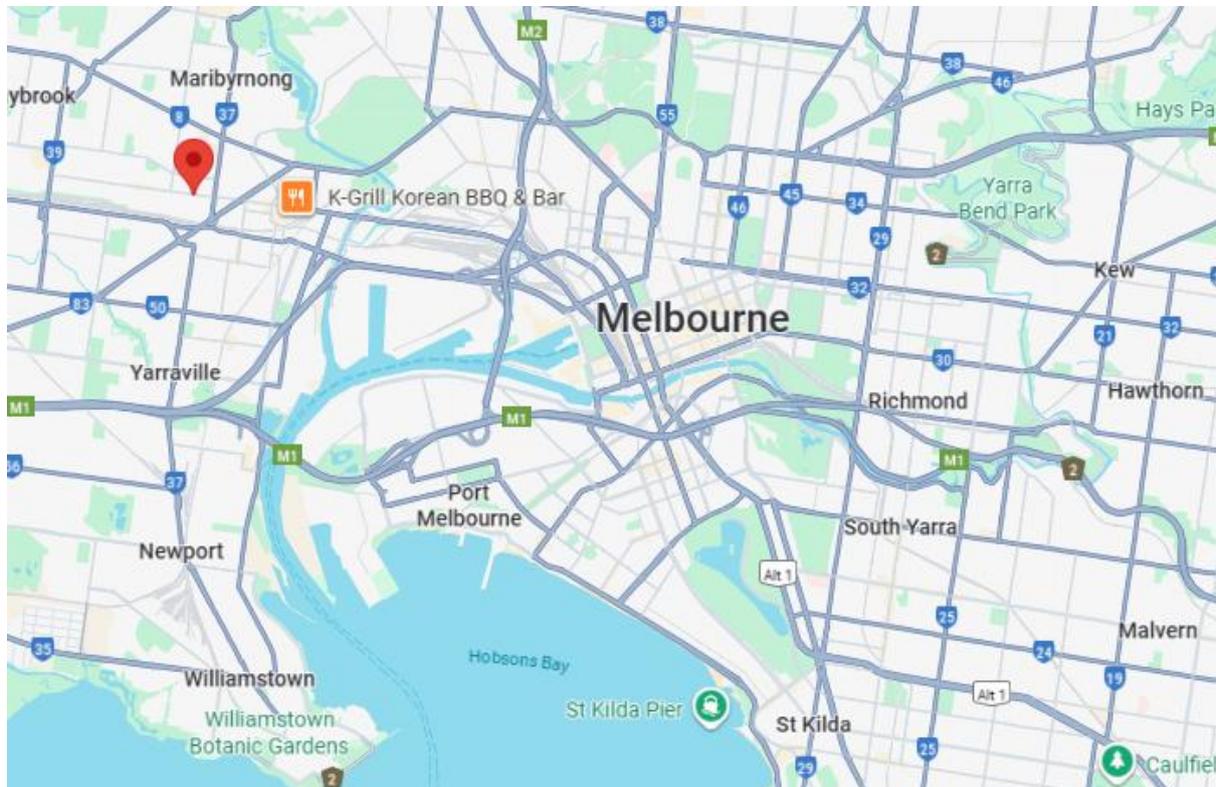


Figure 1: Location of the proposed childcare in Footscray with relation to Melbourne CBD (Source: Google Maps)

## PROPOSED DEVELOPMENT

The proposal consists of development of the site into a three-storey childcare facility to accommodate up to 116 children. The area of the site is approximately 1,306m<sup>2</sup>. The facility will include seven children's rooms, a laundry, staff room, kitchen, offices as well as large outdoor play area on first and second floors.

## ENERGY EFFICIENCY

Energy and its key elements should be integrated into the design of the proposed development. These elements contribute to reducing greenhouse gas emissions by utilising energy efficient appliances, energy conservation measures and renewable energy.

### Energy Efficiency

Prior to the building construction stage of the project, a section J (NCC 2022) DTS assessment will occur with the following commitments:

- 10% improvement on floor and ceiling insulation level requirement from NCC 2022;
- Wall and glazing performance to be in line with DTS requirements;
- Heating/cooling system to be chosen within one star of the best available product in the range at the time of purchase or COP/EER 85% or better than most efficient equivalent capacity unit available if no star rating is available; and
- Water heating system to be chosen within one star of the best available product in the range at the time of purchase or 85% or better than most efficient equivalent capacity unit available if no star rating is available.

Alternatively, prior to the building construction stage of the project, energy modelling will occur with the aim of exceeding requirement of NCC 2022, using an NCC J1V3 modelling process. This will be achieved through the use of high-performance building fabric and glazing, low energy lighting and building services. **The reference building model will include the minimum improvement committed above for floor and ceiling.** This method will allow for flexibility in for glazing performance. Results in BESS using J1V3 approach would yield a slightly lower score under BESS Energy 1.1 however our BESS assessment has been prepared to ensure that energy section and overall compliance is maintained.

### Heating and Cooling Systems

To reduce the energy consumption heating and cooling will be provided by energy efficient air conditioners (chosen within one star of the best available product in the range at the time of purchase or COP/EER 85% or better than most efficient equivalent capacity unit available if no star rating is available).

### Hot Water Heating

Hot water for the development will be provided with an efficient electric heat pump system.

### Fossil Fuel-Free Development

No gas connection will be provided for the development. This will reduce reliance on fossil fuel and will be in line with local and state targets of decarbonisation.

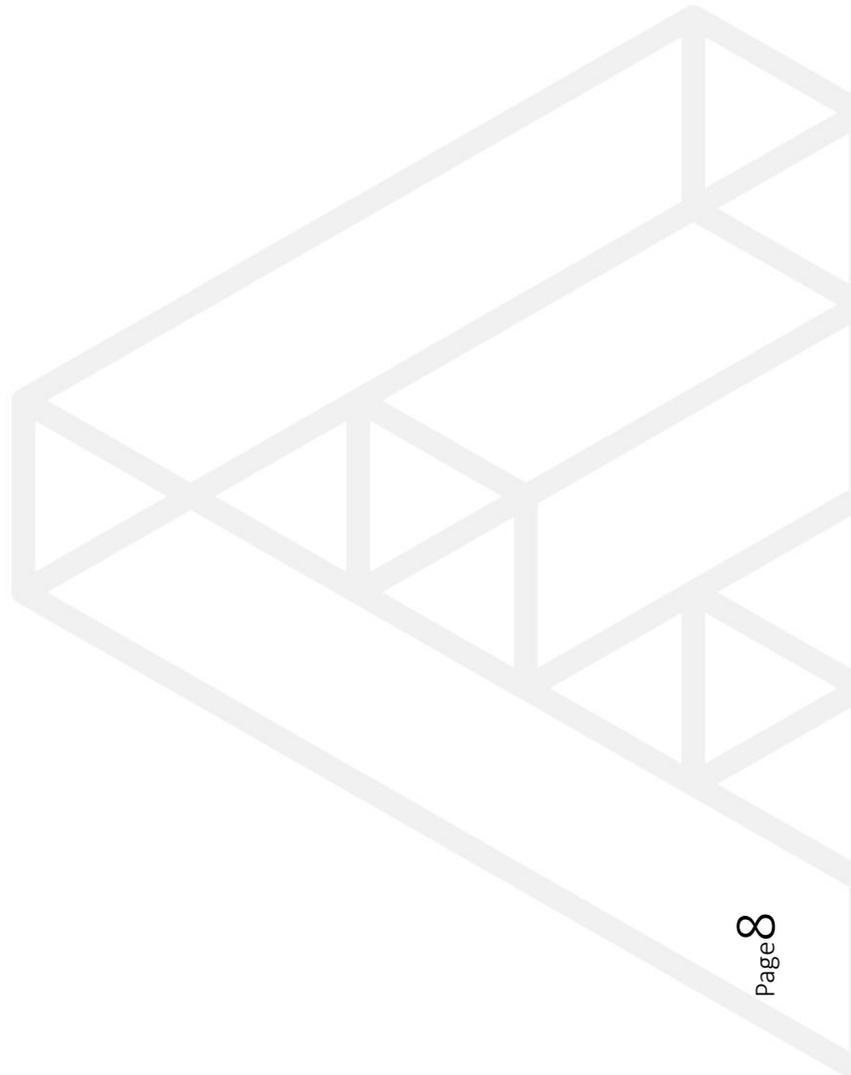


## **Lighting**

The maximum illumination power density ( $W/m^2$ ) of the development will meet NCC 2022 requirements in by the use of LED throughout the development.

## **Lighting Sensors**

Common areas and transient spaces will be controlled using occupancy sensor and/or daylight sensors. Ventilation in these areas will be controlled using timers and other sensors.



## WATER EFFICIENCY & STORMWATER MANAGEMENT

Water saving-use and reuse and its key elements should be integrated into the design of the proposed development. These principles contribute to reducing the water demand in addition to promoting water reuse. Stormwater management and its key elements should be integrated into the design of the proposed development. These principles contribute to ensuring natural systems are protected and enhanced whilst promoting on-site retention and aims to reduce runoff or peak flows.

### Water Efficient Fittings

The development will include efficient fittings and fixtures to reduce the volume of mains water used in the development. The following WELS star ratings will be specified;

- Toilets – 4 Star;
- Taps (bathroom and kitchen) – 6 Star;
- Showerhead if provided – 4 Star with aeration device (6.0-7.5L/min);
- Washing Machine – 3 Star; and
- Dishwasher – 5 Star.

### Rainwater Collection & Use

Rainwater runoff from the entire roof areas will be collected and stored in rainwater tanks<sup>1</sup> with a minimum total effective capacity of 15,000L for the development.

If required, a charged pipe system or multiple tanks will be installed to collect water from the entire roof of the development.

**In the case of a charged pipe system, the charged pipes will not be running underneath the building footprint (slab) and the stakeholders (builder/developer/architect) will be required to explicitly acknowledge this solution and have the capacity to install it.**

Rainwater collected will be used for toilet flushing throughout the development. These initiatives will reduce significantly the stormwater impacts of the development and help achieve compliance with the Blue Factor calculator (See Appendix A).

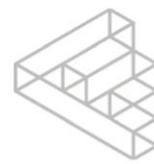
### Water Efficient Appliances

All appliances provided in the development as part of the base building work (e.g. dishwasher) will be chosen within one WELS star of the best available.

### Water Efficient Landscaping

Native or drought-tolerant plants will be implemented for the landscaped areas on site. Use of water or irrigation will not be required after an initial period when plants are getting established. If irrigation is required, it will be connected to rainwater tanks.

<sup>1</sup> Please note that any stormwater detention volume requirement for the site will be in addition to the proposed rainwater retention and that the proposed tank will not be directly topped up by mains water.



## INDOOR ENVIRONMENT QUALITY

Indoor Environment Quality and its key elements should be integrated into the design of the proposed development. These elements play a significant role in the health, wellbeing and satisfaction of the development occupants. Facilitating a good (IEQ) design provides a naturally comfortable indoor environment and less dependence on building services such as, artificial lighting, mechanical ventilation and heating and cooling device.

### **Volatile Organic Compounds**

All paints, adhesives and sealants and flooring will have low VOC content. Alternatively, products will be selected with no VOCs. Paints such as eColour, or equivalent should be considered. Please refer to Appendix D for VOC limits.

### **Formaldehyde Minimisation**

All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively, products will be specified with no Formaldehyde. Products such as ecological panel – 100% post-consumer recycled wood (or similar) will be considered for use within the development. Please refer to Appendix D for formaldehyde limits.

### **Daylight Levels**

Daylight penetration will be enhanced with the use of light internal colours to improve daylight reflection. All children room's will be provided with large windows. The depth of most room from a window will be limited and multiple windows on different façade will be implemented wherever possible which will allow for large amount of daylight to penetrate the rooms.

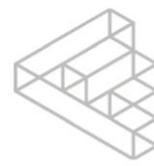
Internal windows will also be provided between rooms and between the room and the internal corridor within the development improving further the daylight spreading within the development.

Please refer to appendix C for daylight Hand Calculation showing compliance with best practice requirements.

### **Mechanical Ventilation – Improved Outside Air Rates**

All regularly occupied spaces with O/A fans will commit to provide 50% increase on O/A provision from AS1668.

Alternatively, where mechanical systems will be provided in the regularly occupied spaces, a commitment to ensure that CO2 concentration in the rooms remain below 800ppm.



## **Natural Ventilation**

Wherever possible, the design should also allow for cross flow ventilation as it will reduce the need for mechanical ventilation. Openable windows will be specified throughout the children rooms to enable natural ventilation.

Ventilation openings in all regularly rooms will be sized to ensure that the opening is 2% of the floor area or  $> 1\text{m}^2$  (whichever is greater). Breeze paths must be 15m or less, with No more than 1 doorway or opening  $< 2\text{m}^2$  between the ventilation openings.

Single-sided ventilation can be applied to office spaces or other regularly occupied areas where only one façade is available for ventilation openings. Compliance can be achieved in one of two ways: first, by limiting the maximum permissible room depth to 5m and providing openings that are either separated high and low or split across the width of the room or façade, with each opening equal to 5% of the floor area; or second, by ensuring that the total area of openings is at least 30% of the floor area.

Activity rooms 1,4,5,7 and Lego room will have access to crossflow ventilation. Spaces such as the art room, staff room, planning room and office will be designed to have effective single sided ventilation. 60% has been claimed in BESS to meet the minimum compliance requirements for this initiative.

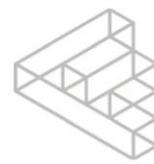
## **Thermal Comfort - Shading**

All north facing glazing are provided with horizontal projection which will provide appropriate shading, improving thermal comfort and reducing solar heat gain in summer.

All east and west-facing glazing in children's rooms are provided with horizontal projection above. This is typically not the most appropriate type of shading for east and west façades however it is not possible install external adjustable shading or vertical shading for children's rooms as this would be a hazard for children moving in and out of the room. For this reason, these improved horizontal projections are deemed appropriate for east and west facing glazing on children rooms.

**Horizontal shading depth should be 25% of the height from the window sill to the bottom of the shading.**

Based on all shading types proposed on each façade in the development, we have input 95% under IEQ 3.4 in BESS.



## CONSTRUCTION, BUILDING & WASTE MANAGEMENT

Building Management and its key elements will be integrated into the design of the proposed development. These principles contribute to ensuring efficient and effective on-going building performance. Waste management and its key elements will be integrated into the design of the proposed development. These principles contribute to ensuring minimal waste is transported to landfill by means of disposal, recycling and on-site waste storage and/or collection methods.

### **Metering and Monitoring**

The development will be separately metered for potable water and energy. Effective metering ensures that tenants are responsible for their consumption and they can reduce their consumption.

### **Construction Waste Management**

A waste management plan will be introduced to all on-site staff at a site orientation session to ensure that the waste generated on site is minimised and disposed of correctly. A minimum 80% of all construction waste generated on site will be reused or recycled.

### **Construction Environmental Management**

The builder will identify environmental risks related to construction and include management strategies such as maintaining effective erosion and sediment control measures during construction and operation and ensure that appropriate staging of earthworks (e.g. avoid bare earthworks in high risk areas of the site during dominant rainfall period).

### **Operational Waste**

A dedicated storage area will be provided on site. The storage area will be sufficiently sized to accommodate the general and recycling waste. Recycling facilities will be as conveniently accessible as the general waste facilities.

### **Universal Access**

The development will be designed for universal access in accordance with AS1428.2 to allow persons with limited mobility to enter and use the premises.

## TRANSPORT

### **Bicycle Parking**

Employees will be able to store their bicycle within the development. A minimum of two spaces will be provided.

An additional visitor bike space will be provided outdoor in the development's car park.

## BUILDING MATERIALS

Materials selection should be integrated into the design of the proposed development. The criteria for appropriate materials used are based on economic and environmental cost.

### Timber

All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified, or recycled / reused.

### Flooring

Wherever possible, flooring will be selected from products/materials certified under any of the following:

- Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2;
- Global GreenTag - <https://www.globalgreentag.com/>; and/or
- Good Environmental Choice (GECA).

### Joinery

Where possible, joinery will be manufactured from materials/products certified under any of the following:

- Global GreenTag - <https://www.globalgreentag.com/>; and/or
- Good Environmental Choice (GECA); and/or

### Steel

Wherever possible, steel for the development will be sourced from a Responsible Steel Maker<sup>2</sup>. Reinforcing steel for the project will be manufactured using energy reducing processes commonly used by large manufacturers such as Bluescope or OneSteel.



<sup>2</sup> A Responsible Steel Maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place, and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).

## URBAN ECOLOGY

In highly urbanised environments, such as metropolitan Melbourne, it is important to recognise the importance of maintaining and increasing the health of our urban ecosystems to improve living conditions not only for the fauna but also ourselves. We can improve our urban ecosystem through the incorporation of vegetation through landscaping for both new and existing developments.

### **Landscaping**

The landscaping onsite will provide the occupants with a pleasant surrounding environment. The design will incorporate a mix of native species to help maintain local biodiversity.

### **Insulant ODP**

All thermal insulation used in the development will not contain any ozone-depleting substances and will not use any in its manufacturing.

## IMPLEMENTATION & MONITORING

The proposed development will meet the best practice requirement of the City of Maribyrnong through the different initiatives describe in this report such as thermally efficient building envelope, efficient air conditioning and hot water system and sustainable materials. An appropriate implementation and monitoring of the initiatives outlined within this report will be required.

Implementation of the ESD initiatives outlined in this report requires the following processes:

- Full integration with architectural plans and specifications
- Full integration with building services design drawings and specifications
- Endorsement of the ESD Report with town planning drawings
- ESD initiatives to be included in plans and specifications for building approval

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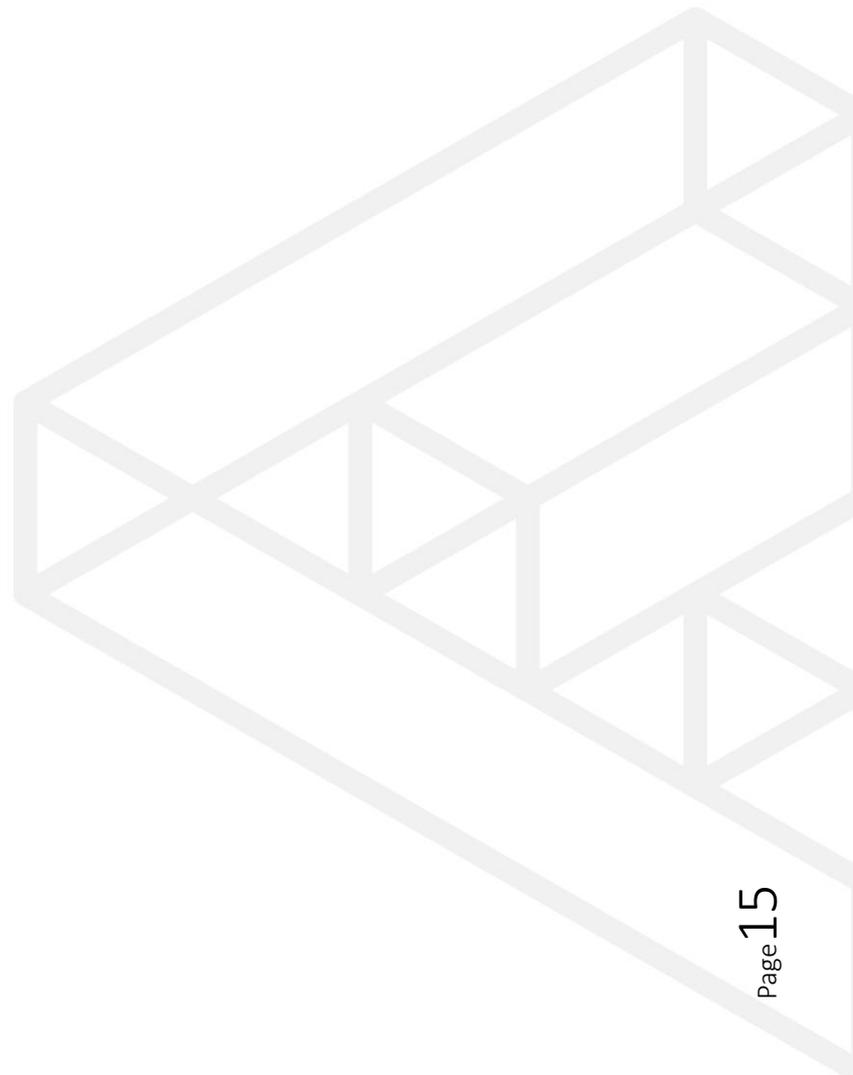


## APPENDIX A – WSUD REPORT / BLUE FACTOR ASSESSMENT

New development must comply with the best practice performance targets for suspended solids, total phosphorous and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

- Suspended Solids - 80% retention of typical urban annual load.
- Total Nitrogen - 45% retention of typical urban annual load.
- Total Phosphorus - 45% retention of typical urban annual load.
- Litter - 70% reduction of typical urban annual load.

The Blue Factor tool, an industry accepted tool, was used to assess the development and ensure that the best practice targets described above are met. A minimum compliance score of 100% is required to achieve for the development.





## Site Delineation

For the purpose of the assessment, the development has been delineated into the following surface types:

- Site area of 1,306m<sup>2</sup>.
- Roof area runoff of 561m<sup>2</sup> which will be diverted into rainwater tank(s);
- Permeable areas of 229m<sup>2</sup> comprised of landscaped area and other pervious areas on site; and
- Remainder of impervious areas of 516m<sup>2</sup> comprised of the play areas and other impervious areas around the site.

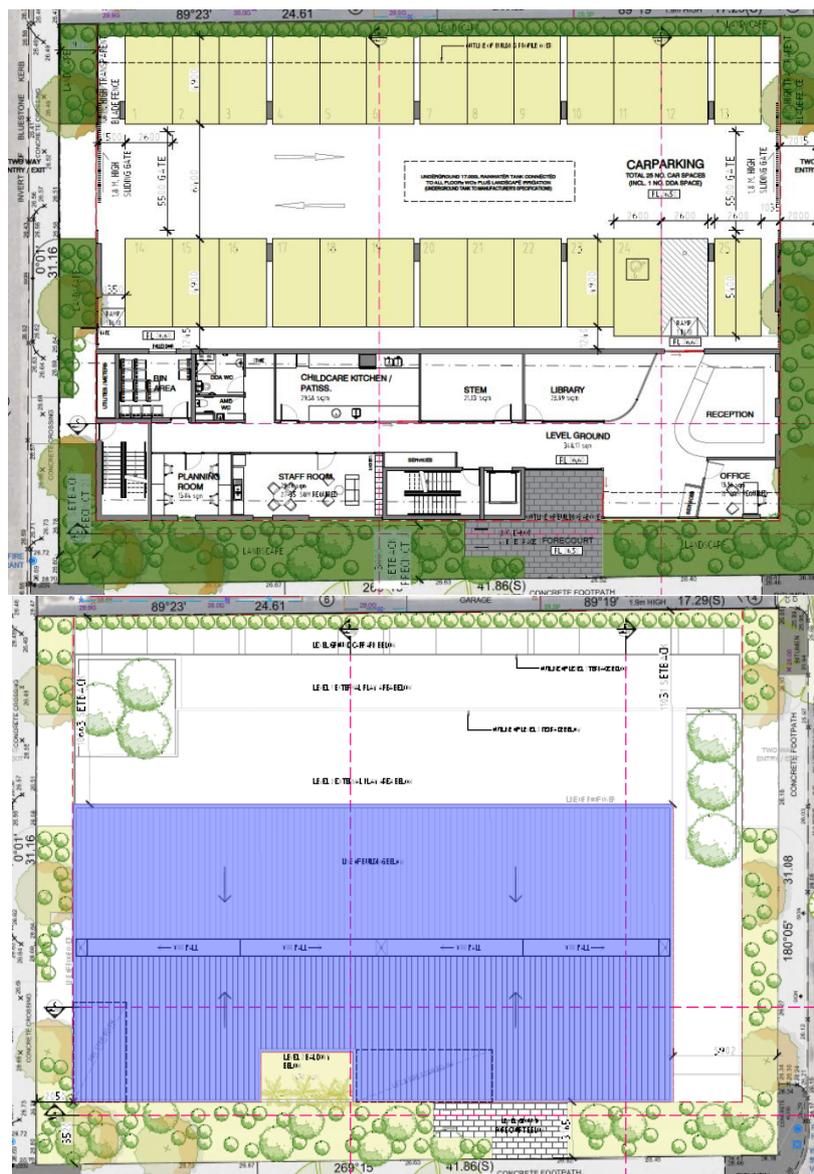
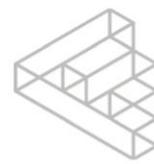


Figure 2: Roof catchment to RWT(blue) and permeable areas (green)



## **Stormwater initiatives**

### **Rainwater Tank**

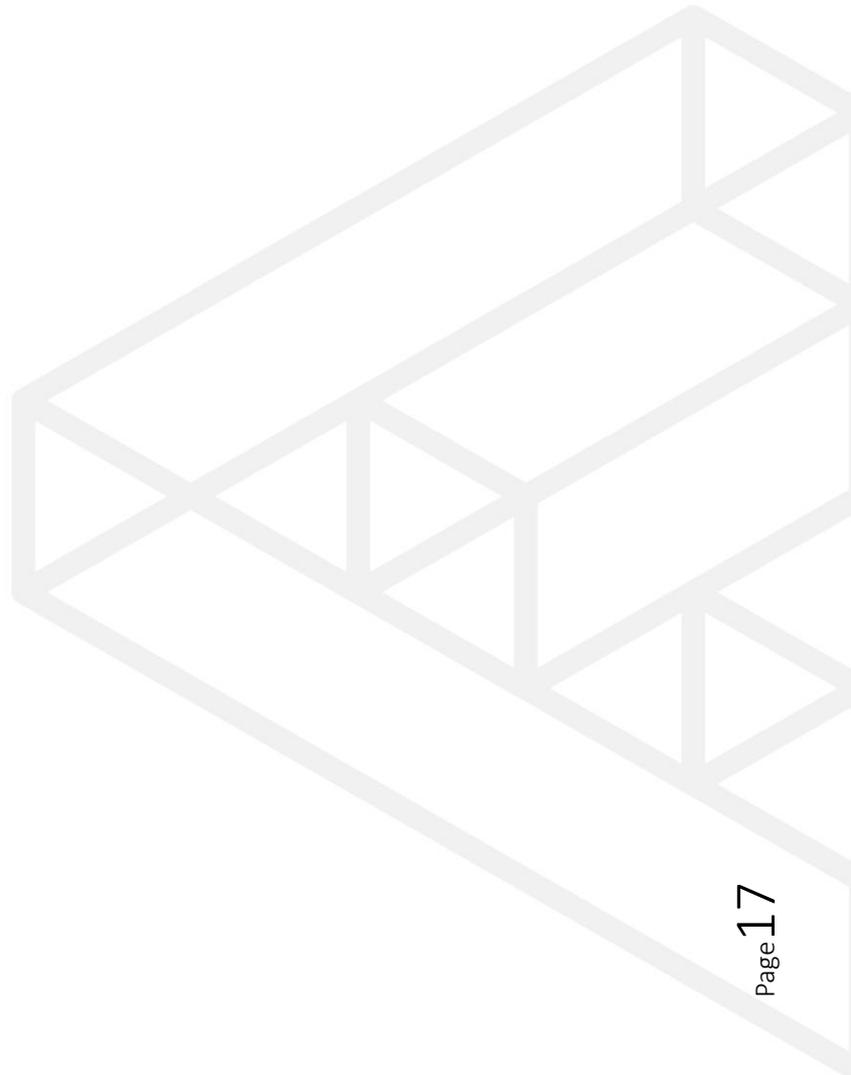
#### ***(Rainwater tank for toilet flushing)***

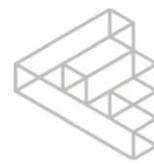
The roof catchment area of 561m<sup>2</sup> (as described above) will be diverted to rainwater tank(s) with a total effective capacity of at least 15,000L for the development. The rainwater collected will be used for toilet flushing in the development.

If required, a charged pipe system or multiple tanks will be installed to collect water from the entire roof of the development.

**In the case of a charged pipe system, the charged pipes will not be running underneath the slab and the stakeholders (builder/developer/architect) will be required to explicitly acknowledge this solution and have the capacity to install it.**

**It should be noted that permeable areas have been maximised in the development which will reduce the overall stormwater outflows from the site. Vegetated areas are provided in the proposed development reducing the heat island effect and improving the local habitat.**

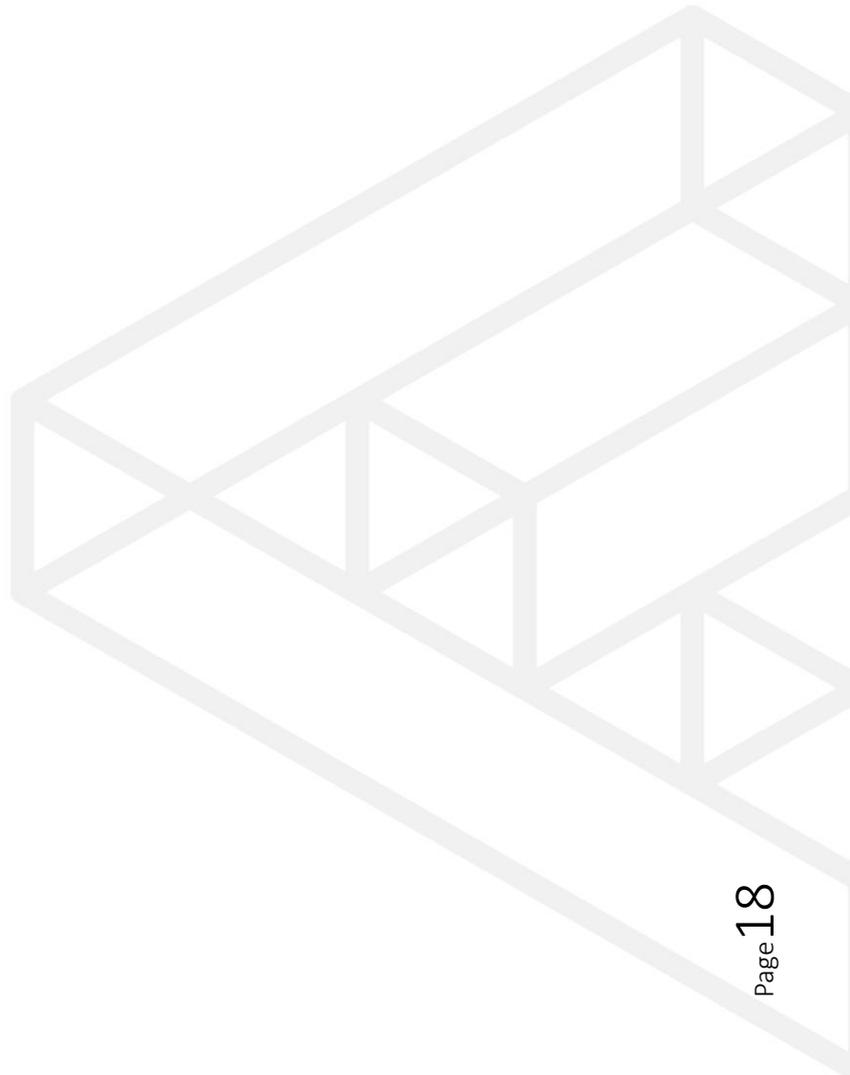




## **Stormwater Results**

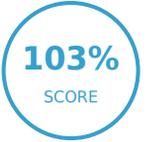
The initiatives and areas described above have been applied to the Blue Factor calculator and the proposed development has achieved a score of more than 100%

**It should be noted that the entire development is connected to the rainwater tank. 116 occupants have been chosen for the combined childcare occupancy due to the number of children noted on the plans.**



## 438-440 Barkly St, Footscray VIC 3011, Australia V1

The proposed stormwater treatments provide 'deemed to comply' compliance with the minimum planning requirement for total nitrogen but does not comply with all the relevant objectives for management of stormwater flows on-site.



### Project details

Name	438-440 Barkly St, Footscray VIC 3011, Australia V1
Street address	438-440 Barkly St, Footscray VIC 3011, Australia
Municipality	Maribyrnong
Site area	1306 m <sup>2</sup>
Planning Number	

### Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	46%	>28%
Mean annual runoff volume infiltrated or filtered (%)	0%	>9%
Total suspended solids (%)	47%	>80%
Total phosphorus (%)	47%	>45%
Total nitrogen (%)	46%	>45%
Total gross pollutants (%)	52%	>70%

### Water treatment

#### Catchments

**Roof to RWT** 561m<sup>2</sup>

**Permeable Areas** Pervious (garden and lawn), 229m<sup>2</sup>

**Other Untreated Impervious Areas** Paved, 516m2

## Treatments

### **Rainwater Tank 1**

Rainwater tank retention volume in kilolitres: 15

## Buildings & dwellings

### **Childcare Building**

Non-Residential BCA Class 5 - Commercial/Office,  
116 employee(s)

### **Configuration 1**

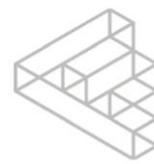
**Roof to RWT** 561m2

### **Rainwater Tank 1**

Rainwater tank retention volume in kilolitres: 15,

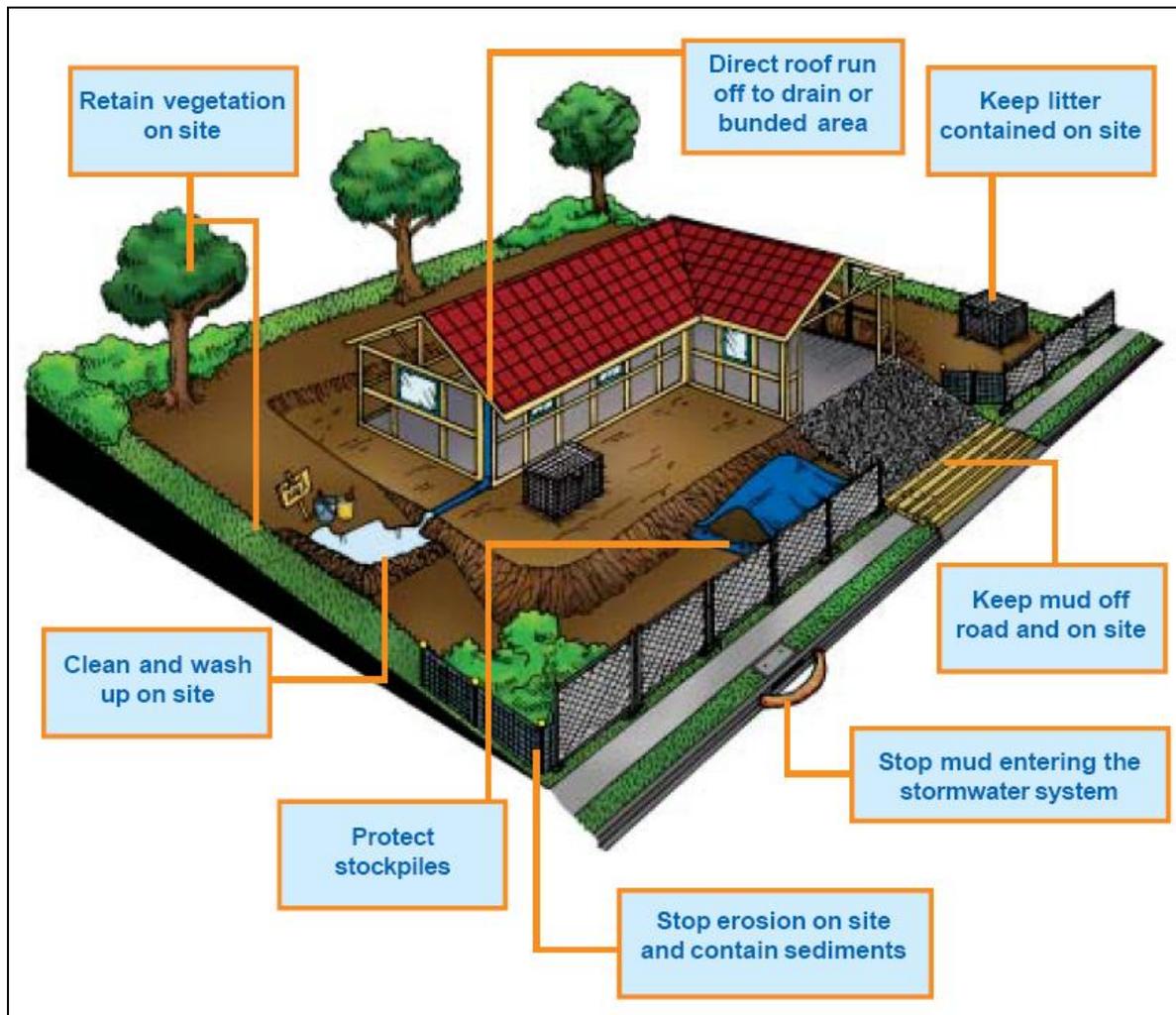
### **Childcare Building**

Non-Residential BCA Class 5 - Commercial/Office,  
116 employee(s)



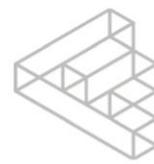
## **Stormwater Management at Construction Site**

To manage stormwater management in the construction stage, measures will be put in place to minimise the likelihood of contaminating stormwater. This will mean ensuring buffer strips are in place, sediment traps are installed, and the site will be kept clean from any loose rubbish. The builder will follow the process outlined in “Keeping Our Stormwater Clean – A Builder’s Guide” by Melbourne Water.



Copies of “Keeping Our Stormwater Clean – A Builder’s Guide” booklet can be downloaded from the following website.

<https://www.clearwatervic.com.au/resource-library/guidelines-and-strategy/keeping-our-stormwater-clean-a-builders-guide.php>



## APPENDIX B – WSUD MAINTENANCE & INSTALLATION

### **Installation**

#### **Rainwater Tank(s)**

The rainwater tank(s) will be installed underground. Its manufacturer or material has not been nominated. It will be installed with a mesh insect cover over the inlet pipe to ensure the tank does not become a breeding ground for pests. Mesh needs to be installed over overflow pipes and if a manhole is present it needs to be properly sealed.

Please refer to the architectural drawings for the location of the rainwater tank.

#### **Pumps**

The pumps required either to divert the stormwater runoff to the rainwater tank or to distribute the collected water to the end uses (toilets) will be required to be installed as per the chosen manufacturer specifications.

### **Inspection Requirements**

#### **Rainwater Tanks**

Inspections of roof areas and gutters leading to the tank should take place every 6 months. Rainwater in the tanks should be checked every 6 months for mosquito infestation.

The rainwater tank should be examined every 2 years for sludge build up.

Ensure the monitoring system (be it digital or a simple float system) is functioning properly by checking the water level in the rainwater tanks.

#### **Pumps**

The pumps required will be required to be routinely inspected by listening for the day-to-day operation of the pumps. Unusual noise or no noise should be investigated. Inspection should occur as per the chosen manufacturer specifications.

### **Clean Out / Maintenance Procedure**

#### **Rainwater Tank, Roof and Gutters**

Rainwater tanks will require the roof and gutters onsite to be maintained; gutters should be checked, maintained and cleaned every six months to avoid blockages from occurring. If a leaf blocking system is installed this can be completed annually.

Any trees onsite should be maintained every 6 months with branches overhanging the roof removed.

Water ponding in gutters should be avoided as this provides a breeding ground for mosquitos; tanks should also not become breeding grounds for mosquitoes. If mosquitoes are detected in the tank remedial steps need to occur to prevent breeding. If mosquitoes or other insects are found in rainwater tanks, the point of entry should be

located and repaired. As well as preventing further access, this will prevent the escape of emerging adults. Gutters should be inspected to ensure they do not contain ponded water, and be cleaned if necessary.

Please refer to <https://www.health.vic.gov.au/sites/default/files/2022-11/Keeping-your-rainwater-tank-safe-from-mosquitos.pdf> for more information on mosquito control.

Rainwater tanks should be checked by regular maintenance person every 3-6 months to ensure that connection to the building is maintained and there are no blockages.

A simple way to ensure the tank is operating as intended would be through the installation of a smart monitoring device (e.g. OneBox®). These systems allow users to operate tanks remotely from internet or smartphone, monitor and control the tanks in real time, allow automatic release of stored water prior to storm events, alert users if there is any blockage and view tank history and usage patterns.

Alternatively, onsite tank gauges can help those familiar with the tank know if the tank is not working correctly.

### Pumps

Maintenance should occur as per the chosen manufacturer specifications. All strainers and filters should be cleaned every 6 months. Good quality pump should provide trouble free service for up to 10 years.

## **Commissioning**

### Rainwater Tank

All rainwater tanks should be washed or flushed out prior to use. All inlets and outlets should be correctly sealed to prevent insects entering. Connection to all toilets in the development should be tested (dye test or equivalent).

Please note if new roof coating or paint is to be installed then the first few run-offs after installation need to be discarded.

### Pumps

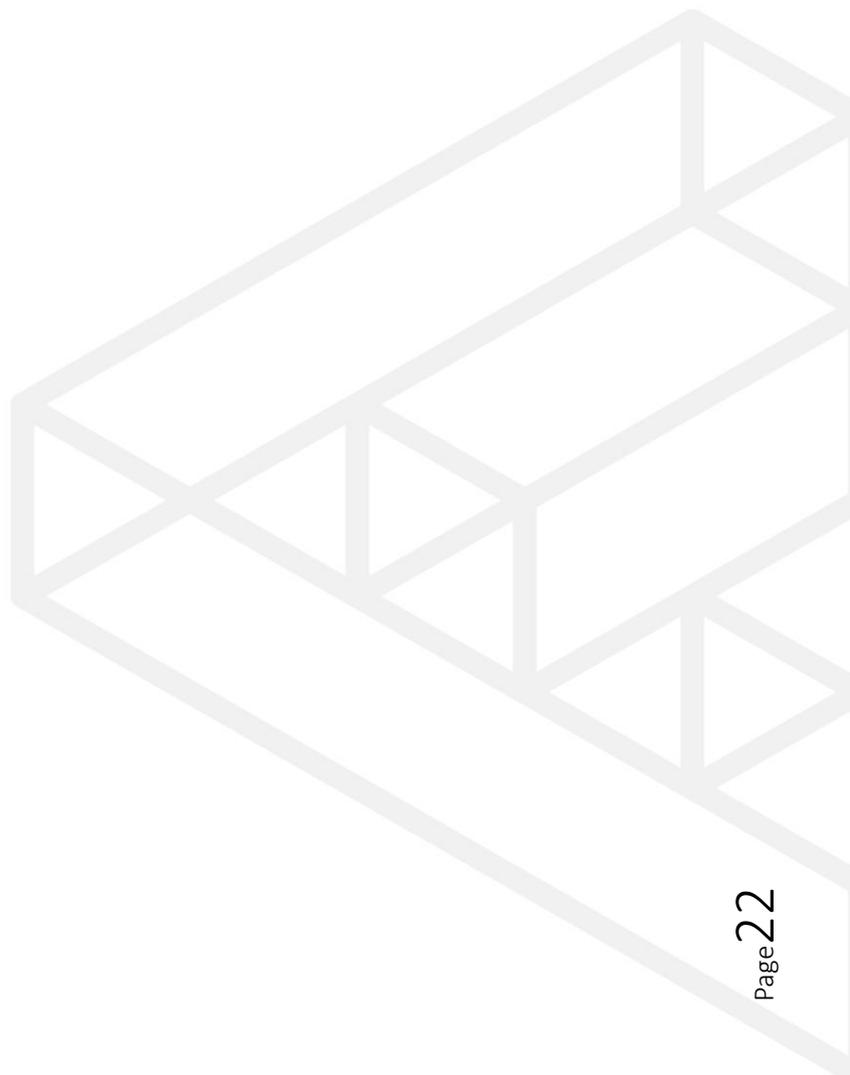
Commissioning should occur as per the chosen manufacturer specifications.

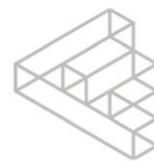


## Summary

The following needs to occur onsite to ensure compliance with WSUD requirements and maintain operation of rainwater tank and connections onsite.

Task	When?	Requirement
Inspect Rainwater tanks	Every 6 months	<ul style="list-style-type: none"><li>• Check for any damage/compression</li><li>• Mosquitoes infestation</li></ul>
	Every 2 years	<ul style="list-style-type: none"><li>• Sludge Build up – if sludge build up occurs a vacuum tank needs to be called out to site.</li></ul>
Inspect roofs & gutters	Every 6 months	<ul style="list-style-type: none"><li>• Clean out of leaves / debris.</li><li>• Remove any overhanging branches onsite.</li></ul>





## APPENDIX C – DAYLIGHT ACCESS – GREEN STAR CALCULATION

The Green Building Council of Australia (GBCA) has created a daylight access calculation method within the Green Star benchmarking tool. This tool is widely recognised by Councils and Industry.

The Green Star Daylight Hand Calculation method is used to determine if there are risks associated with the current design, particularly with respect to meeting the desired daylight factors referenced in the Sustainable Management Plan in the Planning Process (SDAPP) Indoor Environment Quality guidelines.

**According to the SDAPP guidelines, best practice is achieved where 2% daylight factor is achieved across 30% of the floor area of the nominated area.**

The calculation method is based on one simple formula to calculate a zone of compliance within a nominated room. The compliant zone is the area of the room achieving 2% daylight factor and can be calculated as follows:

$$\text{Zone of Compliance} = 2 \times h \times w$$

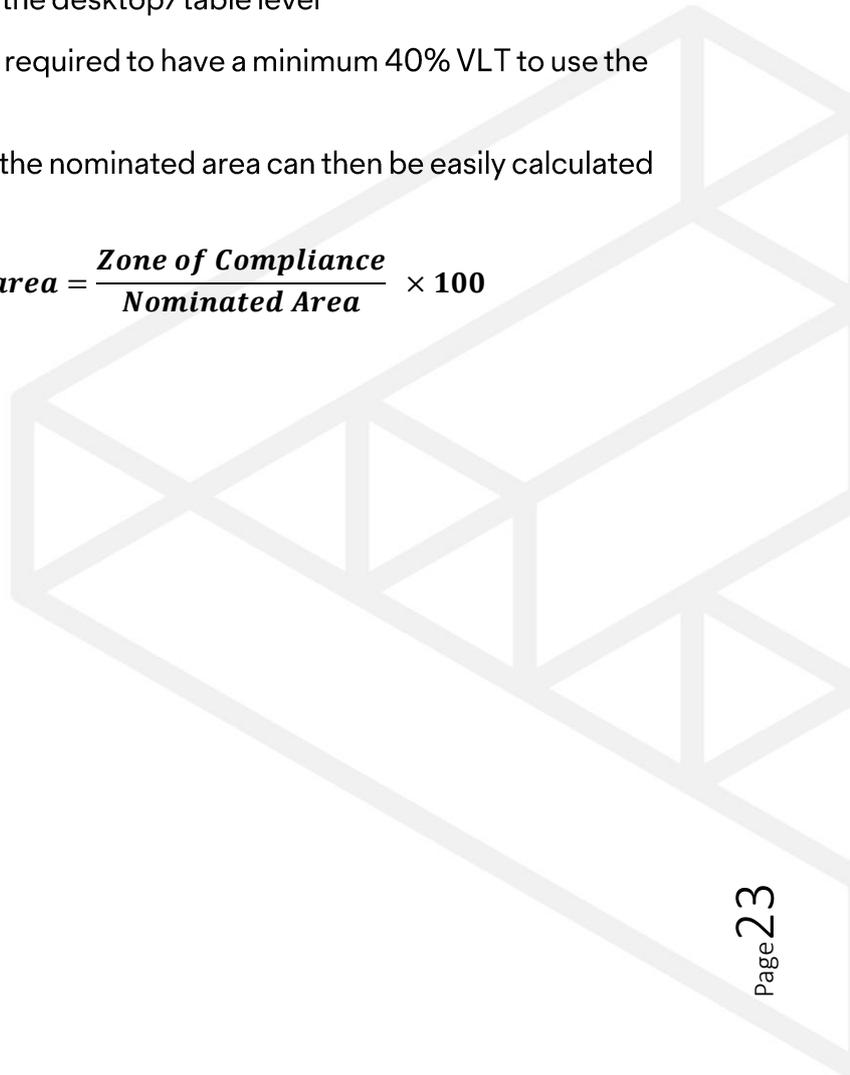
**w** is the width of the glazing serving the room

**h** is the height of the window head above the desktop/table level

Windows serving the nominated area are required to have a minimum 40% VLT to use the formula.

The percentage of compliant area within the nominated area can then be easily calculated with the following formula:

$$\text{Percentage of compliant area} = \frac{\text{Zone of Compliance}}{\text{Nominated Area}} \times 100$$



## Site Description

The proposed new development consists of a childcare. The areas such as stairs, toilets, laundries and transient spaces will not be occupied regularly, hence not included. The nominated areas for the Hand Calculation are only comprised of the children's room's, library, lego, art, stem and office spaces which will be regularly occupied.

The desktop/table level has been estimated to be 700mm for office spaces.

The desktop/table level has been estimated to be 400mm for children's room's.

See below for the mark-up of the compliant zone (orange) within each nominated area (light blue).

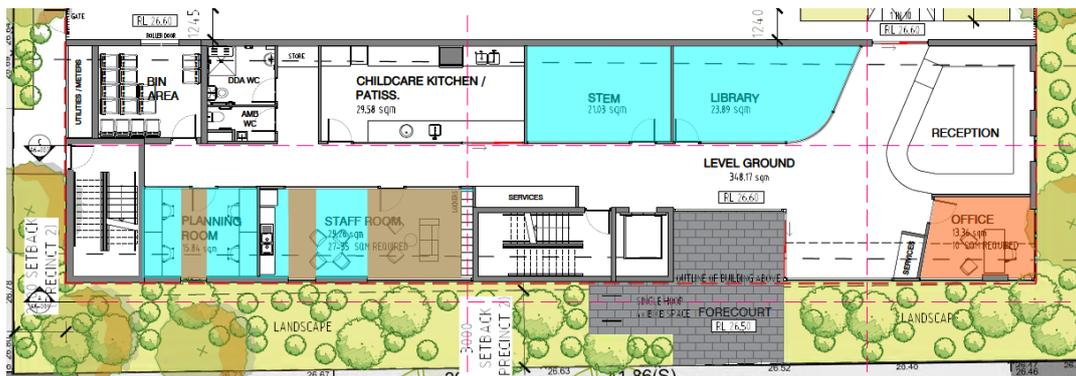


Figure 3: Compliance zone for Ground Floor

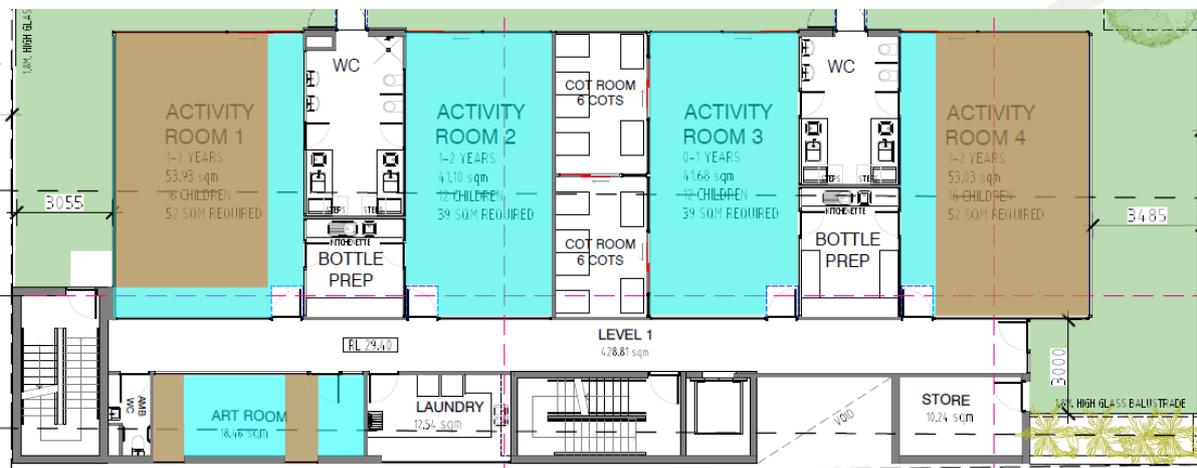


Figure 4: Compliance zone for First Floor

Please note, that daylight has not been applied to Activity Rooms 2 and 3 as the horizontal projection of the second floor play area overshadows the windows, significantly reducing the effectiveness of natural light in these spaces.

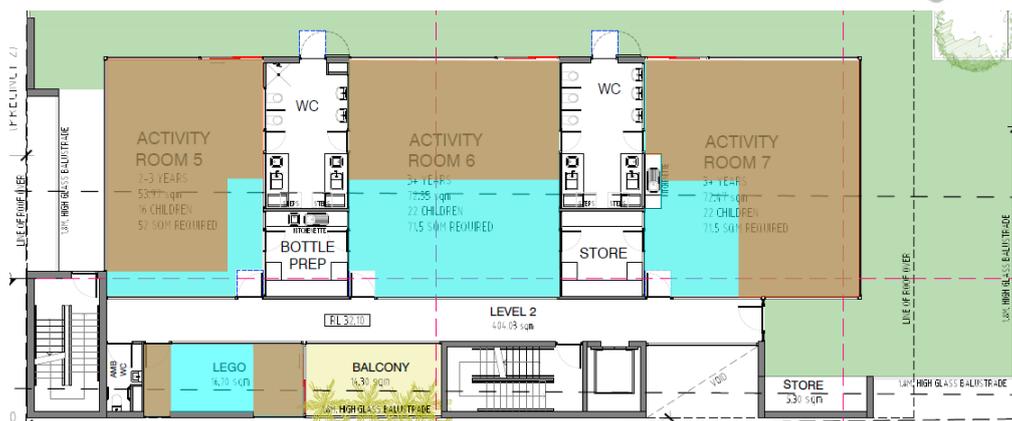


Figure 5: Compliance zone for Second Floor

	Nominated Areas (m <sup>2</sup> )	Compliant Areas (m <sup>2</sup> )	Compliant Areas (%)
GF - Planning Room	16	4	
GF - Staff Room	25	17	
GF - Library	24	0	
GF - Stem	21	0	
GF - Office	13	13	
FF - Art Room	17	6	
FF - Activity 1	54	40	
FF - Activity 2	41	0	
FF - Activity 3	42	0	
FF - Activity 4	53	44	
SF - Activity 5	53	44	
SF - Activity 6	72	37	
SF - Activity 7	72	58	
SF - Lego	16	8	
<b>TOTAL</b>	<b>519</b>	<b>269</b>	<b>52%</b>

The green star hand calculation for the proposed childcare shows that the development will achieve and exceed SDAPP best practice requirement with all regularly occupied spaces achieving 52% of floor area at 2% daylight factor.



## APPENDIX D – VOC & FORMALDEHYDE EMISSION LIMITS

The following table are an extract of the Green Star Design and as built submission guidelines:

**Table 13.1.1: Maximum TVOC Limits for Paints, Adhesives and Sealants**

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

The product complies with the Total VOC (TVOC) limits specified in the Table below.

### Carpet Test Standards and TVOC Emissions Limits

Test protocol	Limit
ASTM D5116 - Total VOC limit	0.5mg/m <sup>2</sup> per hour
ASTM D5116 - 4-PC (4-Phenylcyclohexene)	0.05mg/m <sup>2</sup> per hour
ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m <sup>2</sup> per hour
ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m <sup>2</sup> per hour



**Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products**

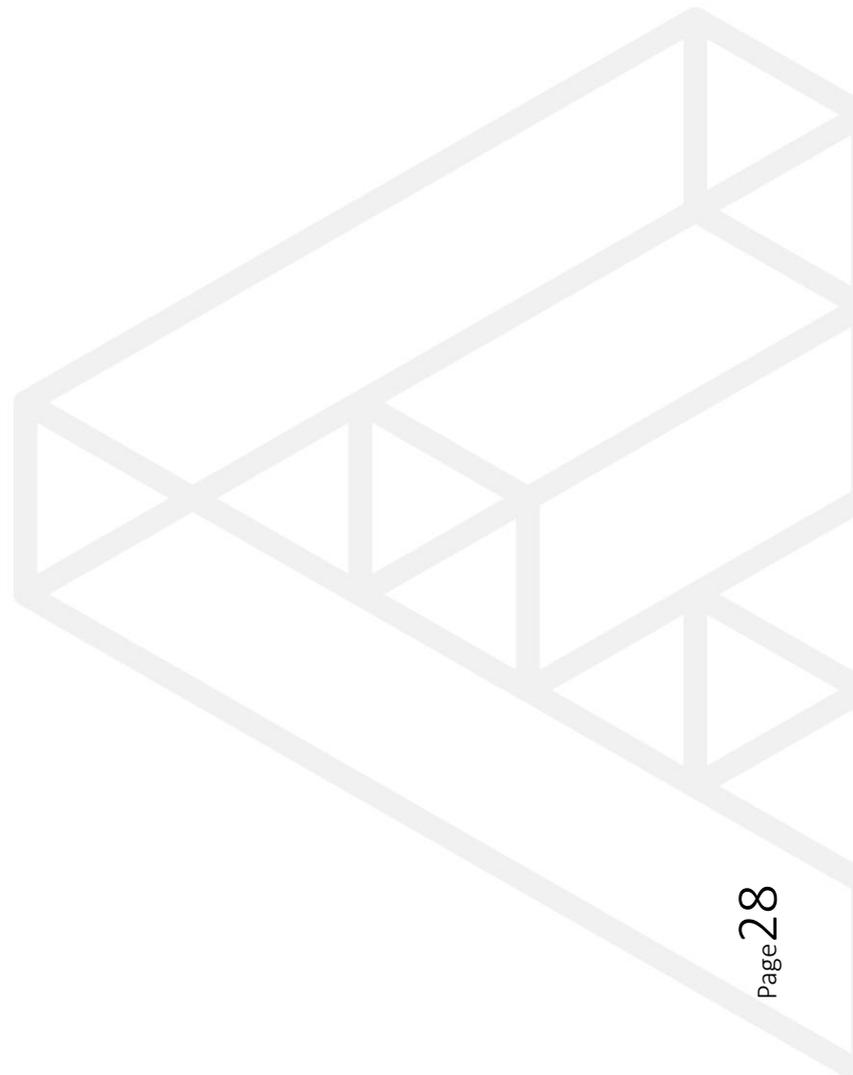
Test Protocol	Emission Limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m <sup>2</sup> hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m <sup>2</sup> hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m <sup>2</sup> hr (at 3 days)
ASTM D6007	≤0.12mg/m <sup>3</sup> **
ASTM E1333	≤0.12mg/m <sup>3</sup> ***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m <sup>3</sup>
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m <sup>2</sup> hr

\*mg/m<sup>2</sup>hr may also be represented as mg/m<sup>2</sup>/hr.



## APPENDIX E – BESS ASSESSMENT

Please note, the non-potable water source for the development is connected to the Rainwater Tank 1 in BESS, a screenshot on the BESS scorecard has been provided for clarity.



# BESS Report

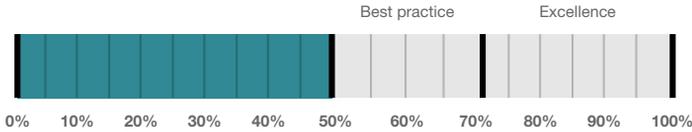
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 438-440 Barkly St Footscray Victoria 3011. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Maribyrnong City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

## Your BESS Score



# 54%

## Project details

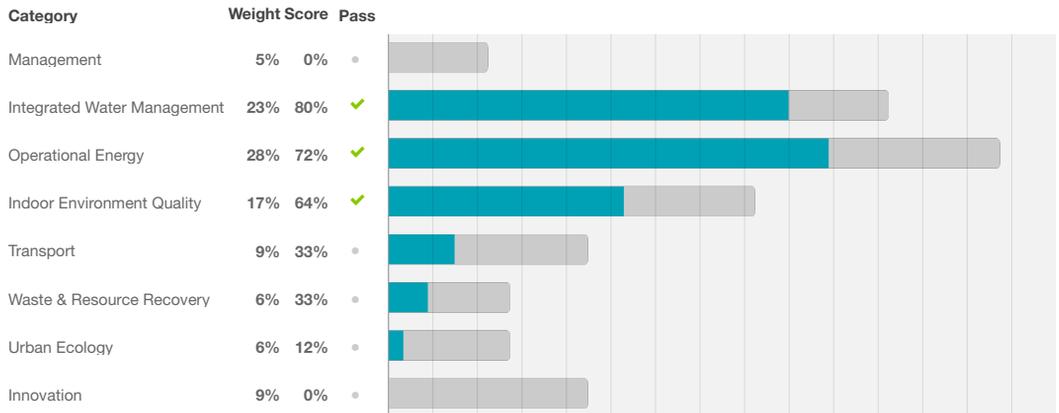
**Name** 438-440 Barkly Street, Footscray VIC, Australia  
**Address** 438-440 Barkly St Footscray Victoria 3011  
**Project ID** 8AAD8F43-R2  
**BESS Version** BESS-9

**Site type** Non-residential development  
**Account** hunter@fraterconsultingservices.com.au  
**Application no.**  
**Site area** 1,306 m<sup>2</sup>  
**Building floor area** 1,181 m<sup>2</sup>  
**Date** 14 November 2025  
**Software version** 2.2.0-B.628



## Performance by category

● This project ● Maximum available



## Buildings

Name	Height	Footprint	% of total footprint
Childcare	3	1,181 m <sup>2</sup>	100%

## Dwellings & Non Res Spaces

### Non-Res Spaces

Name	Quantity	Area	Building	% of total area
<b>Public building</b>				
Childcare	1	1,181 m <sup>2</sup>	Childcare	100%
<b>Total</b>	<b>1</b>	<b>1,181 m<sup>2</sup></b>	<b>100%</b>	

## Supporting Evidence

### Shown on Floor Plans

Credit	Requirement	Response	Status
Integrated Water Management 2.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Integrated Water Management 3.1	Annotation: Water efficient garden details		-
Transport 1.4	Location of non-residential bicycle parking spaces		-
Transport 1.5	Location of non-residential visitor bicycle parking spaces		-
Waste & Resource Recovery 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Location and size of vegetated areas		-

### Supporting Documentation

Credit	Requirement	Response	Status
Integrated Water Management 2.1	STORM report or MUSIC model		-
Operational Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Operational Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Indoor Environment Quality 1.4	A short report detailing assumptions used and results achieved.		-

## Credit summary

### Management Overall contribution 4.5%

		<b>0%</b>
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		0%
3.2 Metering - Non-Residential		N/A <span style="color: orange;">✦</span> Scoped Out
		No more than one tenant.
3.3 Metering - Common Areas		0%
4.1 Building Users Guide		0%

### IWM Overall contribution 22.5%

		<b>80%</b>	<span style="color: green;">✔</span> Pass
1.1 Potable Water Use		41%	<span style="color: green;">✔</span> Achieved
2.1 Stormwater Treatment		100%	<span style="color: green;">✔</span> Achieved
3.1 Water Efficient Landscaping		100%	
4.1 Building Systems Water Use		N/A	<span style="color: orange;">✦</span> Scoped Out
			N/A

### Operational Energy Overall contribution 27.5%

		<b>Minimum required 50%</b>	<b>72%</b>	<span style="color: green;">✔</span> Pass
1.1 Thermal Performance Rating - Non-Residential		37%		
2.1 Greenhouse Gas Emissions		100%		
2.2 Peak Demand		100%		
2.6 Electrification		100%		
2.7 Energy consumption		100%		
3.1 Carpark Ventilation		N/A	<span style="color: orange;">✦</span> Scoped Out	
				N/A
3.2 Hot Water - Non-Residential		100%		
3.7 Internal Lighting - Non-Residential		100%		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	<span style="color: orange;">✦</span> Scoped Out	
				No cogeneration or trigeneration system in use.
4.2 Renewable Energy Systems - Solar		0%	<span style="color: grey;">⊘</span> Disabled	
				No solar PV renewable energy is in use.
4.4 Renewable Energy Systems - Other		N/A	<span style="color: orange;">✦</span> Scoped Out	
				No other (non-solar PV) renewable energy is in use.

**IEQ Overall contribution 16.5%**

		<b>Minimum required 50%</b>	<b>64%</b>	<b>✓ Pass</b>
1.4	Daylight Access - Non-Residential		52%	✓ Achieved
2.3	Ventilation - Non-Residential		66%	✓ Achieved
3.4	Thermal comfort - Shading - Non-Residential		96%	
3.5	Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1	Air Quality - Non-Residential		100%	

**Transport Overall contribution 9.0%**

			<b>33%</b>	
1.4	Bicycle Parking - Non-Residential		100%	
1.5	Bicycle Parking - Non-Residential Visitor		100%	
1.6	End of Trip Facilities - Non-Residential		0%	
2.1	Electric Vehicle Infrastructure		0%	
2.2	Car Share Scheme		0%	
2.3	Motorbikes / Mopeds		0%	

**Waste & Resource Recovery Overall contribution 5.5%**

			<b>33%</b>	
1.1	Construction Waste - Building Re-Use		0%	
2.1	Operational Waste - Food & Garden Waste		0%	
2.2	Operational Waste - Convenience of Recycling		100%	

**Urban Ecology Overall contribution 5.5%**

			<b>12%</b>	
1.1	Communal Spaces		0%	
2.1	Vegetation		25%	
2.2	Green Roofs		0%	
2.3	Green Walls and Facades		0%	
3.2	Food Production - Non-Residential		0%	

**Innovation Overall contribution 9.0%**

			<b>0%</b>	
1.1	Innovation		0%	

## Credit breakdown

### Management Overall contribution 4.5%

	0%
--	----

<b>1.1 Pre-Application Meeting</b>	0%
------------------------------------	----

Score Contribution	This credit contributes 42.9% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	No

<b>2.3 Thermal Performance Modelling - Non-Residential</b>	0%
--	----

Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?
Question	Criteria Achieved ?
Public building	No

Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Public building	No

<b>3.2 Metering - Non-Residential</b>	N/A  Scoped Out
	No more than one tenant.

This credit was scoped out	No more than one tenant.
----------------------------	--------------------------

<b>3.3 Metering - Common Areas</b>	0%
------------------------------------	----

Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Public building	No

<b>4.1 Building Users Guide</b>	0%
---------------------------------	----

Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	No

**IWM Overall contribution 22.5%**

		80% <span style="color: green;">✔</span> Pass
--	--	---

Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No

<b>Stormwater profile</b>	
Which stormwater modelling software are you using?:	Melbourne Water STORM tool
STORM score achieved:	100
Flow:	-
Total Suspended Solids:	-
Total Phosphorus:	-
Total Nitrogen:	-

<b>Rainwater tank profile</b>	
What is the total roof area connected to the rainwater tank?: Rainwater Tank 1	561 m <sup>2</sup>
Tank Size: Rainwater Tank 1	15,000 Litres
Irrigation area connected to tank: Rainwater Tank 1	0.0 m <sup>2</sup>
Is connected irrigation area a water efficient garden?: Rainwater Tank 1	No
Other external water demand connected to tank?: Rainwater Tank 1	0.0 Litres/Day

<b>Fixtures, fittings &amp; connections profile</b>	
Building:	Childcare
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 6 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	>= 3 Star WELS rating
Which non-potable water source is the dwelling/space connected to?:	235776 <small>Which non-potable water source is the dwelling/space connected to? Rainwater Tank 1</small>
Non-potable water source connected to Toilets:	Yes
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No

1.1 Potable Water Use		41% <span style="color: green;">✔</span> Achieved
-----------------------	--	---

Score Contribution	This credit contributes 33.3% towards the category score.		
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.		
Output	Reference		
Project	5282 kL		
Output	Proposed (excluding rainwater and recycled water use)		
Project	4199 kL		
Output	Proposed (including rainwater and recycled water use)		
Project	3919 kL		
Output	% Reduction in Potable Water Consumption		
Project	25 %		
Output	% of connected demand met by rainwater		
Project	39 %		
Output	How often does the tank overflow?		
Project	Never / Rarely		
Output	Opportunity for additional rainwater connection		
Project	2287 kL		
<b>2.1 Stormwater Treatment</b>			100% <span style="color: green;">✔</span> Achieved
Score Contribution	This credit contributes 60% towards the category score.		
Criteria	Has best practice stormwater management been demonstrated?		
Output	Min STORM Score		
Project	100		
Output	STORM Score		
Project	100		
<b>3.1 Water Efficient Landscaping</b>			100%
Score Contribution	This credit contributes 6.7% towards the category score.		
Criteria	Will water efficient landscaping be installed?		
Question	Criteria Achieved ?		
Project	Yes		
<b>4.1 Building Systems Water Use</b>			N/A <span style="color: orange;">✦</span> Scoped Out
			N/A
This credit was scoped out	N/A		

**Operational Energy Overall contribution 27.5%**

		Minimum required 50%	72%	✔ Pass
--	--	----------------------	-----	--------

<b>Project profile</b>	
Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:	Yes
Are you installing any renewable energy system(s) (other than solar photovoltaic)?:	No
Energy Supply:	All-electric
<b>Non-residential Deemed-to-Satisfy profile</b>	
Do all exposed floors and ceilings (forming part of the envelope) demonstrate meeting the required NCC2022 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2022 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
<b>1.1 Thermal Performance Rating - Non-Residential</b>	37%
Score Contribution	This credit contributes 36.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?
<b>2.1 Greenhouse Gas Emissions</b>	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
<b>2.2 Peak Demand</b>	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
<b>2.6 Electrification</b>	100%
Score Contribution	This credit contributes 13.6% towards the category score.
Criteria	Is the development all-electric?
Question	Criteria Achieved?
Project	Yes
<b>2.7 Energy consumption</b>	100%

Score Contribution	This credit contributes 18.2% towards the category score.	
Criteria	What is the % reduction in annual energy consumption against the benchmark?	
<b>3.1 Carpark Ventilation</b>		N/A  Scoped Out
N/A		
This credit was scoped out	N/A	
<b>3.2 Hot Water - Non-Residential</b>		100%
Score Contribution	This credit contributes 4.5% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
<b>3.7 Internal Lighting - Non-Residential</b>		100%
Score Contribution	This credit contributes 9.1% towards the category score.	
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J7D3a of the NCC 2022 Vol 1?	
Question	Criteria Achieved ?	
Public building	Yes	
<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A  Scoped Out
No cogeneration or trigeneration system in use.		
This credit was scoped out	No cogeneration or trigeneration system in use.	
<b>4.2 Renewable Energy Systems - Solar</b>		0%  Disabled
No solar PV renewable energy is in use.		
This credit is disabled	No solar PV renewable energy is in use.	
<b>4.4 Renewable Energy Systems - Other</b>		N/A  Scoped Out
No other (non-solar PV) renewable energy is in use.		
This credit was scoped out	No other (non-solar PV) renewable energy is in use.	

**IEQ Overall contribution 16.5%**

		<b>Minimum required 50%</b>	<b>64%</b> <span style="color: green;">✔</span> <b>Pass</b>
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<b>1.4 Daylight Access - Non-Residential</b>		52%	<span style="color: green;">✔</span> <b>Achieved</b>
--	--	-----	--

Score Contribution	This credit contributes 35.3% towards the category score.
Criteria	What % of the nominated floor area has at least 2% daylight factor?
Question	Percentage Achieved?
Public building	52 %

<b>2.3 Ventilation - Non-Residential</b>		66%	<span style="color: green;">✔</span> <b>Achieved</b>
--	--	-----	--

Score Contribution	This credit contributes 35.3% towards the category score.
Criteria	What % of the regular use areas are effectively naturally ventilated?
Question	Percentage Achieved?
Public building	60 %

Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?
Question	Percentage Achieved?
Public building	50 %

Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Public building	-

<b>3.4 Thermal comfort - Shading - Non-Residential</b>		96%	
--	--	-----	--

Score Contribution	This credit contributes 17.6% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Public building	95 %

<b>3.5 Thermal Comfort - Ceiling Fans - Non-Residential</b>		0%	
---	--	----	--

Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Public building	-

<b>4.1 Air Quality - Non-Residential</b>		100%	
--	--	------	--

Score Contribution	This credit contributes 5.9% towards the category score.
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Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

**Transport Overall contribution 9.0%**

		<b>33%</b>
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<b>1.4 Bicycle Parking - Non-Residential</b>		<b>100%</b>
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Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	2

<b>1.5 Bicycle Parking - Non-Residential Visitor</b>		<b>100%</b>
--	--	-------------

Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	1

<b>1.6 End of Trip Facilities - Non-Residential</b>		<b>0%</b>
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Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?
Question	Number of showers provided ?
Public building	-
Question	Number of lockers provided ?
Public building	-
Output	Min Showers Required
Public building	1
Output	Min Lockers Required
Public building	2

<b>2.1 Electric Vehicle Infrastructure</b>		<b>0%</b>
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Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	No

<b>2.2 Car Share Scheme</b>		<b>0%</b>
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Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No

<b>2.3 Motorbikes / Mopeds</b>		0%
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Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	No

**Waste & Resource Recovery Overall contribution 5.5%**

		<b>33%</b>
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<b>1.1 Construction Waste - Building Re-Use</b>		0%
---	--	----

Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No

<b>2.1 Operational Waste - Food &amp; Garden Waste</b>		0%
--	--	----

Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	No

<b>2.2 Operational Waste - Convenience of Recycling</b>		100%
---	--	------

Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

**Urban Ecology Overall contribution 5.5%**

		12%
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<b>1.1 Communal Spaces</b>		0%
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Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m <sup>2</sup> for each of the first 50 occupants * Additional 0.5m <sup>2</sup> for each occupant between 51 and 250 * Additional 0.25m <sup>2</sup> for each occupant above 251?	
Question	Common space provided	
Public building	-	
Output	Minimum Common Space Required	
Public building	84 m <sup>2</sup>	

<b>2.1 Vegetation</b>		25%
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Score Contribution	This credit contributes 50% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	5 %	

<b>2.2 Green Roofs</b>		0%
------------------------	--	----

Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	

<b>2.3 Green Walls and Facades</b>		0%
------------------------------------	--	----

Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	

<b>3.2 Food Production - Non-Residential</b>		0%
--	--	----

Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Public building	-	
Output	Min Food Production Area	
Public building	30 m <sup>2</sup>	

**Innovation Overall contribution 9.0%**

	0%
--	----

<b>1.1 Innovation</b>	0%
-----------------------	----

Score Contribution	This credit contributes 100% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

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# ARBORICULTURAL IMPACT ASSESSMENT

438-440 BARKLY ST, FOOTSCRAY

**PREPARED BY:**

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**JANUARY 2026**

VERSION	AUTHOR	FILE NAME	DATE
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## 1.0 INTRODUCTION

- 1.1.1 This report has been prepared to provide an arboricultural impact assessment for trees located adjacent to 438-440 Barkly St, Footscray. This report has been prepared in response to item 5 of an RFI issued by Maribyrnong City Council, application TP399/2025(1), for 438-440 Barkly Street Footscray, seeking an arboricultural impact assessment in accordance with AS4970-2009 *Protection of Trees on Development Sites*.
- 1.1.2 The site has been cleared of all buildings and woody vegetation. All neighbouring trees have been assessed in road reserves and on adjacent private land.
- 1.1.3 The subject site is rectangular in plan, with a broad combined frontage to Barkly Street. Single dwellings that front Eleanor Street to the west and Everard Street to the east about the northern site boundary. The site is relatively flat.
- 1.1.4 Trees were assessed on 15<sup>th</sup> January 2026.

## 2.0 SUBJECT TREES

### 2.1 OVERVIEW

- 2.1.1 Four trees have been assessed as part of this study, all located outside the site.
- 2.1.2 The definition of a tree as defined in AS4970-2009 *Protection of trees on development sites* has been used as the threshold for assessment, being a “long lived woody perennial plant usually greater than 3 m in height with one or relatively few main stems or trunks” (Standards Australia, p. 5).

### 2.2 TREES OUTSIDE THE SITE

- 2.2.1 Three Chinese Elms (*Ulmus parvifolia*) have been assessed in adjacent road reserves:
- Tree 1, located to the east of the site in a raised roadside garden bed within Everard Street.
  - Tree 3 and 4, located to the south of the site within footpath cutouts in the Barkly Street road reserve.
- 2.2.2 The fourth tree assessed is a Queen Palm (*Syagrus romanzoffiana*), Tree 2, located in the rear garden of 113 Eleanor Street to the north.
- 2.2.3 All trees assessed are exotic species and are not considered native under Victorian planning provisions.
- 2.2.4 Trees assessed as part of this study are summarised in Table 1.

TABLE 1 ASSESSED TREES

ID	Taxon, Common Name	Arb. Value
1	<i>Ulmus parvifolia</i> , Chinese Elm	Outside site - Moderate
2	<i>Syagrus romanzoffiana</i> , Queen Palm	Outside site - Low
3	<i>Ulmus parvifolia</i> , Chinese Elm	Outside site - Moderate
4	<i>Ulmus parvifolia</i> , Chinese Elm	Outside site - Moderate

## 3.0 IMPACT ASSESSMENT

### 3.1 PROPOSAL

3.1.1 Development of the site, comprising development of a childcare facility, is proposed. The following drawings have been reviewed against the guidelines of AS4970-2009 *Protection of trees on development sites*.

*Proposed Site Plan TP1-002 Rev A 30.10.25*

*Proposed Level Ground Floor Plan TP2-001 Rev A 30.10.25*

*438 Barkly Street Footscray*

*Prepared by Architecton*

### 3.2 NEIGHBOURING TREES

3.2.1 There are no encroachments noted into the tree protection zones (TPZs) of any neighbouring trees by built form or construction of new vehicle crossings into the site.

3.2.2 The crowns of the trees do not significantly overlap site boundaries, and pruning for construction is not anticipated to be required.

3.2.3 The only potential for encroachment is likely to be for installation of new underground services within the road reserve. These should either be installed outside nominated TPZs or non-destructively installed using directional boring or hydro-excavation if required within a TPZ (eg for a nominated legal point of discharge).

## 4.0 TREE ASSESSMENT DATA

	<b>TREE: 1</b>	<i>Ulmus parvifolia</i> , Chinese Elm			
	<b>ORIGIN:</b>	<b>HEALTH:</b>	<b>STRUCTURE:</b>	<b>FORM:</b>	<b>ULE:</b>
	Exotic	Good	Fair-good	Symmetrical	20+years
	<b>AGE:</b>	<b>HEIGHT (m):</b>	<b>WIDTH (m):</b>	<b>DSH (cm):</b>	<b>TPZ (m):</b>
	Semi-mature	7	6	18	2.2
			<b>DAB (cm):</b>	<b>SRZ (m):</b>	
			25	1.9	
<b>NOTES</b> In raised kerb garden bed				<b>ARBORICULTURAL RATING:</b> Moderate	

	<b>TREE: 2</b>	<i>Syagrus romanzoffiana</i> , Queen Palm			
	<b>ORIGIN:</b>	<b>HEALTH:</b>	<b>STRUCTURE:</b>	<b>FORM:</b>	<b>ULE:</b>
	Exotic	Fair-good	Fair-good	Symmetrical	20+years
	<b>AGE:</b>	<b>HEIGHT (m):</b>	<b>WIDTH (m):</b>	<b>DSH (cm):</b>	<b>TPZ (m):</b>
	Semi-mature	9	6	25	4.0
<b>NOTES</b> Well back from boundary				<b>ARBORICULTURAL RATING:</b> Low	

	<b>TREE: 3</b>	<i>Ulmus parvifolia</i> , Chinese Elm			
	<b>ORIGIN:</b>	<b>HEALTH:</b>	<b>STRUCTURE:</b>	<b>FORM:</b>	<b>ULE:</b>
	Exotic	Good	Fair-good	Symmetrical	20+years
	<b>AGE:</b>	<b>HEIGHT (m):</b>	<b>WIDTH (m):</b>	<b>DSH (cm):</b>	<b>TPZ (m):</b>
	Semi-mature	6	4	17	2.1
			<b>DAB (cm):</b>	<b>SRZ (m):</b>	
			25	1.9	
<b>NOTES</b>				<b>ARBORICULTURAL RATING:</b> Moderate	

	<b>TREE: 4</b>		<i>Ulmus parvifolia</i> , Chinese Elm		
	<b>ORIGIN:</b> Exotic	<b>HEALTH:</b> Good	<b>STRUCTURE:</b> Fair-good	<b>FORM:</b> Symmetrical	<b>ULE:</b> 20+years
	<b>AGE:</b> Semi-mature	<b>HEIGHT (m):</b> 6	<b>WIDTH (m):</b> 3	<b>DSH (cm):</b> 17 <b>DAB (cm):</b> 23	<b>TPZ (m):</b> 2.1 <b>SRZ (m):</b> 1.8
	<b>NOTES</b>			<b>ARBORICULTURAL RATING:</b> Moderate	

## 5.0 DESCRIPTORS

**Taxon:** Botanical name of tree.

**Common Name:** Accepted common name of taxon

Sources for Taxon and Common Names:

Flora of Victoria online (<https://vicflora.rbg.vic.gov.au/>)

*Horticultural Flora of South Eastern Australia* (Vols. 1-5)

### Origin:

Indigenous      Naturally occurring taxon within locale. Considered Native under planning scheme provisions  
Victoria          Naturally occurring taxon within Victoria. Considered Native under planning scheme provisions  
Australia        Australian native. Occurs naturally within Australia, but outside Victoria.  
Exotic.           Introduced taxon to Australia.

**DSH (DBH):**      Diameter at breast height (1.4m), in centimetres.

**DAB:**            Diameter of trunk immediately above root buttress, in centimetres.

**Height:**         Height of tree, in metres.

**Width:**         Estimated width of tree, in metres.

**TPZ:**            Tree Protection Zone calculated in accordance with AS4970-2009 *Protection of Trees on Development Sites*.

**SRZ:**            Structural Root Zone calculated in accordance with AS4970-2009 *Protection of Trees on Development Sites*.

**Form**            Shape of tree crown

### Age

Juvenile:        Young, recently planted tree.

Semi-mature:    Tree is developing and established.

Mature:         Specimen has reached expected size in current situation, limited extension growth.

Over-mature:    Specimen entering stage of decline, declining health.

Senescent        Tree is in advancing decline.

### Health

Good:      Optimal vigour for this taxon. Crown full with good density, foliage entire, with good colour, minimal or no pathogen damage. Good growth indicators, e.g. extension growth. No or minimal canopy dieback. Good wound-wood and callus formation.

Fair: Tree is exhibiting one or more of the following:

Tree has <30% deadwood. Or can have minor canopy dieback. Foliage generally with good colour, some discolouration may be present, minor pathogen damage present. Typical growth indicators, e.g. extension growth, leaf size, canopy density for species in location may be slightly abnormal.

Poor: Tree has >30% deadwood. Canopy dieback present. Discoloured or distorted leaves and/or excessive epicormic re-growth. Pathogen is present and/or stress symptoms that could lead to or are contributing to the decline of tree.

Dead: Tree is dead.

### Structure

Good: Optimal structure for this taxon. Sound branch attachment and/or no minor structural defects. Trunk and scaffold branches sound or only minor damage. Good trunk and scaffold branch taper. No branch over extension. No damage to structural roots, good buttressing present. No obvious root pests or diseases.

Fair: Some minor structural defects and/or minimal damage to trunk. Bark missing. Cavities could be present. Minimal or no damage to structural roots. Typical structure for species.

Poor: Major structural defects and/or trunk damaged and/or missing bark. Large cavities and/or girdling or damaged roots that are problematic.

### Useful Life Expectancy (ULE)

The length of time a tree can be maintained as a useful amenity specimen. Contingent on a number of factors including expected life-span of the taxon, health and structure, pest and diseases, weed status.

### Arboricultural Value

None A tree in irreversible decline.

Self-sown environmental weed. Declared noxious weed.

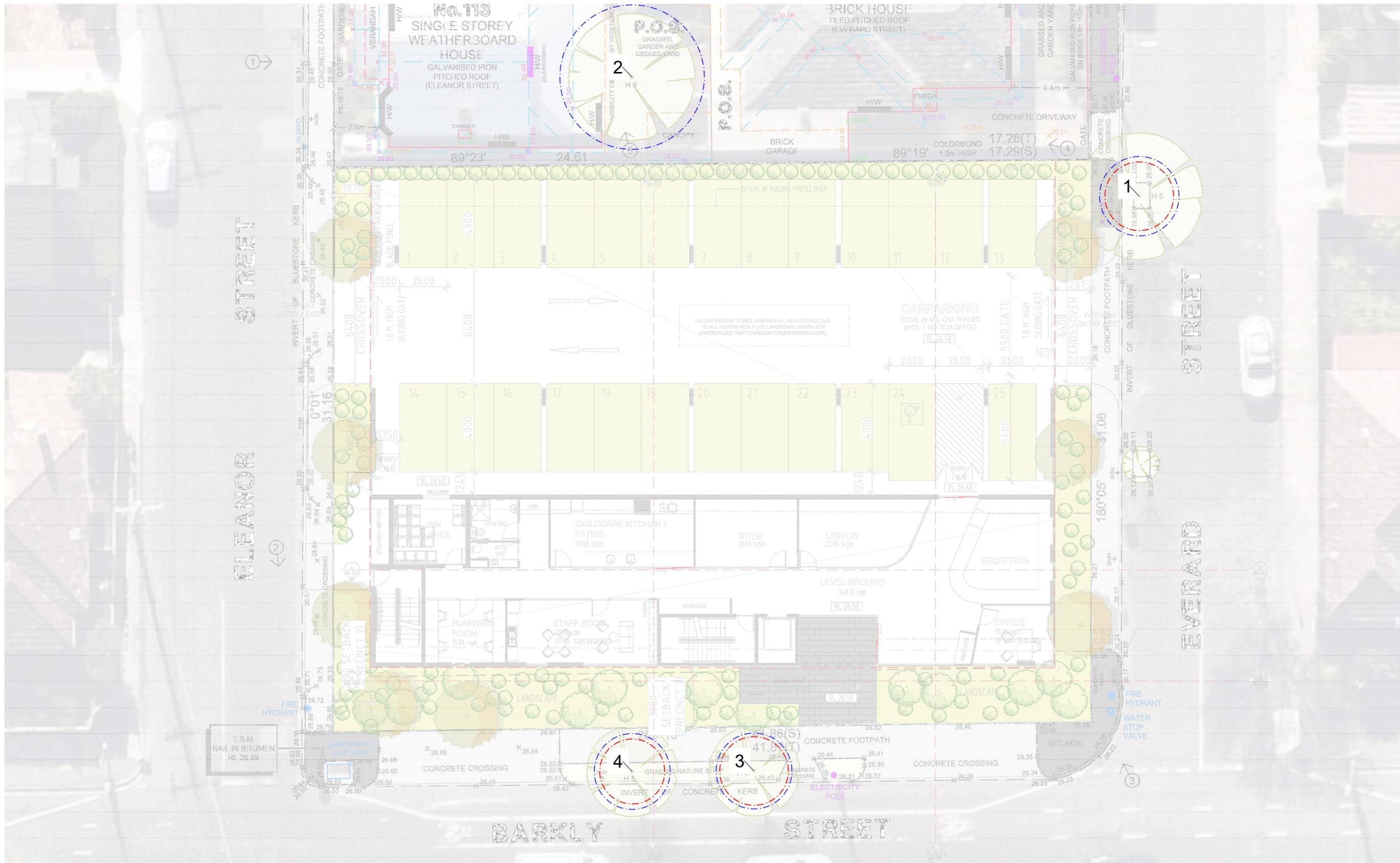
Low Small tree of little contribution to the landscape. Tree with limited useful life expectancy (< 10 years) due to compromised health and/or structure.

Moderate Developing tree yet to achieve fully mature proportions but contributes to the immediate landscape and with a long, potential useful life expectancy of more than 20 years.

Mature and over-mature specimens with reduced health and/or structural ratings that limit the useful life expectancy to less than 20 years.

High A well-established semi-mature, mature or over-mature tree with a strong contribution to the landscape, in overall fair-good condition, with a useful life expectancy of more than 20 years.

## 6.0 TREE LOCATION / IMPACT PLAN



**438-440 BARKLY STREET, FOOTSCRAY**

**TREE LOCATION PLAN**

Address  
Drawing



26-01-04	1:200@A3
Job N°.	Scale
19.01.2026	SH
Date	Drawn



TS 01  
Drawing N° Revision

