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Environmental Noise Assessment

Proposed Child Care Centre

169 Weston Street, Panania, NSW

REPORT No
8128-1.1R Rev A

DATE ISSUED
20 June 2025

Prepared For:
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Revision History

Report	Date	Prepared	Checked	Comment
Final	30/05/2025	Ricky Thom	Stephen Gauld	
Rev A	20/06/2025	Ricky Thom	Stephen Gauld	Updated architectural drawings

Document 8128-1.1R REV A, 39 pages plus attachments

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1.0 EXECUTIVE SUMMARY

A new child care centre (The Centre) is proposed to be constructed at 169 Weston Street, Panania, NSW (the Site). The Site is located on land zoned R3 – *Medium Density Residential* under the Canterbury-Bankstown Local Environmental Plan (LEP) 2023.

The Site is bounded by Weston Street to the north, and residential premises to the east, south and west. A train line is located on the opposite side of Weston Street.

The proposal will involve the demolition of the current residence and construction of a new two-storey child care centre building. The Centre will comprise of two outdoor play areas, two indoor play areas, cot room, office, lobby, kitchen, amenities and a basement level car park with capacity for 8 vehicles.

The architectural drawings relied on for this assessment are prepared by Design-Basix-Build dated June 2025, and attached in Appendix C.

The Centre will have a total capacity for 36 children, comprising of:

- 0-2 years old – 10 children;
- 2-3 years old – 14 children; and
- 3-5 years old – 12 children.

The proposed hours of operation for the Centre are:

- Monday to Friday: 7.00 am – 6.00 pm.

Nearby premises may be affected by the following noise sources at the Centre:

- Children playing both outside and inside;
- Car park and on-road traffic; and
- Mechanical plant.

Canterbury Bankstown Council requires an acoustic assessment to demonstrate that the noise impact from the Centre will not adversely affect the acoustic amenity of nearby residential premises.

Acceptable noise limits have been derived from the Association of Australasian Acoustical Consultants' (AAAC) '*Guideline for Child Care Centres Acoustic Assessment*' and the Environmental Protection Authority's (EPA) *Road Noise Policy* (RNP).

Calculations show that, provided the recommendations in Section 8.0 are implemented, the levels of noise emission from the Centre and of intrusive noise at the Centre will meet the acoustic requirements established in Section 5.5, and will therefore be acceptable.

2.0 CONSULTING BRIEF

Day Design Pty Ltd was engaged by Design-Basix-Build to assess the potential environmental noise impact from a proposed Child Care Centre to be constructed at 169 Weston Street, Panania, NSW. This commission involves the following:

Scope of Work:

- Inspect the site and environs
- Measure the background noise levels at critical locations and times
- Establish acceptable noise level criterion
- Prepare a site plan identifying the development and nearby noise sensitive locations
- Quantify noise emissions from the proposed Child Care Centre
- Quantify traffic noise intrusion to the site
- Calculate the level of noise emission, taking into account building envelope transmission loss, screen walls and distance attenuation
- Provide recommendations for noise control
- Prepare an Environmental Noise Assessment Report.

3.0 SITE AND DEVELOPMENT DESCRIPTION

3.1 Site Description

The Centre is proposed to be constructed at 169 Weston Street, Panania, NSW. The Site is located on land zoned R3 – *Medium Density Residential* under the Canterbury Bankstown Local Environmental Plan (LEP) 2023. The Site currently consists of a single-storey residential dwelling with a single shed within the backyard. Site access is via Weston Street.

The Site is bounded by Weston Street to the north, and residential premises to the east, south and west. A train line is also located on the opposite side of Weston Street. The Site and nearby receptors are shown in Figure 1.

The nearest noise sensitive receptors to the site are also shown in Figure 1, and are presented below in Table 1.

Table 1 Noise Sensitive Receptors

Receiver, Type & Location	Address	Direction from site
R1 – Residence – *RL 25.1* *1.5 m above ground level – 3 m from boundary*	167 Weston Street (single storey)	East
R2 – Residence – *RL 25.4* *1.5 m above ground level – 3 m from boundary*	165 Weston Street (single storey)	East
R3 – Residence – *RL 26.5* *1.5 m above ground level – 3 m from boundary*	33 Panorama Parade (single storey)	South-East
R4 – Residence – *RL 30.6* *outside north first floor window*	31 Panorama Parade (two storey)	South-East
R5 – Residence – *RL 25.9* *1.5 m above ground – 3 m from boundary*	7 Hinemoa Street (single storey)	South
R6a – Residence – *RL 25.6* *1.5 m above ground – 3 m from boundary*	5 Hinemoa Street (two storey)	South
R6b – Residence – *RL 27.5* *outside north first floor window*		
R7 – Residence – *RL 24.8* *1.5 m above ground – 3 m from boundary*	3 Hinemoa Street (single storey)	West
R8 – Residence – *RL 24.4* *1.5 m above ground – 3 m from boundary*	1 Hinemoa Street (single storey)	West

As the noise sources on the Site are at varying distances from the receptors, specific distances between each noise source and receptor are used in all calculations. All distances are based upon the architectural drawings.

Figure 1 – Location Plan – 169 Weston Street, Panania, NSW

3.2 Development Description

The proposal will involve the demolition of the current residence and construction of a new two-storey child care centre building for up to 36 children. The Centre will comprise of an outdoor play area, an indoor play area, office, lobby, kitchen, amenities on the ground floor and an outdoor play area, an indoor play area, a cot room and amenities on the first floor with a basement level car park with capacity for 8 vehicles with driveway access via Weston Street.

The proposed layout of the Centre can be seen in the architectural drawings prepared by Design-Basix-Build, attached as Appendix C.

The proposed hours of operation for the Centre are:

- Monday to Friday: 7.00 am – 6.00 pm.

The Centre will have a total capacity for 36 children, comprising of:

- 0-2 years old – 10 children;
- 2-3 years old – 14 children; and
- 3-5 years old – 12 children.

4.0 MEASURED NOISE LEVELS

Noise survey instrumentation used in this assessment is listed in Appendix A. A Glossary of Acoustical Terms is included as Datasheet AC108.

4.1 Measured Ambient Noise Levels

In order to assess the severity of a possible environmental noise problem in a residential area it is necessary to measure the ambient background noise level at the times and locations of worst possible annoyance. The lower the background noise level, the more perceptible the intrusive noise becomes and the more potentially annoying.

The background noise level should be measured at a location most representative of the potentially affected receptors, in the absence of any noise sources that may be associated with the proposed development.

As specified in Section 3.1 "Background Noise Monitoring" of the AAAC's *'Guideline for Child Care Centre Acoustic Assessment'*, where a consultant is unable to measure the background noise level at the most affected residential receiver location, the consultant *'shall select another suitable and equivalent location. This measured representative noise environment should be used to establish relevant criteria for all sensitive receivers.'*

During our site inspection it was determined that the potentially *most affected sensitive receiver locations* are 'R1' to the east, 'R3' and 'R6a' to the south and 'R7' and 'R8' to the west of the proposed Centre. Therefore, suitable and equivalent locations – Location 'A' and Location 'B' (see below) – were selected to represent *the most affected sensitive receivers*. This measured representative noise environment has been used to establish the relevant criteria for all other sensitive receivers.

Day Design notes that the background noise in the area is mainly influenced by local fauna, occasional traffic noise from Weston Street, rail noise from the opposite side for Weston Street, and some neighbourhood noises (pets, people talking and occasional yard work).

Environmental noise monitors were placed at Location 'A' and Location 'B' at 169 Weston Street, Panania, NSW, from Thursday 27 March to Monday 7 April 2025, to determine the Rating Background Level. The microphone heights were approximately 1.5 metres above ground level.

As the Centre is not proposed to operate on weekends, ambient noise levels measured on Saturday 29 and Sunday 30 March, and Saturday 5 and Sunday 6 April, 2025, have been excluded from the assessment period.

The results of the background noise survey at Location 'A' and Location 'B' are shown in the attached Appendix B, and below in Table 2.

Table 2 Ambient Background Levels – 169 Weston Street, Panania, NSW

Noise Measurement Location	Time Period	L_{90} Rating Background Level
Location 'A' – Front Yard, 169 Weston Street	Early Morning (6:30 am – 7 am)	**48**
	Day (7 am to 6 pm)	**44**
Location 'B'– Rear Yard, 169 Weston Street	Early Morning (6:30 am – 7 am)	**49**
	Day (7 am to 6 pm)	**38**

Meteorological conditions during the measurement surveys typically consisted of clear skies with temperatures ranging from 11°C to 27°C. Periods of rainfall were recorded during the day on Saturday 29 March, 2025. Noise level measurements adversely affected by weather conditions have been removed from calculations, where required[1]. Noise level measurements are considered reliable and representative of the background noise levels at all nearby receptor locations.

[1] *Section B1.3 of the EPA's NSW Noise Policy for Industry, under 'Exception' states, 're-monitoring may not be required, where monitoring contains weather-affected data, if it can be ascertained that the affected samples are not within the expected 'quieter' times of an assessment period (day/evening/night); that is, those time periods where the lowest 10th percentile background noise level might occur.'*

4.2 Measured Road Traffic Noise Levels

The proposed development is affected by road traffic noise from Weston Street which carries low traffic volumes.

The weekday $L_{Aeq,\ 1\ hour}$ traffic noise levels measured at Location 'A' and Location 'B' are shown below in Table 3 and Table 4.

Table 3 Measured $L_{Aeq,\ 1\ hour}$ Road Traffic Sound Pressure Levels – Location 'A'

Time	$L_{Aeq,\ 1\ hour}$ Road Traffic Noise (dBA)					
	Friday 28/03	Monday 31/03	Tuesday 01/04	Wednesday 02/04	Thursday 03/04	Friday 04/04
7 – 8 am	56	57	59	66	67	62
8 – 9 am	56	59	59	63	69	58
9 – 10 am	57	57	68	49	61	46
10 – 11 am	55	61	47	50	59	50
11 – 12 pm	57	61	51	47	60	47
12 – 1 pm	62	50	48	46	46	48
1 – 2 pm	61	50	52	49	55	50
2 – 3 pm	52	64	53	50	51	59
3 – 4 pm	53	51	51	62	59	47
4 – 5 pm	69	56	50	58	62	53
5 – 6 pm	54	63	51	63	60	70

Table 4 Measured $L_{Aeq,\ 1\ hour}$ Road Traffic Sound Pressure Levels – Location 'B'

Time	$L_{Aeq,\ 1\ hour}$ Road Traffic Noise (dBA)					
	Friday 28/03	Monday 31/03	Tuesday 01/04	Wednesday 02/04	Thursday 03/04	Friday 04/04
7 – 8 am	59	58	57	61	62	57
8 – 9 am	57	56	55	59	64	57
9 – 10 am	63	59	66	55	73	53
10 – 11 am	54	59	52	54	72	53
11 – 12 pm	55	58	55	54	55	53
12 – 1 pm	59	55	53	52	52	53
1 – 2 pm	59	56	54	54	53	54
2 – 3 pm	56	60	56	54	59	58
3 – 4 pm	57	56	55	58	67	53
4 – 5 pm	62	56	55	56	66	55
5 – 6 pm	55	57	54	58	56	63

Based on the long-term measurements at Location 'A' and Location 'B', and the calculation method show in Appendix B, Section B3 of the NSW Road Noise Policy for the 'overall $L_{Aeq,\ (1\ hour)}$', the calculated day time traffic noise level is 62 dBA at Location 'A' and 59 dBA at Location 'B'. These levels are used in the calculation of traffic noise intrusion for the existing site within Section 7.0 of this report.

5.0 ACOUSTIC CRITERIA

This Section presents the noise guidelines applicable to this proposal and establishes the Project Specific Noise Criteria.

5.1 Canterbury-Bankstown Council - Development Control Plan 2024

Canterbury-Bankstown Council in its Canterbury-Bankstown Development Control Plan (DCP) 2023, Chapter 10.1 – Child Care Centres, Section 5 – Acoustic Privacy outlines the following requirements in relation to acoustics:

'***Development controls***

Acoustic Privacy

5.1 Air conditioning, mechanical ventilation or any other continuous noise source must not exceed the ambient level at any specified boundary by more than 5 dB(A).

5.2 The location and design of child care facilities must consider the projection of noise from various activities to avoid any adverse impacts on the residential amenity of adjoining land.

For the purpose of this clause, Council requires applications to submit an Acoustic Report prepared by a suitably qualified acoustic consultant to determine:

1) *Existing noise levels at the identified sensitive receiver locations;*
2) *Likely noise levels to emanate from the child care facility at the identified sensitive receiver locations;*
3) *Whether the development must apply measures to ensure the noise of children playing in outdoor areas does not exceed 10 dB(A) above the background noise level;*
4) *Whether the location and setbacks of the development are sufficient to protect the acoustic privacy of adjacent dwellings;*
5) *Whether the location of outdoor areas should avoid living areas and bedrooms of adjacent dwellings; and*
6) *Whether the development must install certain noise attenuation measures to protect the acoustic privacy of adjacent dwellings.*

The Acoustic Report must measure the noise readings over a 15 minute period and must provide details of all modelling assumptions including source noise data, noise monitoring positions, receiver heights and locations, prevailing meteorological conditions during the monitoring, confirmation of the methodology adopted along with a copy of the model input and output data.

5.3 The maximum height for noise attenuation walls and fences along the boundary of the site is 2 m.'

5.2 NSW Department of Planning and Environment

5.2.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The NSW Department of Planning and Environment (DoPE) published the State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 on 1 March 2022. The SEPP (Transport and Infrastructure) 2021 consolidates the previous SEPP (Educational Establishments and Child Care Facilities) 2017, along with other related SEPPs.

Chapter 3 of the SEPP (Transport and Infrastructure) 2021, 'Educational establishments and child care facilities', aims to establish consistent State-wide assessment requirements and design considerations for educational establishments and early education and care facilities to improve the quality of infrastructure delivered and to minimise impacts on surrounding areas. Section 3.27 of Chapter 3 of the SEPP states the following with regard to Local Council Development Control Plans that contain specific requirements, standards or controls related to Child Care Centres:

> *'3.27: Centre-based child care facility—development control plans*
>
> *(1) A provision of a development control plan that specifies a requirement, standard or control in relation to any of the following matters (including by reference to ages, age ratios, groupings, numbers or the like, of children) does not apply to development for the purpose of a centre-based child care facility—*
>
> *(a) operational or management plans or arrangements (including hours of operation),*
>
> *(b) demonstrated need or demand for child care services,*
>
> *I proximity of facility to other early childhood education and care facilities,*
>
> *(d) any matter relating to development for the purpose of a centre-based child care facility contained in:*
>
> *(i) the design principles set out in Part 2 of the Child Care Planning Guideline, or*
>
> *(ii) the matters for consideration set out in Part 3 or the regulatory requirements set out in Part 4 of that Guideline (other than those concerning building height, side and rear setbacks or car parking rates).*
>
> *(2) This section applies regardless of when the development control plan was made."*

Based on the information provided in Section 3.27 of the SEPP, the DCP controls do not necessarily apply to the development. However, Council's DCP will be considered in the generation of Project Specific Noise Criteria for the Site.

5.2.2 NSW DoPE – Child Care Planning Guideline

The NSW DoPE published the Child Care Planning Guideline (CCPG) in August 2017 as a supplement to the SEPP (Educational Establishments and Child Care Facilities) 2017. The CCPG was then updated in September 2021.

The SEPP states that "*a consent authority must take into consideration this Guideline* (CCPG) *when assessing a development application (DA) for a centre-based child care facility.*" The SEPP also determines the Guideline "*will take precedence over a Development Control Plan (DCP), with some exceptions, where the two overlap in relation to a child care facility."*

The Guideline was introduced to *'assist industry to deliver early childhood education facilities that are of the highest standards'* and *'to align NSW planning controls with the National Quality Framework for early education and care, creating more certainty for developers and operators seeking service approval'.*

Section 3, *Matters for Consideration*, Subsection 3.5 Visual and acoustic Privacy, contains the following for consideration:

Objective: To minimise the impact of child care facilities on the acoustic privacy of neighbouring residential developments.

C22

A new development, or development that includes alterations to more than 50 percent of the existing floor area, and is located adjacent to residential accommodation should:

- *provide an acoustic fence along any boundary where the adjoining property contains a residential use. An acoustic fence is one that is a solid, gap free fence*
- *ensure that mechanical plant or equipment is screened by solid, gap free material and constructed to reduce noise levels eg acoustic fence, building or enclosure.*

C23

A suitably qualified acoustic professional should prepare an acoustic report which will cover the following matters:

- *Identify an appropriate noise level for a child care facility located in residential and other zones*
- *Determine an appropriate background noise level for outdoor play area during times they are proposed to be in use*
- *Determine the appropriate height of any acoustic fence to enable the noise criteria to be met.*

Subsection 3.6 Noise and air pollution, contains the following for consideration:

'Considerations

Objective: To ensure that outside levels on the facility are minimized to acceptable levels.

C24

Adopt design solutions to minimise the impacts of noise, such as:

- *creating physical separation between buildings and the noise source*
- *orienting the facility perpendicular to the noise source and where possible buffered by other uses*
- *using landscaping to reduce the perception of noise*
- *limiting the number and size of openings facing noise sources*
- *using double or acoustic glazing, acoustic louvres or enclosed balconies (wintergardens)*
- *using materials with mass and/or sound insulation or absorption properties, such as solid balcony balustrades, external screens and soffits*
- *locating cot rooms, sleeping areas and play areas away from external noise sources.'*

C25

An acoustic report should identify appropriate noise levels for sleeping areas and other non play areas and examine impacts and noise attenuation measures where a child care facility is proposed in any of the following locations:

- *on industrial zoned land*
- *where the ANEF contour is between 20 and 25, consistent with AS2021:2000*
- *along a railway or mass transit corridor, as defined by State Environmental Planning Policy (Infrastructure) 2007*
- *on a major road or busy road*
- *other land that is impacted by substantial external noise.*

5.3 AAAC – Guideline for Child Care Centre Acoustic Assessment

The Association of Australasian Acoustical Consultants (AAAC) published the *Guideline for Child Care Centre Acoustic Assessment* (Guideline), in September 2020 to assist both AAAC members and local Councils to assess the noise impact from proposed child care centres both accurately and fairly (see www.aaac.org.au).

Section 3 of the AAAC Guideline states the following in relation to noise generation from child care centres, while Section 5.0 states the following in relation to noise impact on children:

'3.2 Criteria - Residential Receptors

3.2.1 Outdoor Play Area

The noise impact from children at play in a child care centre differs from the domestic situation in that it is a business carried out for commercial gain, the number of children can be far greater than in a domestic situation and the age range of the children at the centre does not significantly vary over time as it would in a domestic situation. However, the noise from children is vastly different, in both character and duration, from industrial, commercial or even domestic machine noise. The sound from children at play, in some circumstances, can be pleasant, with noise emission generally only audible during the times the children play outside. Night time, weekend or public holiday activity is not typical and child care centres have considerable social and community benefit.

Base Criteria *– With the development of child care centres in residential areas, the background noise level within these areas can at certain times, be low. Thus, a base criterion of a contributed* $L_{eq,15min}$ *45 dB(A) for the assessment of outdoor play is recommended in locations where the background noise level is less than 40 dB(A).*

Background Greater Than 40 dB(A) *– The contributed* $L_{eq,15min}$ *noise level emitted from an outdoor play and internal activity areas shall not exceed the background noise level by more than 5 or 10 dB at the assessment location, depending on the usage of the outdoor play area. AAAC members regard that a total time limit of approximately 2 hours outdoor play per morning and afternoon period should allow an emergence above the background of 10 dB (ie background +10 dB if outdoor play is limited to 2 hours in the morning and 2 hours in the afternoon).*

Up to 4 hours (total) per day *– If outdoor play is limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed* $L_{eq,15min}$ *noise level emitted from the outdoor play shall not exceed the background noise level by more than 10 dB at the assessment location.*

More than 4 hours (total) per day *– If outdoor play is not limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed* $L_{eq,\ 15min}$ *noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5 dB at the assessment location.*

The assessment location is defined as the most affected point on or within any residential receiver property boundary. Examples of this location may be:

- *1.5 m above ground level;*
- *On a balcony at 1.5 m above floor level;*
- *Outside a window on the ground or higher floors.*

3.2.2 Indoor Play Area, Mechanical Plant, Pick up and Drop off

The cumulative $L_{eq,\ 15\ minute}$ noise emission level resulting from the use and operation of the child care centre, with the exception of noise emission from outdoor play discussed above, shall not exceed the background noise level by more than 5 dB at the assessment location as defined above. This includes the noise emission resulting from:

- *Indoor play;*
- *Mechanical plant;*
- *Drop off and pick up;*
- *Other activities/operations (not including outdoor play).*

3.2.3 Sleep Disturbance

The noise impact of staff arrivals, setup, cleaning or other on-site activities prior to 7 am or during night-time hours should be assessed at nearby residential premises. The L_{Amax} noise level emitted from vehicles arriving and parking, depending on the requirements of the state or territory where the centre is located shall not exceed the background noise level by more than 15 dB outside the nearest habitable room window.

3.3 Commercial Receptors

The cumulative $L_{eq,\ 15\ min}$ noise level emitted from the use and operation of the child care centre shall not exceed 65 dB(A), from all activities (including outdoor play), when assessed at the most affected point on or within any commercial property boundary.'

3.4 Other Sensitive Receptors

Where appropriate, assessment should include consideration of noise emission to other sensitive uses including schools, hospitals, places of worship and parks (active and passive). Depending on the requirements of the state or territory where the centre is located, in the absence of applicable noise criteria for such a sensitive use, the cumulative Leq,15min noise level emitted from the use and operation of the child care centre shall not exceed 65 dB(A), from all activities (including outdoor play), when assessed at the most affected point on or within the sensitive property boundary, and shall not exceed 45 dB(A) internally, with windows or doors of the sensitive receiver open.

Section 5 of the AAAC Guideline states the following in relation to external noise impacts on children within Child Care Centres:

> '***5.0 External Noise Impact on Children***
>
> *For proposals that are located within 60 metres of an arterial road, railway line, industry or within close proximity to an airport, a noise intrusion assessment should be submitted with the development application.*
>
> ***5.1 Road, Rail Traffic and Industry***
>
> *The $L_{Aeq,1hr}$ noise level from road traffic, rail or industry at any location within the outdoor play or activity area during the hours when the Centre is operating should not exceed 55 dB(A).*
>
> *The $L_{Aeq,1hr}$ noise level from road traffic, rail or industry at any location within the indoor activity or sleeping areas of the Centre during the hours when the centre is operating shall be capable (ie with doors and/or windows closed) of achieving 40 dB(A) within indoor activity areas and 35 dB(A) in sleeping areas.'*

5.4 NSW Environment Protection Authority – NSW Road Noise Policy

The NSW Road Noise Policy (RNP), in Section 2.3.1, sets out road traffic noise assessment criteria for residential land uses in Table 3. The information in that table is extracted below in Table 5.

Table 5 Road Traffic Noise Assessment Criterion - Residential

Road Category	Type of project/land use	Assessment Criteria – dB(A) Day (7 am – 10 pm)
Local roads	6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq, (1\ hour)}$ 55 (external)

5.5 Project Specific Noise Criteria

Based on the measured background noise levels and the relevant planning instruments and legislation, we have determined the Project Specific Noise Criteria at each receptor location as follows:

5.5.1 Noise Emission Criteria

5.5.1.1 Residential Receptors

For Residential Receptors 'R1', 'R2' and 'R8' – based on the measured background noise levels at Location 'A':

- (44 + 5 =) **49 dBA** $L_{eq,\ 15\ minute}$ for all day outdoor play; **or**
- (44 + 10 =) **54 dBA** $L_{eq,\ 15\ minute}$ for outdoor play of up to 4 hours (total)[2] per day;
- (44 + 5 =) **49 dBA** $L_{eq,\ 15\ minute}$ for all other noise sources including car park, mechanical plant and indoor play areas.

For Residential Receptors 'R3', 'R4', 'R5', 'R6a', 'R6b' and 'R7' – based on the measured background noise levels at Location 'B':

- **45 dBA** $L_{eq,\ 15\ minute}$ for outdoor play;
- (38 + 5 =) **43 dBA** $L_{eq,\ 15\ minute}$ for all other noise sources including car park, mechanical plant and indoor play areas.

The assessment location is defined as the most affected point on or within any residential receiver property boundary. Examples of this location may be:

- 1.5 m above ground level;
- On a balcony at 1.5 m above floor level;
- Outside a window on the ground or higher floors.

[2] *As per the AAAC Guideline, outdoor play can be limited to no more than two hours in the morning and two hours in the afternoon, to apply a background + 10 dB criterion.*

5.5.1.2 Sleep Disturbance

Consideration has been given to sleep disturbance caused by noise generated from staff arriving prior to 7 am, and parking within the basement level car park.

The following criteria is applied at the residential receptors closest to the designated staff parking spaces in the basement level car park, 'R1' and 'R2', during the early morning period of 6.30 am to 7 am. Compliance at the most affected receptors will ensure compliance at all other potentially affected receptor locations:

For residential facades 'R1' and 'R2'– based on the measured background noise levels at Location 'A':

- (48 + 15 =) **63 dBA** L_{Amax} at the closest affected habitable room window of the residential premises between 6.30 am and 7 am.

5.5.1.3 On-Road Traffic Noise Criterion

The following criterion will be applied at 1 metre from the most affected residential façades 'R1' and 'R2', for on – road traffic noise. Compliance at the most affected receptors will ensure compliance at all other potentially affected receptor locations further away from Weston Street:

- **55 dBA** (external) $L_{Aeq,\ 1\ hour}$ between 7 am and 6 pm.

5.5.2 Noise Intrusion Criteria

Road Traffic Noise Intrusion - in accordance with the AAAC Guideline:

- Internal traffic levels within sleeping areas (Cot Rooms) of the Centre should not exceed $L_{Aeq,\ 1\ hour}$ 35 dBA during operating hours.
- Internal traffic noise levels within indoor activity areas of the Centre should not exceed $L_{Aeq,\ 1\ hour}$ 40 dBA during operating hours.
- External traffic noise levels in any outdoor play or activity area of the Centre should not exceed $L_{Aeq,\ 1\ hour}$ 55 dBA during operating hours.

6.0 CHILD CARE CENTRE NOISE EMISSION

The main sources of noise from the Centre will be as follows:

- Children playing both outside and inside;
- Cars entering and exiting the car park; and
- Mechanical plant serving the Centre.

Noise modelling is based on the architectural drawings prepared by Design-Basix-Build attached as Appendix C.

6.1 Indoor and Outdoor Play Areas

The AAAC has presented a range of A-weighted sound power levels per child in Table 1 of its *'Guideline for Child Care Centre Acoustic Assessment'.* The sound power levels of each group are presented in Table 6 and have been adopted to assess noise emissions from children in this assessment.

Table 6 L_{eq} Sound Power Levels - Children Engaging in Active Play

Number and Age of Children	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
10 children, 0 to 2 years	**78**	54	60	66	72	74	71	67	64
10 children, 2 to 3 years	**85**	61	67	73	79	81	78	74	70
10 children, 3 to 5 years	**87**	64	70	75	81	83	80	76	72

In the notes to Table 1 of the AAAC's *Guideline*, where passive/quiet activities are engaged in by children, the noise generated by children is generally 6 dB lower than active play.

6.2 Vehicles (Car Park & Driveway) Noise Emission

Based on the RTA's 'Guide to Traffic Generating Developments' prediction of 0.8 morning peak (7 am - 9 am), 0.3 early afternoon peak (2.30 pm - 4 pm) and 0.7 afternoon peak (4 pm - 6 pm) vehicle trips per child for Child Care Centres (Long-day care), we have assumed, as a worst-case scenario, a flow of cars equivalent to 29 cars in 1 hour arriving or leaving the Centre during any given day. This traffic flow rate has been used in the assessment of noise generated by on-road traffic.

A flow rate of 29 cars in 1 hour is equivalent to a rate of 7 vehicle trips in a 15-minute period arrive or departing from the Site. This rate has been used in the assessment of vehicular noise associated with the car park area.

For the assessment of vehicular activity associated with the car park area, we have assumed vehicles will travel at a speed of 10 km/h on the site. For noise generated by on-road traffic, we have assumed vehicles will travel at a speed of 50 km/h as they approach or leave the site.

We have assumed 50% of vehicles will arrive or leave the Site from the east along Weston Street, with the remaining 50% of vehicles arriving or leaving the Site from the west via Weston Street.

The Sound Exposure Level[3] (SEL) and $L_{AF,\,max}$ sound power level and spectra of vehicle noise is shown below in Table 7 and is based on previous measurements by Day Design.

Table 7 SEL & L_{Amax} Sound Power Levels – Car Park Noise

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
SEL of car drive by at approximately 10 km/h	**88**	92	88	84	83	84	79	76	70
SEL of car driving uphill at approximately 10 km/h	**88**	96	94	86	85	83	79	76	70
SEL of car driving downhill at approximately 10 km/h	**85**	91	89	83	81	81	77	75	68
SEL of car drive-by at approximately 50 km/h	**97**	99	97	94	93	95	87	77	70
L_{Amax} of car entering car park	**92**	98	92	90	88	88	83	80	76

[3] *SEL is the total sound energy of a single noise event condensed into a one second duration.*

6.3 Mechanical Plant

The mechanical plant, including air conditioning condensers, kitchen and bathroom exhaust fans, lift motor and car park exhaust fan have not been selected at this stage. Therefore, a preliminary noise assessment will be based on typical units for the size of the development, with sound power levels from typical units being used.

Two air conditioning condensers are assumed to be located on the western side of the building at ground floor level, adjacent to the fire stair. The lift motor for the development is assumed to be located within a pit at the bottom of the proposed lift shaft.

We have assumed that the kitchen and toilet exhaust fans will be ducted through the façades of the development. The car park exhaust fan is assumed to be ducted to the roof of the development through a dedicated riser adjacent to the stairwell. The bin store exhaust fan is also assumed to be ducted to the roof of the development through this same riser.

The assumed locations of these items of mechanical plant can be seen within the marked up architectural drawings attached as Appendix D. Sound power levels used in the calculation of the noise contribution from the mechanical plant are shown in Table 8.

Table 8 $L_{eq,\ 15\ minute}$ Sound Power Levels – Mechanical Plant

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Car park exhaust fan[4]	**75**	73	72	70	76	70	64	54	46
Small kitchen exhaust fan[5]	**60**	61	67	62	54	54	50	45	39
Small exhaust fan (toilet)[6]	**60**	51	47	50	53	59	43	36	31
Hydraulic lift motor[7]	**63**	59	61	55	59	58	56	52	48
Exhaust air fan[8]	**69**	67	69	63	66	63	63	57	52
Medium (double fan) outdoor condenser unit[9]	**69**	55	55	61	67	64	62	59	45

We recommend a detailed analysis be carried out once the mechanical plant is selected and locations are finalised, prior to the issue of a Construction Certificate.

[4] *Spectral sound power level based on Fantech RDE10010DP6/10 – Downflow Discharge Axial Fan.*
[5] *Spectral sound power level based on Fantech CPD01254FSC.*
[6] *Spectral sound power level based on Fantech TD-500/150 SIL.*
[7] *Spectral sound power level based on a residential lift system previously measured by Day Design.*
[8] *Spectral sound power level based on Fantech RVLE0568KP6/10*
[9] *Spectral sound power level based on Daikin RZQ140LV1 outdoor condenser unit.*

6.4 Predicted Noise Levels

Knowing the sound power level of a noise source (See Table 6 to Table 8), the sound pressure level (as measured with a sound level meter) can be calculated at a remote location using suitable formulae to account for distance losses, sound barriers, etc.

Where applicable, calculations include reductions for the acoustic screening provided by fences and the proposed Centre itself. Based upon the architectural drawings attached as Appendix C, the following solid boundary heights are assumed for the Centre:

- 1.8-metre-high fence above natural ground along the eastern and western boundaries of the Site, from the northern façade to the southern boundary;
- 1.8-metre-high fence above natural ground along the southern boundary of the Site;
- 1.8-metre-high balustrade around the perimeter of the Level 1 0-2 Year Old outdoor play area;
- No solid fence along the northern boundary of the Site.

Noise emission calculations also include reductions provided by the following time period correction, where relevant:

- Time period correction of (*10 x log [1/900] =*) – 29.5 dB for SEL noise levels associated with the use of car parks in a 15 minute period - $L_{eq,\ 15\ minute}$ calculations only; and
- Time period correction of (*10 x log [1/3600] =*) – 35.6 dB for SEL noise levels associated with the use of car parks in a 1 hour period - $L_{eq,\ 1\ hour}$ calculations only.

Calculations of noise emission from the indoor play area include reductions for operable glazing in the façade. For the purposes of our calculations, we have assumed all operable glazing to be of a standard construction (5 mm glass) and to be open (50% of the window area).

All noise modelling calculations for noise generating components of the Centre were performed within DGMR iNoise 2024 noise modelling software using noise propagation equations of ISO 9613-1 – '*Acoustics – Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere'*, and ISO 9613-1 – '*Acoustics – Attenuation of sound during propagation outdoors. Part 2: Attenuation of sound during propagation outdoors. Part 2: General method of calculation*'.

As a worst-case scenario, noise emission has been modelled with all children engaged in simultaneous outdoor play, as discussed in Section 6.4.1. Noise levels are calculated to all receptor locations outlined in Table 1.

Table 9 and Table 10 show the predicted noise levels at the residential receptors from the activities discussed previously, during the early morning and day periods.

6.4.1 Outdoor Play Area Noise Levels

Based upon a review of World Health Organization (WHO) data for average children heights, the notes to Table 1 of the *AAAC's Guideline* recommends a source height of 1.0 metre above ground level for all children.

The approximate locations of the noise sources (children) used for the assessment of the outdoor play area are shown in the attached Appendix D. All noise sources in each outdoor play area shown in Appendix D are assessed as being outside at the same time to achieve the overall worst case predicted noise levels at each of the receiver locations.

The $L_{eq,\ 15\ minute}$ noise levels at all receptor locations for children engaged in outdoor play are calculated to be as shown in Table 9.

Table 9 Predicted $L_{eq,\ 15\ minute}$ Noise Levels – Outdoor Play

Receptor Location – Ground Floor (GF), First Floor (FF)	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R1 – 167 Weston Street (GF)	53	49	**No (+4 dB)**
R2 – 165 Weston Street (GF)	36	49	Yes
R3 – 33 Panorama Parade (GF)	49	45	**No (+4 dB)**
R4 – 31 Panorama Parade (FF)	44	45	Yes
R5 – 7 Hinemoa Street (GF)	47	45	**No (+2 dB)**
R6a – 5 Hinemoa Street (GF)	54	45	**No (+9 dB)**
R6b – 5 Hinemoa Street (FF)	51	45	**No (+6 dB)**
R7 – 3 Hinemoa Street (GF)	51	45	**No (+6 dB)**
R8 – 1 Hinemoa Street (GF)	42	49	Yes

As summarised in Table 9, the predicted levels of noise will comply with the criteria established in Section 5.5 of this report for receptors 'R2', 'R4' and 'R8', but will exceed the criteria at receptors 'R1', 'R3', 'R5', 'R6a', 'R6b', 'R7'. As such, noise controls will be required, as recommended in Section 8.0.

6.4.2 Cumulative Noise Level - Indoor Play Area, Car Park and Mechanical Plant

The predicted worst case cumulative $L_{eq,\ 15minute}$ noise levels at all receptor locations are calculated to be as shown in Table 10.

Table 10 Predicted Cumulative $L_{eq,\ 15\ minute}$ Noise Levels – Indoor Play, Mechanical Plant & Car Park

Receptor Location and Description	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R1 – 167 Weston Street (GF)			
- Indoor play areas	52		
- Car park	37		
- Mechanical	40		
Cumulative Noise Level	52	49	**No (+3 dB)**
R2 – 165 Weston Street (GF)			
- Indoor play areas	33		
- Car park	<20		
- Mechanical	33		
Cumulative Noise Level	36	49	Yes
R3 – 33 Panorama Parade (GF)			
- Indoor play area	37		
- Car park	<20		
- Mechanical	42		
Cumulative Noise Level	43	43	Yes
R4 – 31 Panorama Parade (FF)			
- Indoor play area	42		
- Car park	20		
- Mechanical	35		
Cumulative Noise Level	42	43	Yes
R5 – 7 Hinemoa Street (GF)			
- Indoor play area	36		
- Car park	<20		
- Mechanical	41		
Cumulative Noise Level	42	43	Yes

Table 10 Predicted Cumulative $L_{eq,\ 15\ minute}$ Noise Levels – Indoor Play, Mechanical Plant & Car Park – Continued

Receptor Location and Description	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R6a – 5 Hinemoa Street (GF)			
- Indoor play areas	38		
- Car park	<20		
- Mechanical	43		
Cumulative Noise Level	44	43	**No (+1 dB)**
R6b – 5 Hinemoa Street (FF)			
- Indoor play areas	42		
- Car park	<20		
- Mechanical	42		
Cumulative Noise Level	45	43	**No (+2 dB)**
R7 – 3 Hinemoa Street (GF)			
- Indoor play areas	29		
- Car park	<20		
- Mechanical	43		
Cumulative Noise Level	43	43	Yes
R8 – 1 Hinemoa Street (GF)			
- Indoor play areas	35		
- Car park	<20		
- Mechanical	41		
Cumulative Noise Level	42	49	Yes

As summarised in Table 10, the predicted levels of noise at the nearby receptors will comply with the criteria established in Section 5.5 of this report for receptor locations ‘R2’, ‘R3’, ‘R4’, ‘R5’, ‘R7’ and ‘R8’, but exceed the criteria at receptor locations ‘R1’, ‘R6a’ and ‘R6b’. As such, noise controls will be required, as recommended in Section 8.0.

6.4.3 Sleep Disturbance

It is proposed that the Centre will accept children from 7 am. Two staff members are assumed to arrive prior to 7 am, to prepare for the arrival of the children, with more staff and parents arriving after 7 am. In order to assess the potential for sleep disturbance from staff vehicle activity, we have assumed that two staff vehicles will arrive between 6.30 am and 7 am.

As shown in the architectural drawings, the staff parking spaces are located on the north side of the car park. As such, we have assumed that the staff vehicles will park in the closest staff spaces to the lift.

The calculated L_{AFmax} noise levels at the nearest affected residential receptor locations to the car park are shown in Table 11 below.

Table 11 Predicted $L_{AF,\,max}$ Noise Levels – Sleep Disturbance

Receptor Location and Description	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R1 – 167 Weston Street (GF)			
- Car Pulling into Driveway	49	63	Yes
R2 – 165 Weston Street (GF)			
- Car Pulling into Driveway	41	63	Yes

As seen in Table 11, the predicted level of noise emission from staff arriving prior to 7 am will comply with the sleep disturbance criteria established in Section 5.5 at receptor locations 'R1', and 'R2', and is therefore considered acceptable.

6.4.4 On-Road Traffic

The external $L_{eq,\,1\,hour}$ noise levels at the most affected residential receiver locations 'R1' and 'R2' from noise associated with on–road traffic along Weston Street throughout the day are calculated to be as shown below in Table 12.

Table 12 Predicted $L_{eq,\,1\,hour}$ Noise Levels – On – Road Traffic

Receiver Location	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R1 – 167 Weston Street (GF)	48	55	Yes
R2 – 165 Weston Street (GF)	50	55	Yes

The predicted external noise levels from on-road traffic are within the noise criteria in Section 5.0 and are therefore acceptable.

Considering the above, the road traffic noise associated with the development is considered acceptable.

7.0 NOISE INTRUSION – ROAD TRAFFIC NOISE

7.1 External Road Traffic Noise Levels – Outdoor Play Areas

Based on the long-term measurements at Location 'A' and Location 'B', and the calculation method shown in Appendix B, Section B3 of the NSW Road Noise Policy for the 'overall $L_{Aeq, (1\ hour)}$', the calculated equivalent $L_{Aeq, 1\ hour\ (traffic)}$ level is shown below in Table 13.

Table 13 Predicted $L_{eq, 1\ hour}$ Noise Levels – Noise within Outdoor Play Areas

Outdoor Location	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
Outdoor Play Area – Ground Floor	52	55	Yes
Outdoor Play Area – First Floor	54	55	Yes

7.2 Road Traffic Noise Intrusion Assessment – Indoor Playrooms

The internal $L_{eq, 1\ hour}$ road traffic noise level within the indoor play rooms has been calculated to be as shown in Table 14. The indoor play rooms are subject to noise from Weston Street. Calculations assumed that standard construction has been used throughout and the recommended glazing thicknesses (as detailed in Section 6.4) have been used for windows and glazed doors. As the Cot Room does not have any external windows, road traffic noise levels have not been calculated to this room.

Generally, the noise level reduction through an open window from outside to inside is recognised as being 10 dB.

Table 14 Calculated $L_{eq, 1\ hour}$ Road Traffic Noise Levels –Indoor Play Rooms

Receptor Location	Calculated Noise Level $L_{eq, 1\ hour}$ (dBA)		Noise Criteria (dBA)	Compliance (Yes/No)
Windows & Doors	***Open***	***Closed***		
2-5 Year Old Indoor Play Room	50	40	40	**No**/Yes
0-2 Year Old Indoor Play Room	54	44	40	**No/No**

It can be seen that the calculated internal levels of road traffic noise within the 2-5 year old indoor play room is capable of achieving the noise criteria established in Section 5.5 with the external windows and doors closed when the Centre is operating, however the 0-2 year old indoor play room will require further noise controls, as recommended in Section 8.1.2.

8.0 NOISE CONTROL RECOMMENDATIONS

8.1 Noise Management Plan

We recommend the Centre's management implement a Noise Management Plan that should include, but not be limited to, the following:

8.1.1 General Noise Management Strategies

- Ensuring all staff and parents are provided with a copy of the Centre's Noise Management Plan and its implications for them during their time at the Centre.
- The name and contact details of the Centre's Manager should be clearly displayed at the front of the building to ensure neighbours can contact that person at any time the Centre is operating.
- Ensuring a sufficient number of educators are provided to supervise children's outside play to discourage unnecessarily loud activities.
- Carers/staff should be educated to control the level of their voice while outdoors.
- Facilitating children's small group play when outside, and encouraging educators to engage in children's play and facilitate friendships between children.
- Crying children should be comforted as quickly as possible and moved indoors.
- Staff arriving prior to 7 am and parking in the 'Staff' area should ensure they do not create unnecessary noise.
- Any maintenance proposed on the Site should take place during day time hours only, i.e. 7 am to 6 pm.
- While cleaners are on the Site they should be instructed to not make an unreasonable level of noise. Normal conversations would be acceptable, however shouting would not.
- While staff meetings are taking place on the Site, staff should be instructed to not make an unreasonable level of noise. Normal conversations would be acceptable, however shouting would not.
- Waste collection services should be scheduled during the day time only to minimise potential for sleep disturbance.
- Elevated play structures over 300 mm above the finished floor level should be avoided.

8.1.2 Indoor Activity Area Window/Door Closure

- Windows in the northern façade of the 2-5 year old indoor play room should remain closed when the room is in use, to limit the level of traffic noise intrusion into this space.
- Windows in the southern façade of the 2-5 year old indoor play room should remain closed when the room is in use, to limit the level of noise emission to nearby residences.
- Windows and doors in the northern and eastern façades of the first floor 0-2 year old indoor play room should be constructed from 6.38 mm laminated glass (minimum R_w 32), and remain closed when the room is in use, to limit the level of traffic noise intrusion into this space.

As these windows are required to be closed, alternative ventilation may need to be provided. Rooms are to be ventilated to the standards set out in clause F6D6 of the Building Code of Australia and Australian Standard AS1668.2. An air conditioning system with fresh air supply, or a silenced air intake duct (detailed in dataset AC810-6B) will satisfy this requirement.

8.1.3 Permissible Outdoor Play Scenarios

We recommend that outdoor play is scheduled such that the 0-2 and 2-3 year old children play at a separate time to the 3-5 year old children. This results in the following acceptable groupings for outdoor play:

- **Group 1:** 10 x 0-2 year old children (FF) and 14 x 2-3 year old children (GF).
- **Group 2:** 12 x 3-5 year old children (GF).

Staff to child ratios shall be maintained in accordance with the requirements stipulated in the National Quality Framework (NQF).

8.2 Sound Barrier Fences

The proposed sound barrier walls specified within this report may be constructed from 3 rail 'solid capped and lapped' timber, 10 mm thick solid polycarbonate (not hollow), 6.38 mm thick laminated glass or masonry. The construction shall be free of visible air gaps to provide an impervious sound barrier.

If required, where an existing boundary fence is to be maintained (and is of sound construction), and to achieve the required vertical heights recommended in the following sections, a new upper portion of fence should be constructed on top of the existing fence. A transparent material such as 10 mm thick UV resistant solid polycarbonate (not hollow) may be used, cantilevered inwards at 45 degrees, as shown in Appendix E1. The construction shall be free of visible air gaps to provide an impervious sound barrier.

Alternatively, steel posts may be placed 0.5 to 1 metre stepped in from the existing fences and have 10 mm thick polycarbonate sheeting installed vertically on the outside of the steel posts and then angled inwards to the required vertical height. The vertical section is required to start a minimum of 0.5 or 1 metre (relative to distance from the boundary fence) below the maximum height of the existing fence line, as shown in Appendix E2.

We recommend the following barrier heights and locations:

8.2.1 Outdoor Play Areas –Sound Barrier Walls

- 2.1 metre high fence along the eastern boundary of the GF OPA;
- 2.7 metre high fence along the southern boundary of the GF OPA;
- 2.7 metre high fence along the western boundary of the GF OPA;
- 1.8 metre high fence around the perimeter of the FF OPA.

8.2.2 Site Boundary Fences

- 2.1-metre-high fence above natural ground along the eastern boundary of the Site, from the northern façade to the southern boundary;
- 1.8-metre-high fence above natural ground along the western boundary of the Site, from the northern façade to the southern boundary; and
- 1.8-metre-high fence above natural ground along the southern boundary of the Site.

8.3 Mechanical Plant & Equipment – Construction Certificate

The specifications for the mechanical plant have not yet been selected for this development. For typical mechanical plant and equipment with sound power levels not exceeding those listed in Table 8, it is reasonable and feasible to acoustically treat the associated plant area (absorptive lining, etc) or equipment itself so that noise will not impact the neighbouring properties.

Once mechanical plant has been selected, a detailed acoustic assessment should be made, prior to the issue of a Construction Certificate. We recommend that the mechanical services engineers select mechanical plant equipment with the lowest sound power levels to reduce the amount of acoustic treatment necessary to achieve the noise criteria at nearby residential receivers.

The cumulative noise emissions from the mechanical plant system, and use of the indoor play areas and car park is not to exceed the Project Specific Noise Criteria specified in Section 5.5.

We offer to provide detailed noise controls when specifications of the mechanical plant equipment have been finalised.

Rooms are to be ventilated to the standards set out in clause F6D6 of the 2022 Building Code of Australia and Australian Standards AS1668.2.

8.4 Construction Disclaimer

Recommendations made in this report are intended to resolve acoustical problems only. We make no claims of expertise in other areas of building construction and therefore the recommended noise controls should be implemented into the building design in consultation with other specialists to ensure they meet the structural, fire, thermal or other aspects of building construction.

We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

The integrity of acoustic structures is very dependent on installation techniques. Therefore, the use of contractors that are experienced in acoustic construction is encouraged.

9.0 PREDICTED NOISE LEVELS – AFTER NOISE CONTROLS

9.1 Outdoor Play Area

Once the noise control recommendations in Section 8.0 are incorporated into the operation of the Centre, the noise emission from the outdoor play area will be as shown in Table 15 for the groups outlined in Section 8.1.3.

Table 15 Predicted $L_{eq,\ 15\ minute}$ Noise Levels – Outdoor Play – After Noise Controls

Receptor Location – Ground Floor (GF), First Floor (FF)	Predicted Noise Level (dBA)		Noise Criterion (dBA)	Compliance (Yes/No)
	Group 1	*Group 2*		
R1 – 167 Weston Street (GF)	47	46	49	Yes
R2 – 165 Weston Street (GF)	32	33	49	Yes
R3 – 33 Panorama Parade (GF)	44	43	45	Yes
R4 – 31 Panorama Parade (FF)	40	41	45	Yes
R5 – 7 Hinemoa Street (GF)	39	40	45	Yes
R6a – 5 Hinemoa Street (GF)	45	45	45	Yes
R6b – 5 Hinemoa Street (FF)	43	45	45	Yes
R7 – 3 Hinemoa Street (GF)	43	42	45	Yes
R8 – 1 Hinemoa Street (GF)	36	36	49	Yes

9.2 Indoor Play Area

Once the noise control recommendations in Section 8.0 are incorporated into the operation of the Centre, the calculated cumulative sound pressure level from indoor play, car park and mechanical plant at the nearby residential receptors will be as shown in Table 16.

Table 16 Predicted Cumulative $L_{eq,\ 15\ minute}$ Noise Levels – Indoor Play, Mechanical Plant & Car Park

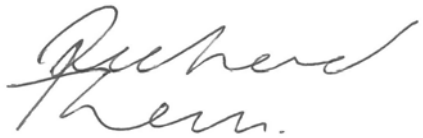
Receptor Location and Description	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance (Yes/No)
R1 – 167 Weston Street (GF)			
- Indoor play areas	31		
- Car park	37		
- Mechanical	40		
Cumulative Noise Level	42	49	Yes
R6a – 5 Hinemoa Street (GF)			
- Indoor play areas	<20		
- Car park	<20		
- Mechanical	43		
Cumulative Noise Level	43	43	Yes
R6b – 5 Hinemoa Street (FF)			
- Indoor play areas	22		
- Car park	<20		
- Mechanical	42		
Cumulative Noise Level	42	43	Yes

10.0 CONCLUSION

Day Design Pty Ltd was engaged by Design-Basix-Build to assess the potential environmental noise impact from a proposed Child Care Centre to be constructed at 169 Weston Street, Panania, NSW.

Calculations show that, provided the noise control recommendations made in Section 8.0 of this report are implemented, the intrusive noise levels will meet the noise level requirements of the NSW Department of Planning and Environment's *Child Care Planning Guideline* and the Association of Australasian Acoustical Consultants' *Guideline for Child Care Centres Acoustic Assessment*, and be considered acceptable.

Calculations also show that, provided the noise control recommendations made in Section 8.0 of this report are implemented, the level of noise emitted by the proposed Child Care Centre at 169 Weston Street, Panania, NSW, will meet the acceptable noise level requirements of the Association of Australasian Acoustical Consultants' *Guideline for Child Care Centres Acoustic Assessmen*t and the Environmental Protection Authority's *NSW Road Noise Policy,* as detailed in Section 5.5 of this report, and is considered acceptable.



Ricky Thom, BA, BE(Mech)Hons, MEnvScMgt, MIEAust
Acoustical Engineer
for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

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

APPENDICES

Appendix A – Instrumentation
Appendix B – Ambient Noise Survey
Appendix C – Architectural Drawings dated June 2025
Appendix D – Approximate Noise Source Locations and Noise Control Recommendations Mark-up
Appendix E – Sound Barrier Wall Boundary Treatment
AC108-1 to 4 – Glossary of Acoustical Terms

NOISE SURVEY INSTRUMENTATION

Noise level measurements and analysis in this report were made with instrumentation as follows:

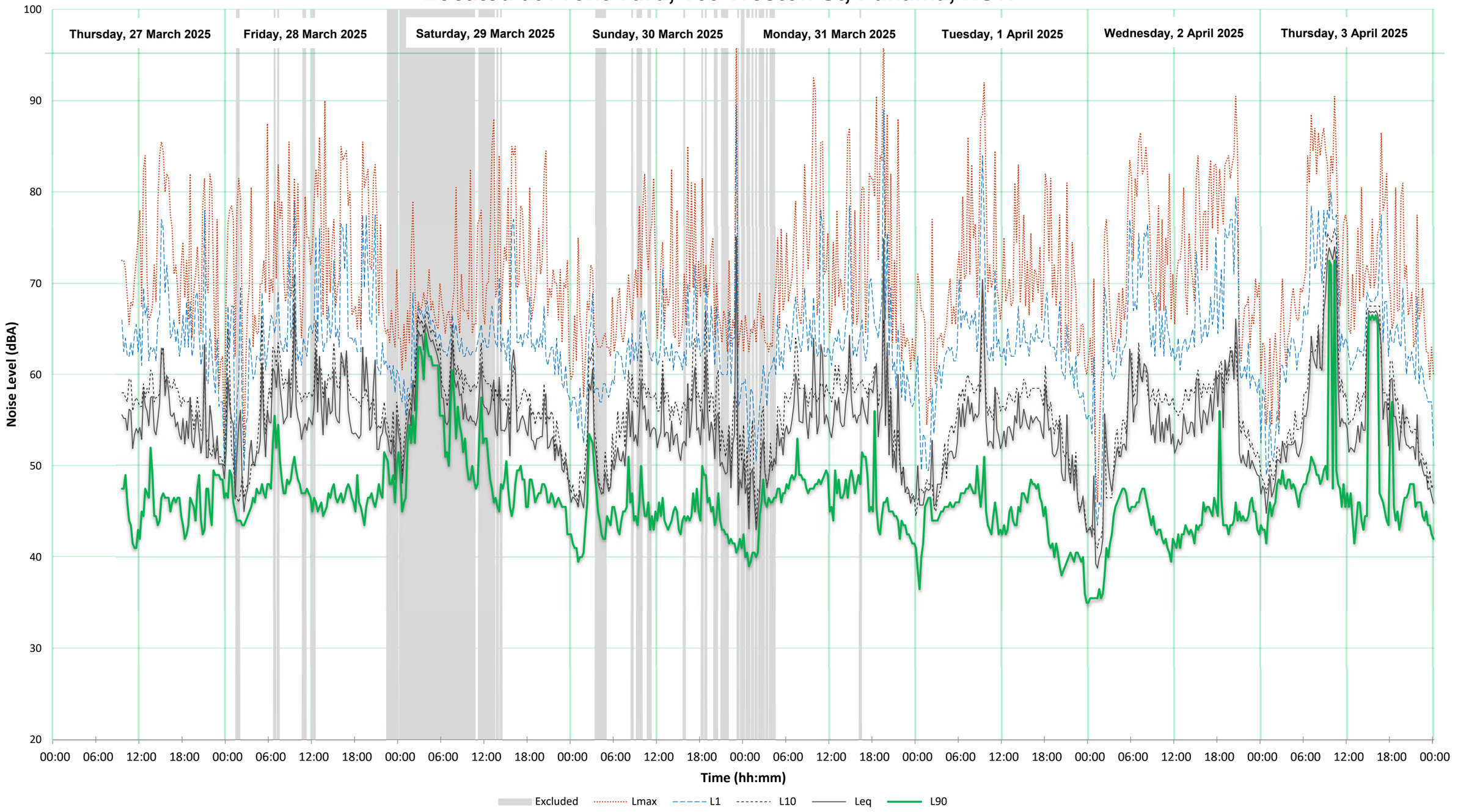
Table A1 Noise Survey Instrumentation

Description	Model No	Serial No
Infobyte Noise Logger (Type 2) Condenser Microphone 0.5" diameter	iM4 MK 250	106 106
Infobyte Noise Logger (Type 2) Condenser Microphone 0.5" diameter	iM4 MK 250	123 123
Acoustical Calibrator	B&K 4231	2095415

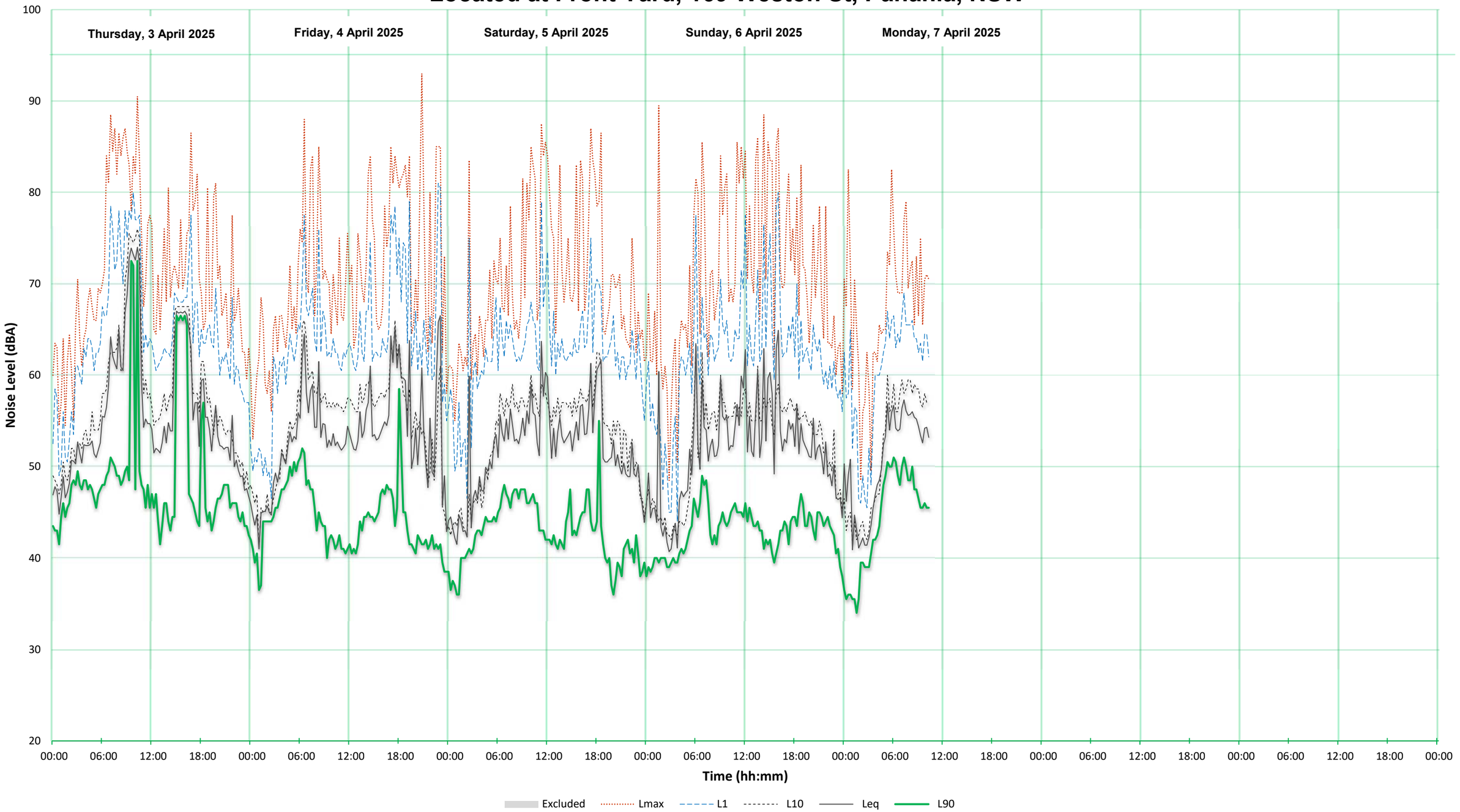
An environmental noise logger is used to continuously monitor ambient noise levels and provide information on the statistical distribution of noise during an extended period of time. The Infobyte Noise Monitor is a Type 2 precision environmental noise monitors meeting all the applicable requirements of AS1259 for an integrating-averaging sound level meter.

All instrument systems had been laboratory calibrated using instrumentation traceable to Australian National Standards and certified within the last two years thus conforming to Australian Standards. The measurement system was also field calibrated prior to and after noise surveys. Calibration drift was found to be less than 1 dB during unattended measurements. No adjustments for instrument drift during the measurement period were warranted.

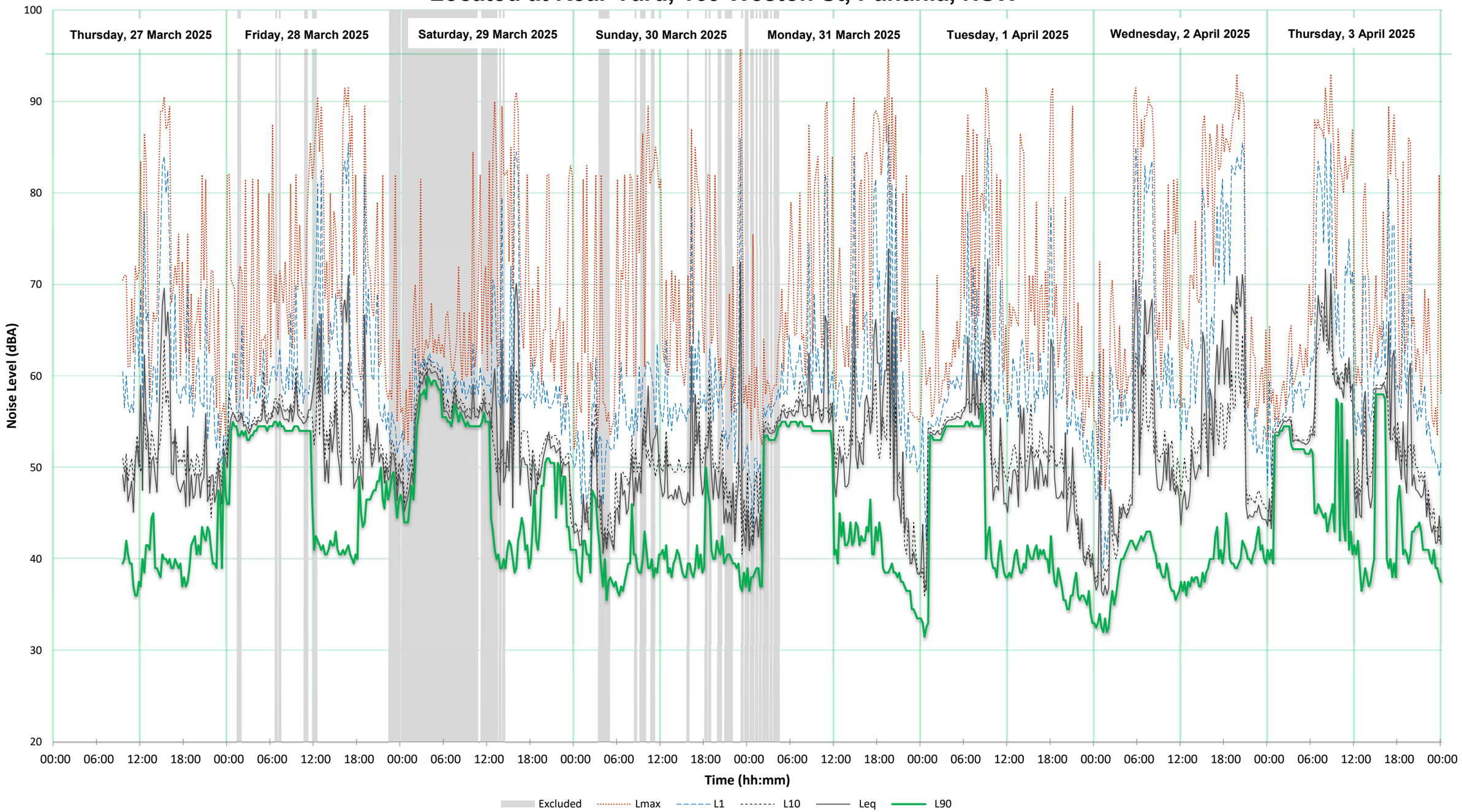
Located at Front Yard, 169 Weston St, Panania, NSW



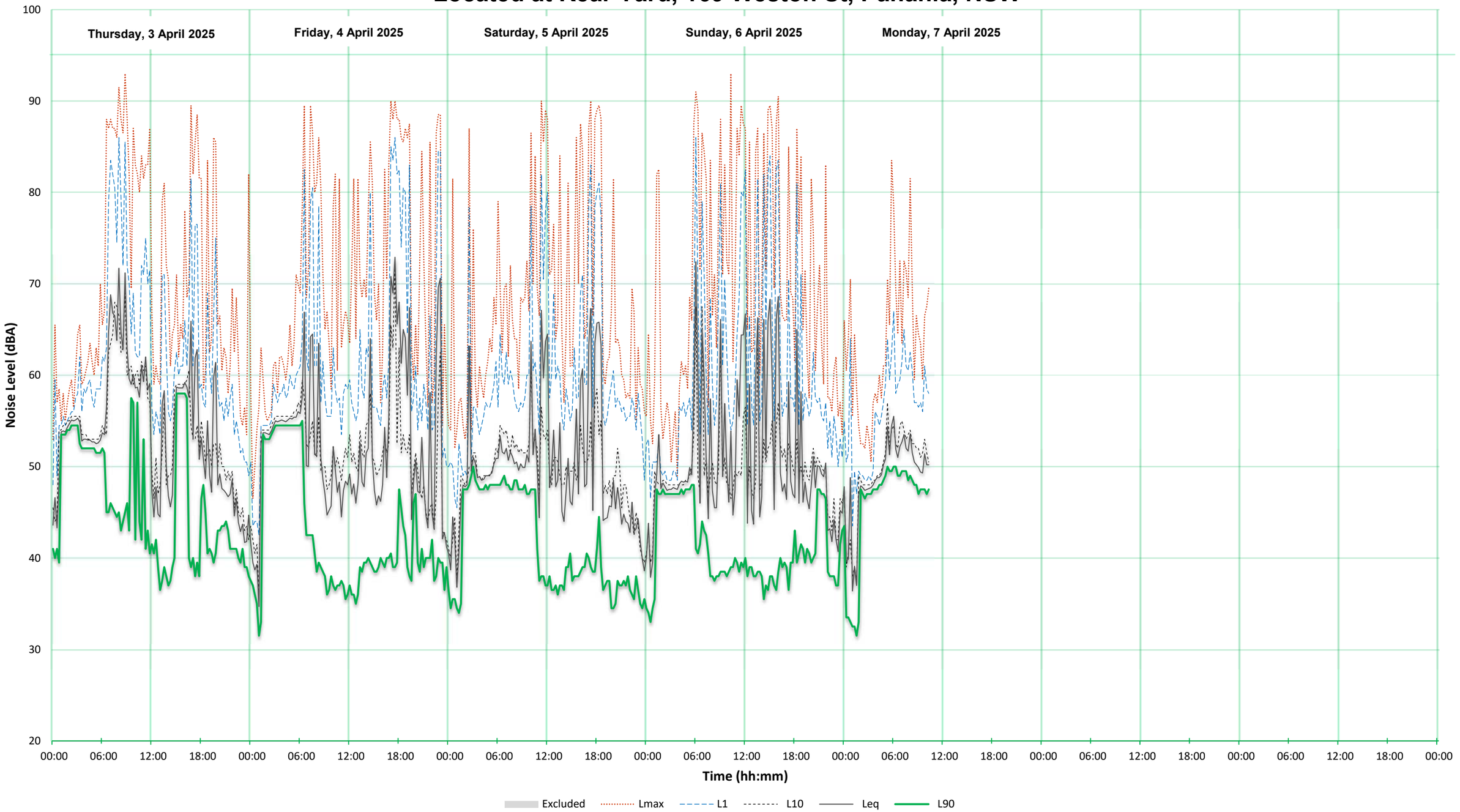
Located at Front Yard, 169 Weston St, Panania, NSW

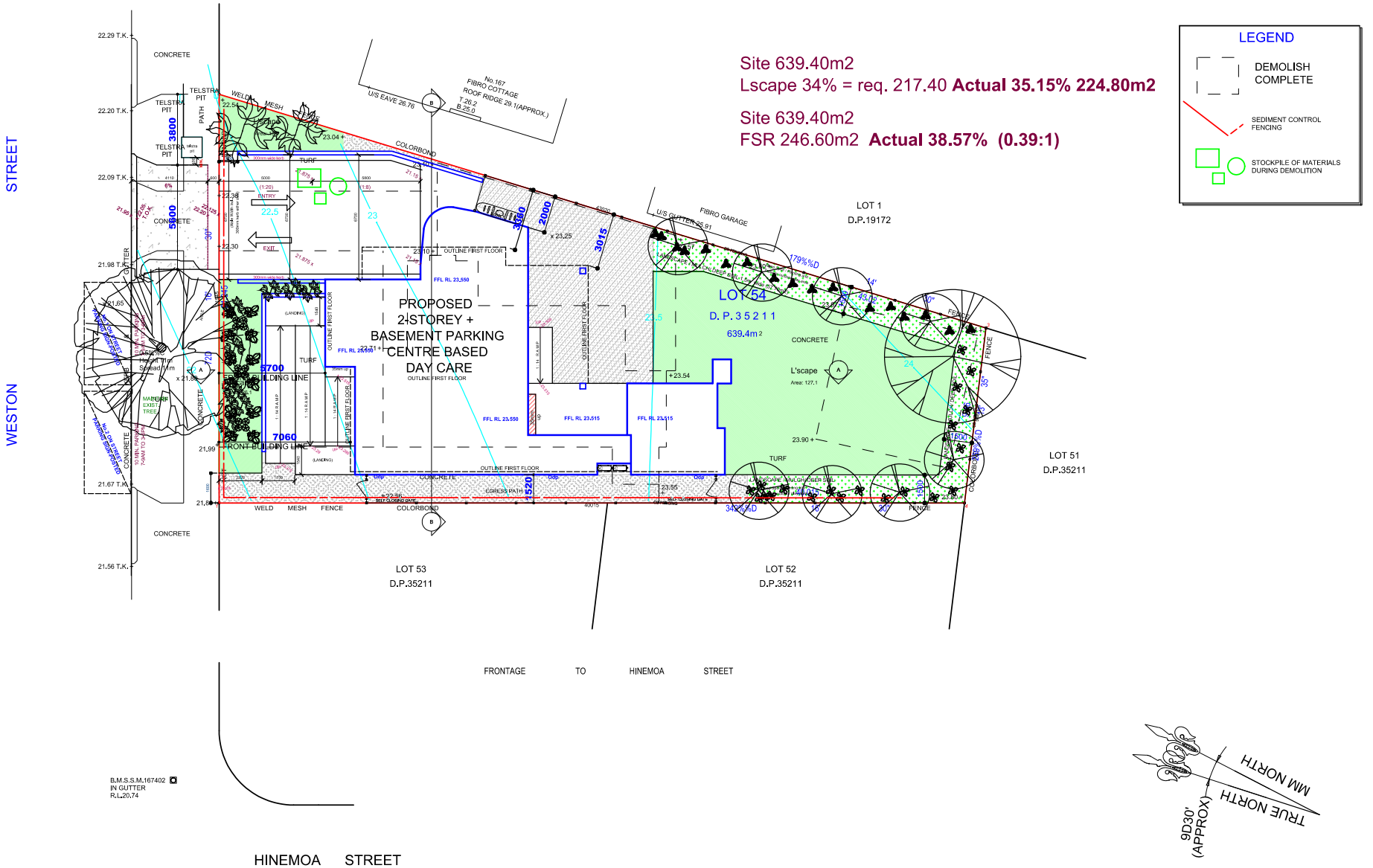


Located at Rear Yard, 169 Weston St, Panania, NSW



Located at Rear Yard, 169 Weston St, Panania, NSW





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bdaa ACCREDITED BUILDING DESIGNER
experienced & practising designer & builder Since 1997

Client :
SMJ Constructions P/L

Project Title :
Centre Base Childcare at:
L54, 169 Weston Street, Panania

Not FOR CONSTRUCTION

No.	Date	Revision
E		
D	--/06/25	DA SUBMISSION
C	29/05/25	Consultants Issue
B	20/05/25	Consultants Issue
A	03/11/24	Concept Designs

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PROPOSED SITE PLAN

Scale:	Drawn By:	Drawing No.
1:200	dbb	02
Date:	Issue:	
03/11/24	DA-C	

Symbol	Floor Plan Legend
⊕	Proposed Ground/ Floor Level
CSD	Cavity Sliding Door
CT	Ceramic Tiling
DP	Downpipe
DR	Drain
FW	Floor Waste
GA	Gas Point
LOH	Lift Of Hinges
RT	Selected Roof Tiles
SF	Selected Flooring
STC	Steel Troweled Concrete
TFT	Terra-Cotta FloorTiles
PTF	Polished Timber Flooring
SA	Smoke Alarms AS3786-2014

NOTE:

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* ALL STEEL BEAMS & TIMBER BEAMS TO BE IN ACCORDANCE WITH ENGINEERS DETAILS.
* ALL ARTICULATION JOINTS TO BE IN ACCORDANCE WITH ENGINEERS DETAILS

Health and amenity: -

- Wet areas - Part 3.8.1 of the NCC (Volume 2) and AS 3740 (2004) Waterproofing of wet areas in residential buildings
- Kitchen, sanitary and washing facilities - Parts 3.8.3.2 and 3.8.3.3 of NCC 2019 (Volume 2)
- Natural and artificial light - Parts 3.8.4 of NCC 2019 (Volume 2)
- Mechanical Ventilation to exterior **LAUNDRY, POWDER Rm, KITCHEN, BATHROOM and ENSUITE** Part 3.8.5 of NCC 2019 (Volume 2)

The minimum number of educators required to educate and care for children at a centre-based service is to be calculated in accordance with the following ratios for children:

from birth to 24 months of age—1 educator to 4 children;
over 24 months and less than 36 months of age—1 educator to 5 children;
aged 36 months of age or over (not including children over preschool age) —1 educator to 10 children (in NSW);
over preschool age, 1 educator to 15 children.

Within 400 metres of a railway or Metro station within Greater Sydney:
• 1 space per 10 children (we required 4 Spaces for Drop-off)
basement has 4 spaces + 2 on street for Drop-off
• 1 space per 2 staff. Staff parking may be (we require 7 staff / 2 = 4 (Parking)

NO. OF CHILDREN
0-2 years: 10 (ten) Children 3 Staff
2-3 years: 14(fourteen) Children 3 staff
3-5 years: 12(twelve) Children 2 staff
TOTAL 36 CHILDREN

ON SITE PARKING BASEMENT
4 Parking 4 Spaces for Staff
3 Drop Off Spaces for Parents
ON STREET PARKING
2 Spaces

ON STREET PARKING
2 No for drop-off at Designated Times

10 carspaces Total Proposed

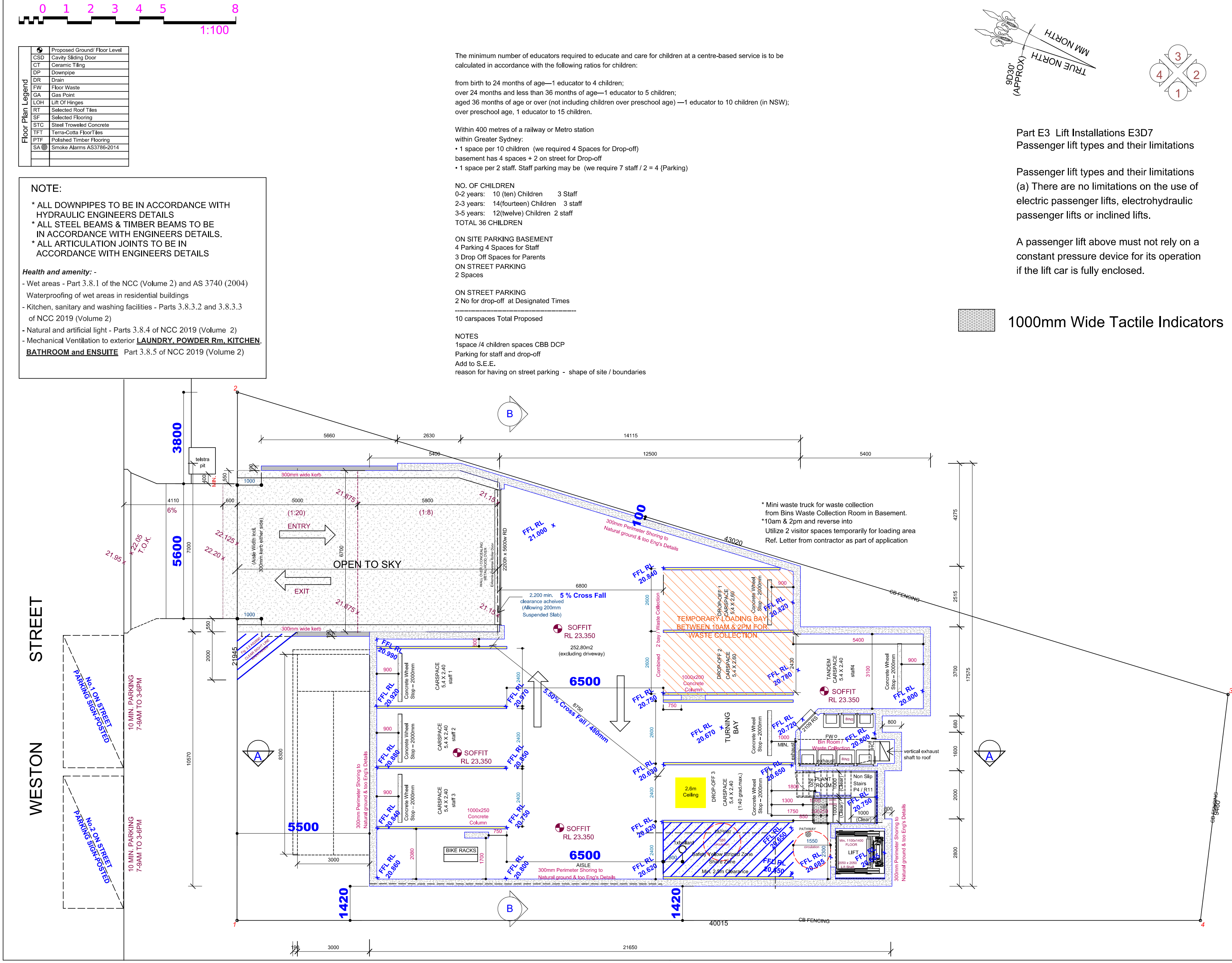
NOTES
1space /4 children spaces CBB DCP
Parking for staff and drop-off
Add to S.E.E.
reason for having on street parking - shape of site / boundaries

Part E3 Lift Installations E3D7
Passenger lift types and their limitations

Passenger lift types and their limitations
(a) There are no limitations on the use of electric passenger lifts, electrohydraulic passenger lifts or inclined lifts.

A passenger lift above must not rely on a constant pressure device for its operation if the lift car is fully enclosed.

1000mm Wide Tactile Indicators



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BASEMENT PLAN

Scale: 1:100 (A2) | Drawn By: dbb | Drawing No. 03
Date: 03/11/24 | Issue: DA-C

Not FOR CONSTRUCTION

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Client : SMJ Constructions P/L

Project Title : Centre Base Childcare at: **L54, 169 Weston Street, Panania**

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Floor Plan Legend		
	⊕	Proposed Ground/ Floor Level
	CSD	Cavity Sliding Door
	CT	Ceramic Tiling
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	TFT	Terra-Cotta FloorTiles
	PTF	Polished Timber Flooring
	SA	Smoke Alarms AS3786-2014

37.87% Of front Building Line
Actual 114.32m2 Actual 43.30m2
(Variation Sought for Front
building Line Landscape with Trees Canopy
Overall Site Complies is over Min landscape
Area

1000mm Wide Tactile Indicators

NOTE:

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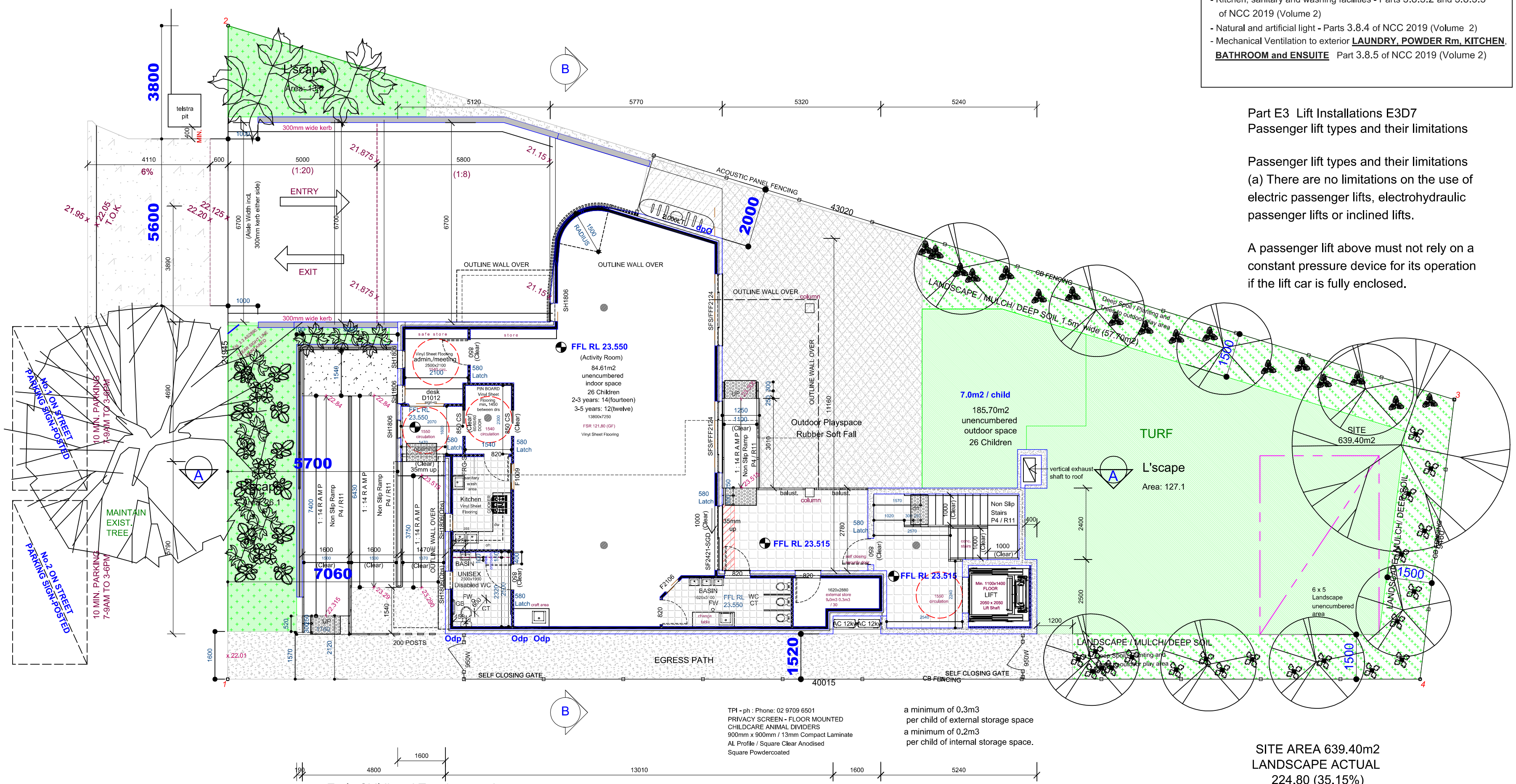

TPI - ph : Phone: 02 9709 6501
PRIVACY SCREEN - FLOOR MOUNTED
CHILDCARE ANIMAL DIVIDERS
900mm x 900mm / 13mm Compact Laminate
AL Profile / Square Clear Anodised
Square Powdercoated

a minimum of 0.3m3 per child of external storage space
a minimum of 0.2m3 per child of internal storage space.

SITE AREA 639.40m2
LANDSCAPE ACTUAL
224.80 (35.15%)

5 no. Early Childhood Teacher requirements in accordance to Australian Childrens Education & care Quality Authority

0 1 2 3 4 5 8
1:100

MM NORTH
TRUE NORTH
9D30' (APPROX)

GROUND FLOOR PLAN
Scale: 1:100 (A2)
Drawn By: dbb
Drawing No. 04
Date: 03/11/24
Issue: DA-C

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Floor Plan Legend

(symbol)	Proposed Ground/ Floor Level
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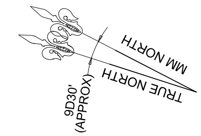
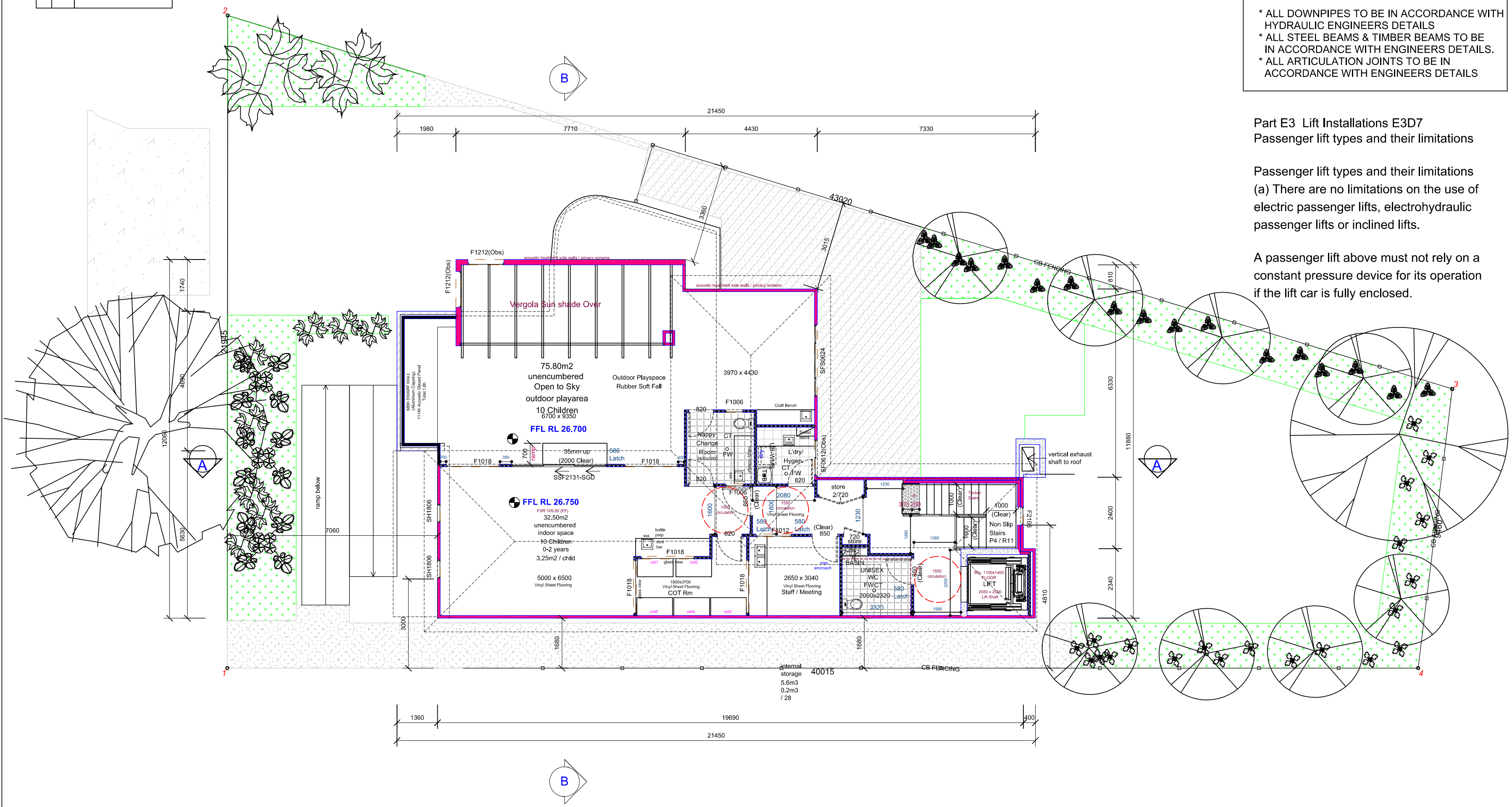
1000mm Wide Tactile Indicators





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FIRST FLOOR PLAN

Scale: 1:100 (A2)
Drawn By: dbb
Drawing No. 05
Date: 03/11/24
Issue: DA-C

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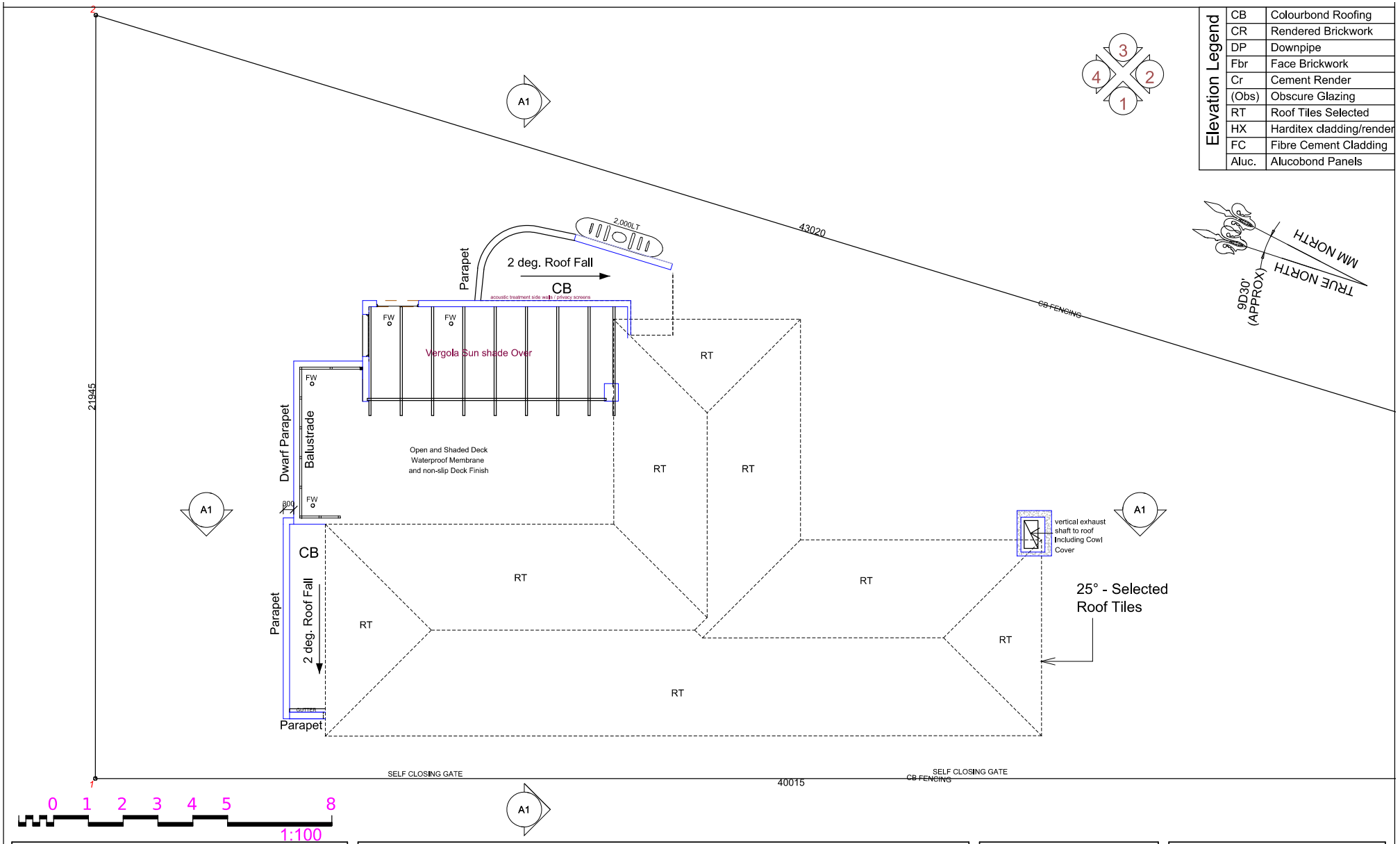

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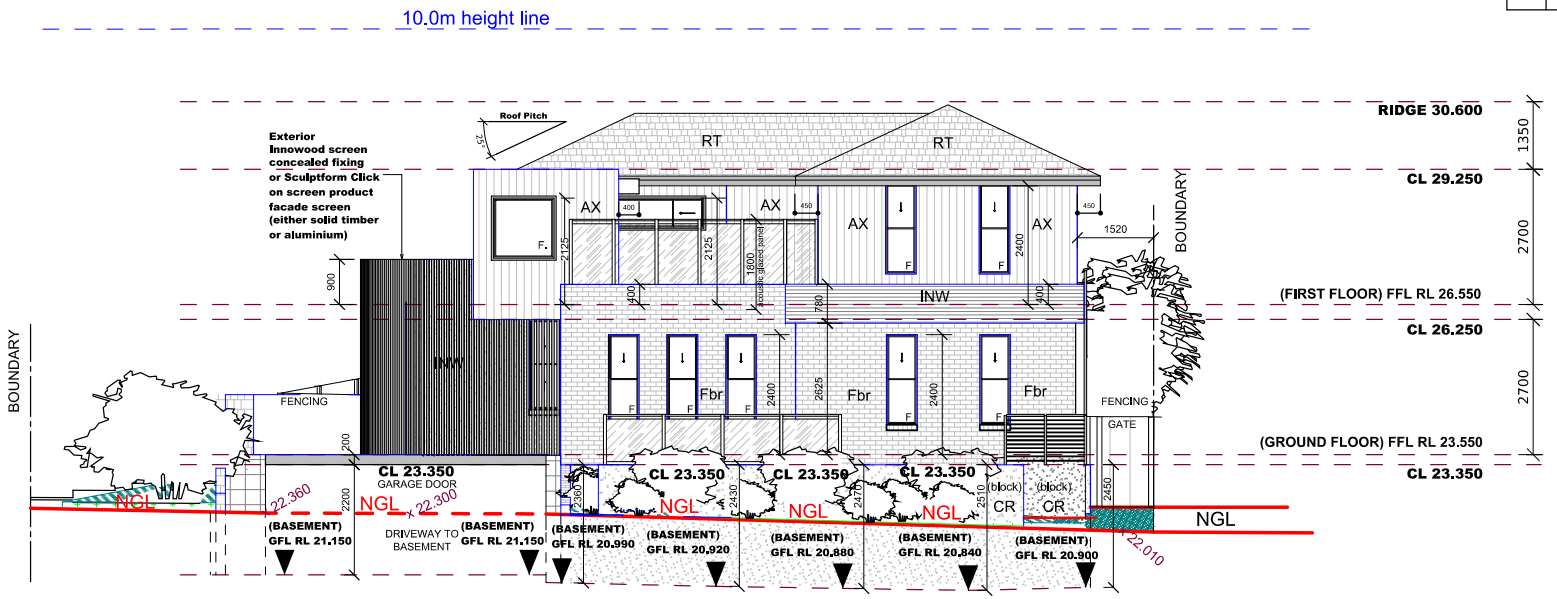
ROOF FLOOR PLAN

Scale:	Drawn By:	Drawing No.
1:100	dbb	06
Date:	Issue:	
03/11/24	DA-C	

Elevation Legend		
	RT	Selected Roof Tiles
	HX	Harditex cladding/render
	(Obs)	Obscure Glazing
	Ax	Axon vertical cladding
	Apol.	Apolic Cladding
	CR	Acrylic Render
	Fbr	Facebrick
	INW	Innowood or Sculpform



NORTH WEST ELEVATION
FRONT ELEVATION
(TO WESTON STREET)

0 1 2 3 4 5 8
1:100

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W: d-b-b.com
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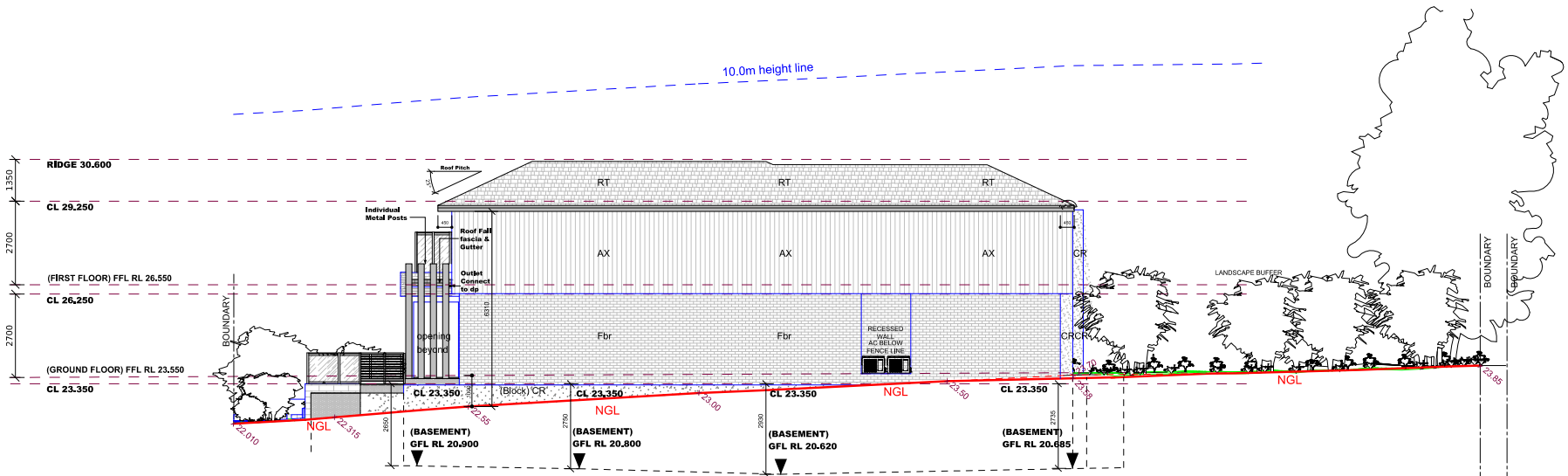
FRONT ELEVATION

Scale:	Drawn By:	Drawing No.
1:100	dbb	07
Date:	Issue:	
03/11/24	DA-C	

Elevation Legend	
RT	Selected Roof Tiles
HX	Harditex cladding/render
(Obs)	Obscure Glazing
Ax	Axon vertical cladding
Apol.	Apolic Cladding
CR	Acrylic Render
Fbr	Facebrick
INW	Innowood or Sculpform



ELEVATIONS

Scale: 1:100 | Drawn By: dbb | Drawing No. 08

Date: 03/11/24 | Issue: DA-C

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Project Title : Centre Base Childcare at: L54, 169 Weston Street, Panania

1:100

0 1 2 3 4 5 8

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8128-1 Rev A Appendix C

Elevation Legend

RT	Selected Roof Tiles
HX	Harditex cladding/render
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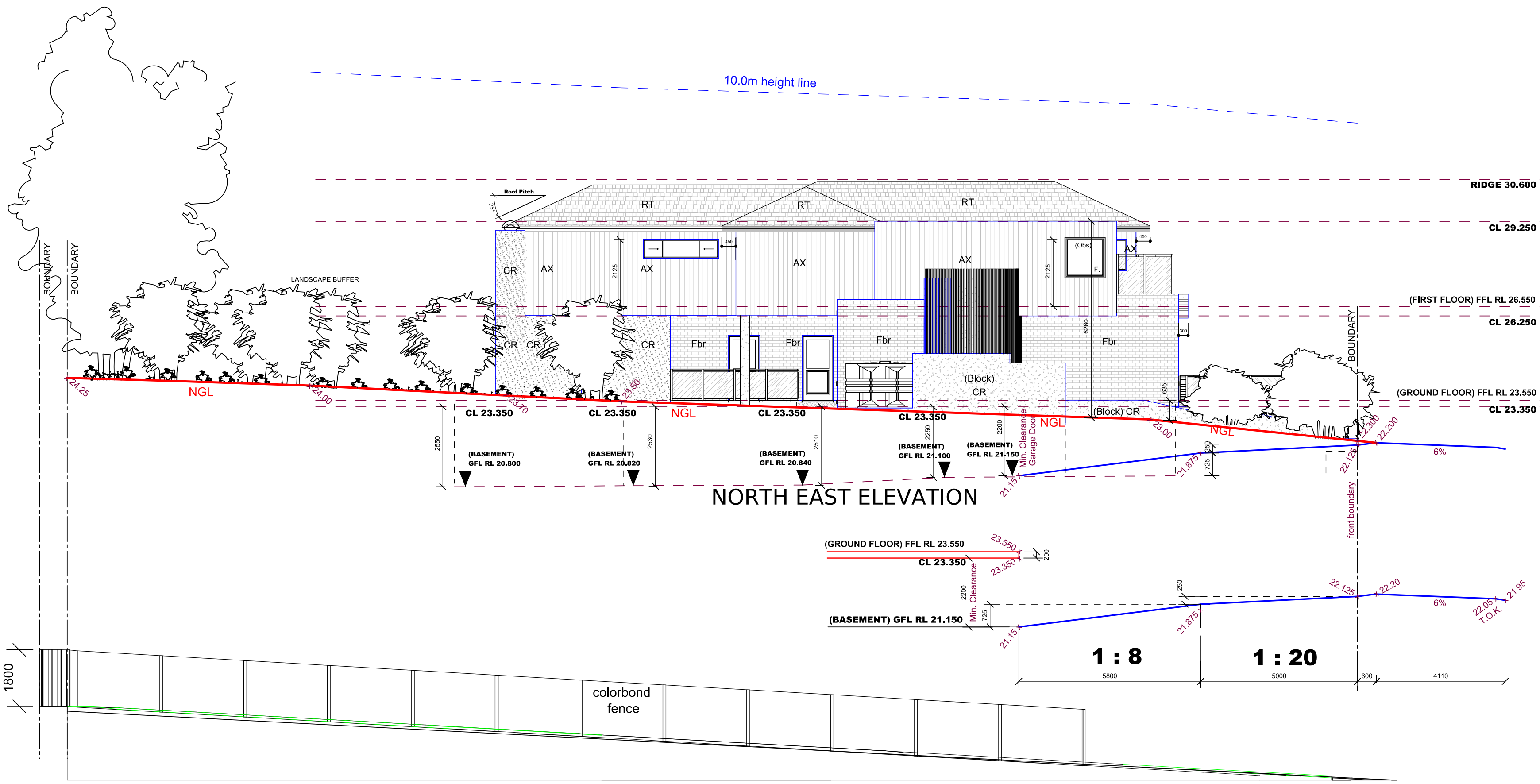

NORTH EAST ELEVATION

NORTH EAST FENCING ELEVATION

ELEVATIONS

Drawing No. 09

Scale: 1:100

Drawn By: dbb

Date: 03/11/24

Issue: DA-C

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Elevation Legend		
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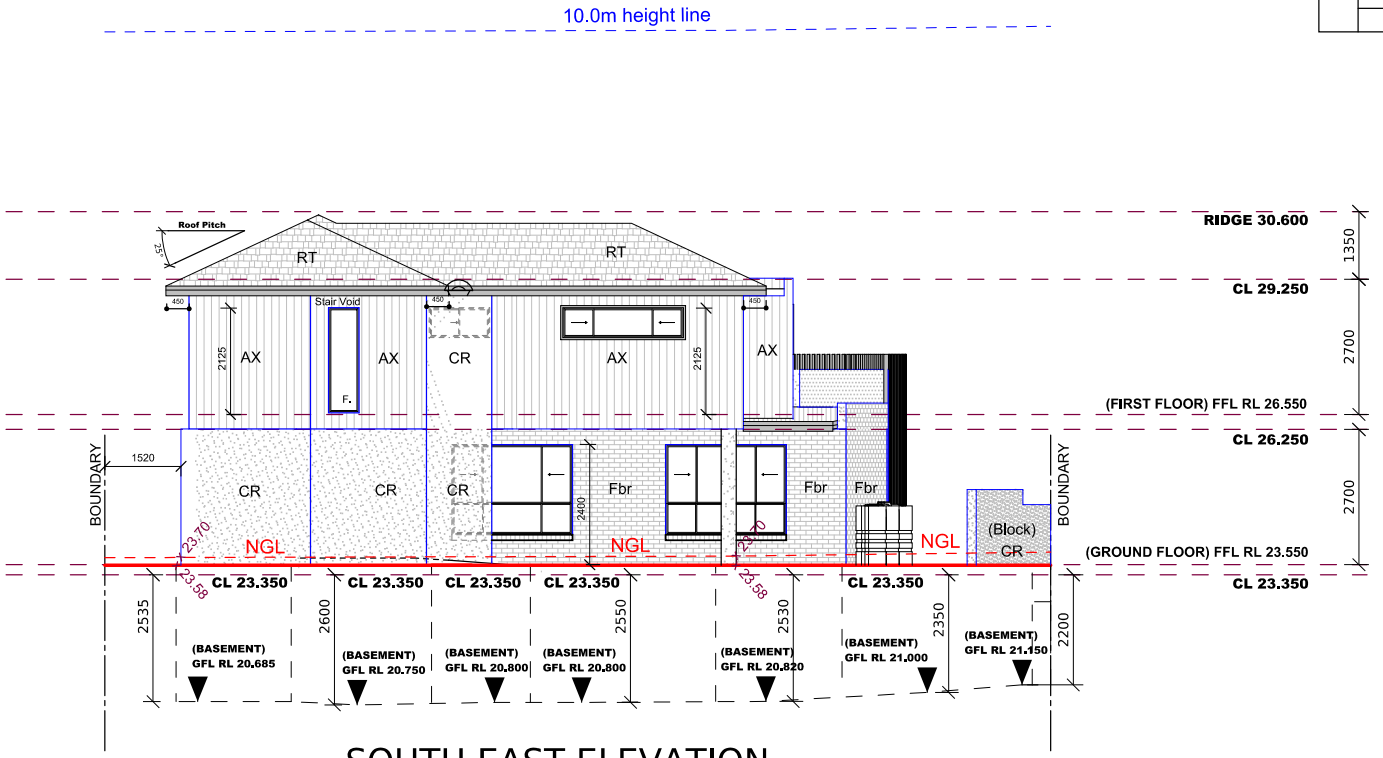

SOUTH EAST ELEVATION

dbb design - basix - build
PCF
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Project Title :
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REAR ELEVATION

Scale:	Drawn By:	Drawing No.
1:100	dbb	10
Date:	Issue:	
03/11/24	DA-C	

Floor Plan Legend	
	Proposed Ground/ Floor Level
CSD	Cavity Sliding Door
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STC	Steel Trowelled Concrete
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SA	Smoke Alarms AS3786-2014

37.87% Of front Building Line
Actual 114.32m2 Actual 43.30m2
(Variation Sought for Front
building Line Landscape with Trees Canopy
Overall Site Complies is over Min landscape
Area

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Windows/Doors to remain closed when room is in use

2.1 m barrier

2.1 m barrier

3-5YO Group

2-3YO Group

2.7 m barrier

Exhaust Fans

Condensers

1.8 m barrier

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Passenger lift types and their limitations

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(b) Lifts above must not rely on a constant pressure device for its operation if the lift car is fully enclosed.

FFL RL 23,550
(Activity Room)
84.61m2
unencumbered
indoor space
26 Children
2-3 years: 14(fourteen)
3-5 years: 12(twelve)

7.0m2 / child
185.70m2
unencumbered
outdoor space
26 Children

FFL RL 23.515

TURF

L'scape
Area: 127.1

SITE
639.40m2

EGRESS PATH

SELF CLOSING GATE

ENTRY

EXIT

MAINTAIN EXIST. TREE

No.1 ON STREET PARKING SIGN POSTED
10 MIN. PARKING 7-9AM TO 3-6PM

No.2 ON STREET PARKING SIGN POSTED
10 MIN. PARKING 7-9AM TO 3-6PM

TPI - ph : Phone: 02 9709 6301
PRIVACY SCREEN - FLOOR MOUNTED
CHILDCARE ANIMAL DIVIDERS
900mm x 900mm / 13mm Compact Laminate
A1 Profile / Square Clear Anodised

a minimum of 0.3m3 per child of external storage space
a minimum of 0.2m3 per child of internal storage space.

5 no. Early Childhood Teacher requirements in accordance to Australian Childrens Education & care Quality Authority

SITE AREA 639.40m2
LANDSCAPE ACTUAL
224.80 (35.15%)

0 1 2 3 4 5 8
1:100

GROUND FLOOR PLAN
Drawing No. 04
Scale: 1:100 (A2)
Drawn By: dbb
Date: 03/11/24
Issue: DA-C

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Floor Plan Legend		
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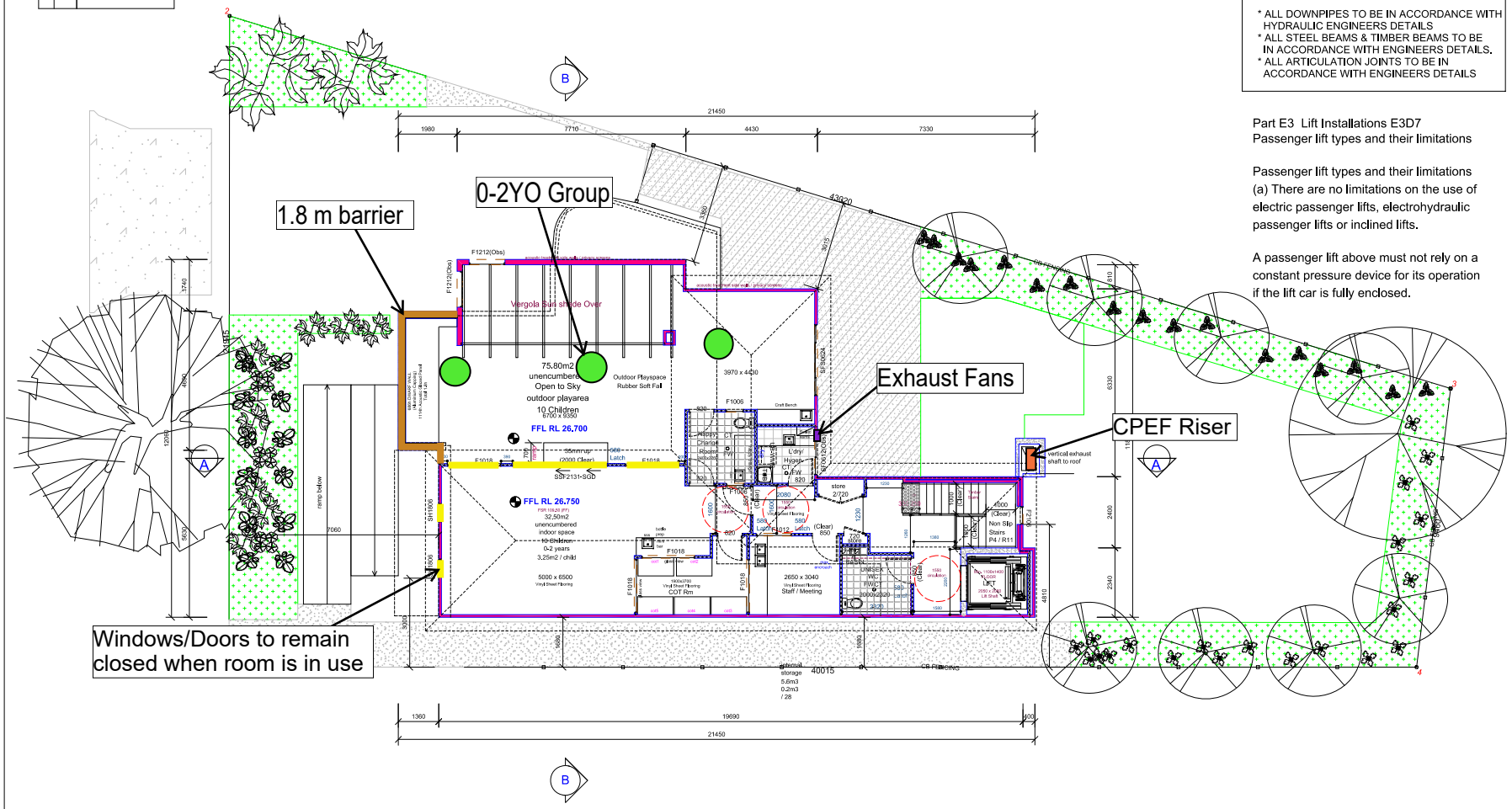

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FIRST FLOOR PLAN
Drawing No. 05
Scale: 1:100 (A2)
Drawn By: dbb
Date: 03/11/24
Issue: DA-C

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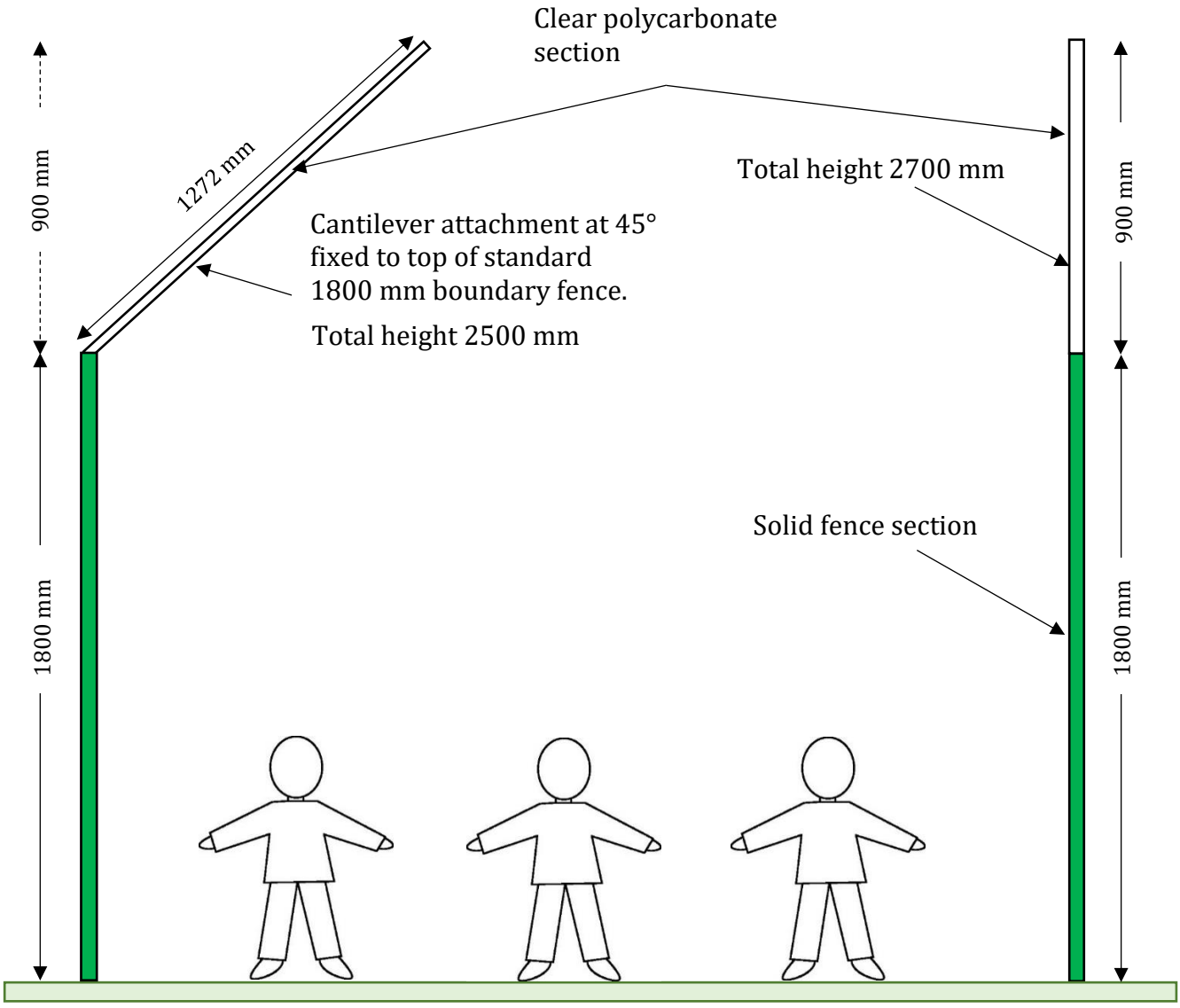
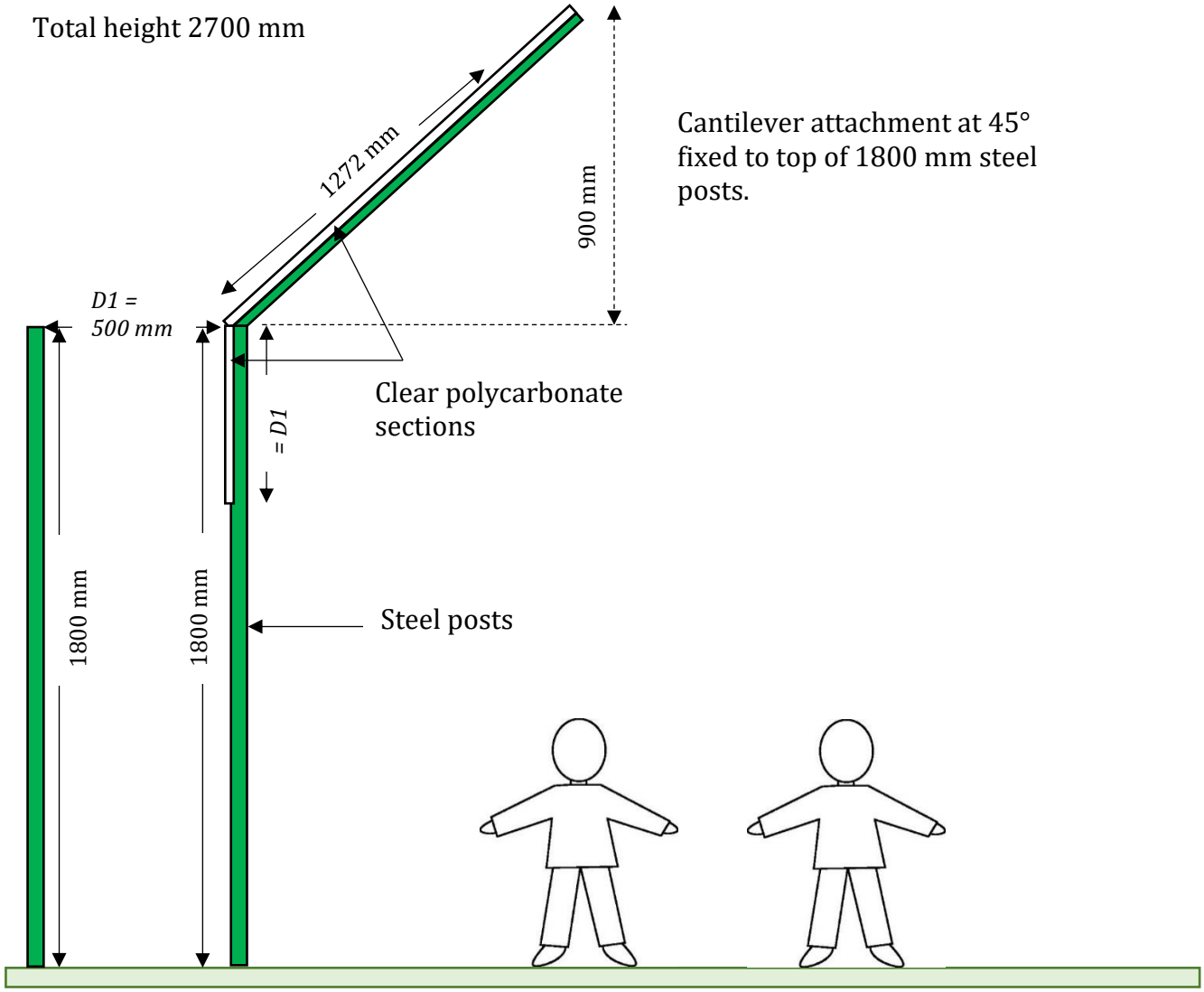
OUTDOOR PLAY AREA



Not To Scale

OUTDOOR PLAY AREA



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ACOUSTICAL – Pertaining to the science of sound, including the generation, propagation, effects and control of both noise and vibration.

AMBIENT NOISE – The ambient noise level at a particular location is the overall environmental noise level caused by all noise sources in the area, both near and far, including road traffic, factories, wind in the trees, birds, insects, animals, etc.

AUDIBLE – means that a sound can be heard. However, there are a wide range of audibility grades, varying from "barely audible" to "just audible", "clearly audible" and "prominent". Chapter 83 of the NSW Environment Protection Authority – Environmental Noise Control Manual (1985) states:
"noise from a particular source might be offensive if it is clearly audible, distinct from the prevailing background noise and of a volume or character that a reasonable person would be conscious of the intrusion and find it annoying or disruptive".

It follows that the word "audible" in an environmental noise context means "clearly audible".

BACKGROUND NOISE LEVEL – Silence does not exist in the natural or the built-environment, only varying degrees of noise. The Background Noise Level is the average minimum dBA level of noise measured in the absence of the noise under investigation and any other short-term noises such as those caused by cicadas, lawnmowers, etc. It is quantified by the L_{A90} or the dBA noise level that is exceeded for 90 % of the measurement period (usually 15 minutes).

- **Assessment Background Level (ABL)** is the single figure background level representing each assessment period – day, evening and night (ie three assessment background levels are determined for each 24hr period of the monitoring period). Determination of the assessment background level is by calculating the tenth percentile (the lowest tenth percent value) of the background levels (L_{A90}) for each period (refer: NSW Industrial Noise Policy, 2000).
- **Rating Background Level (RBL)** as specified by the Environment Protection Authority is the overall single figure (L_{A90}) background noise level representing an assessment period (day, evening or night) over a monitoring period of (normally) three to seven days.

  The RBL for an assessment period is the median of the daily lowest tenth percentile of L_{90} background noise levels.

  If the measured background noise level is less than 30 dBA, then the Rating Background Level (RBL) is considered to be 30 dBA.

DECIBEL – The human ear has a vast sound-sensitivity range of over a thousand billion to one. The decibel is a logarithmic unit that allows this same range to be compressed into a somewhat more comprehensible range of 0 to 120 dB. The decibel is ten times the logarithm of the ratio of a sound level to a reference sound level. See also Sound Pressure Level and Sound Power Level.

Decibel noise levels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dBA, and another similar machine is placed beside it, the level will increase to 53 dBA, not 100 dBA. Ten similar machines placed side by side increase the sound level by 10 dBA, and one hundred machines increase the sound level by 20 dBA.

dBA – The human ear is less sensitive to low frequency sound than high frequency sound. We are most sensitive to high frequency sounds, such as a child's scream. Sound level meters have an inbuilt weighting network, termed the dBA scale, that approximates the human loudness response at quiet sound levels (roughly approximates the 40 phon equal loudness contour).

However, the dBA sound level provides a poor indication of loudness for sounds that are dominated by low frequency components (below 250 Hz). If the difference between the "C" weighted and the "A" weighted sound level is 15 dB or more, then the NSW Industrial Noise Policy recommends a 5 dBA penalty be applied to the measured dBA level.

dBC – The dBC scale of a sound level meter is similar to the dBA scale defined above, except that at high sound intensity levels, the human ear frequency response is more linear. The dBC scale approximates the 100 phon equal loudness contour.

EQUIVALENT CONTINUOUS NOISE LEVEL, L_{Aeq} – Many noises, such as road traffic or construction noise, vary continually in level over a period of time. More sophisticated sound level meters have an integrating electronic device inbuilt, which average the A weighted sound pressure levels over a period of time and then display the energy average or L_{Aeq} sound level. Because the decibel scale is a logarithmic ratio the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closely to the L_{Aeq} noise level.

FREE FIELD – This is a sound field not subject to significant reflection of acoustical energy. A free field over a reflecting plane is usually outdoors with the noise source resting on hard flat ground, and not closer than 6 metres to any large flat object such as a fence or wall; or inside an anechoic chamber.

FREQUENCY – The number of oscillations or cycles of a wave motion per unit time, the SI unit being the Hertz, or one cycle per second.

IMPACT ISOLATION CLASS (IIC) – The American Society for Testing and Materials (ASTM) has specified that the IIC of a floor/ceiling system shall be determined by operating an ISO 140 Standard Tapping Machine on the floor and measuring the noise generated in the room below. The IIC is a number found by fitting a reference curve to the measured octave band levels and then deducting the sound pressure level at 500 Hz from 110 decibels. Thus the higher the IIC, the better the impact sound isolation.

IMPACT SOUND INSULATION ($L_{nT,w}$) – Australian Standard AS ISO 717.2 – 2004 has specified that the Impact Sound Insulation of a floor/ceiling system be quantified by operating an ISO 140 Standard Tapping Machine on the floor and measuring the noise generated in the room below. The Weighted Standardised Impact Sound Pressure Level ($L_{nT,w}$) is the sound pressure level at 500 Hz for a reference curve fitted to the measured octave band levels. Thus the lower $L_{nT,w}$ the better the impact sound insulation.

IMPULSE NOISE – An impulse noise is typified by a sudden rise time and a rapid sound decay, such as a hammer blow, rifle shot or balloon burst.

INTRUSIVE NOISE LEVEL, L_{Aeq} – The level of noise from a factory, place of entertainment, etc. in NSW is assessed on the basis of the average maximum noise level, or the $L_{Aeq\ (15\ min)}$. This is the energy average A weighted noise level measured over any 15 minute period.

LOUDNESS – The degree to which a sound is audible to a listener is termed the loudness. The human ear perceives a 10 dBA noise level increase as a doubling of loudness and a 20 dBA noise increase as a quadrupling of the loudness.

MAXIMUM NOISE LEVEL, L_{Amax} – The rms maximum sound pressure level measured on the "A" scale of a sound level meter during a noise survey is the L_{Amax} noise level. It may be measured using either the Fast or Slow response time of the meter. This should be stated.

NOISE RATING NUMBERS – A set of empirically developed equal loudness curves has been adopted as Australian Standard AS1469-1983. These curves allow the loudness of a noise to be described with a single NR number. The Noise Rating number is that curve which touches the highest level on the measured spectrum of the subject noise. For broadband noise such as fans and engines, the NR number often equals the dBA level minus five.

NOISE – Noise is unwanted sound. Sound is wave motion within matter, be it gaseous, liquid or solid. "Noise includes sound and vibration".

NOISE REDUCTION COEFFICIENT – See: "Sound Absorption Coefficient".

OFFENSIVE NOISE - (Reference: Dictionary of the Protection of the Environment Operations Act 1997). *"Offensive Noise means noise:*

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or likely to be harmful to) a person who is outside the premise from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulations."

PINK NOISE – Pink noise is a broadband noise with an equal amount of energy in each octave or third octave band width. Because of this, Pink Noise has more energy at the lower frequencies than White Noise and is used widely for Sound Transmission Loss testing.

REVERBERATION TIME, T_{60} – The time in seconds, after a sound signal has ceased, for the sound level inside a room to decay by 60 dB. The first 5 dB decay is often ignored, because of fluctuations that occur while reverberant sound conditions are being established in the room. The decay time for the next 30 dB is measured and the result doubled to determine the T_{60}. The Early Decay Time (EDT) is the slope of the decay curve in the first 10 dB normalised to 60 dB.

SOUND ABSORPTION COEFFICIENT, α – α Sound is absorbed in porous materials by the viscous conversion of sound energy to heat energy as the sound waves pass through it. Sound is similarly absorbed by the flexural bending of internally damped panels. The fraction of incident energy that is absorbed is termed the Sound Absorption Coefficient, α. An absorption coefficient of 0.9 indicates that 90 % of the incident sound energy is absorbed. The average α from 250 to 2000 Hz is termed the Noise Reduction Coefficient (NRC).

SOUND ATTENUATION – If an enclosure is placed around a machine, or a silencer is fitted to a duct, the noise emission is reduced or attenuated. An enclosure that attenuates the noise level by 30 dBA, reduces the sound energy by one thousand times.

SOUND EXPOSURE LEVEL (SEL) – The total sound energy of a single noise event condensed into a one second duration or in other words it is an L_{eq} (1 sec).

SOUND PRESSURE LEVEL, L_p – The level of sound measured on a sound level meter and expressed in decibels, dB, dBA, dBC, etc. $L_p = 20 \times \log (P/P_o)$ ... dB

where P is the rms sound pressure in Pascal and P_o is a reference sound pressure of 20 µPa. L_p varies with distance from a noise source.

SOUND POWER LEVEL, L_w – The Sound Power Level of a noise source is an absolute that does not vary with distance or with a different acoustic environment.

$L_w = L_p + 10 \log A$ ... dB, re: 1pW,
where A is the measurement noise-emission area in square metres in a free field.

SOUND TRANSMISSION CLASS (STC) – An internationally standardised method of rating the sound transmission loss of partition walls to indicate the decibels of noise reduction of a human voice from one side to the other. (Refer: Australian Standard AS1276 – 1979)

SOUND TRANSMISSION LOSS – The amount in decibels by which a random sound is reduced as it passes through a sound barrier. A method for the measurement of airborne Sound Transmission Loss of a building partition is given in Australian Standard AS1191 - 2002.

STATISTICAL EXCEEDENCE SOUND LEVELS, L_{A90}, L_{A10}, L_{A1}, etc – Noise which varies in level over a specific period of time (usually 15 minutes) may be quantified in terms of various statistical descriptors:

The L_{A90} is the dBA level exceeded for 90 % of the time. In NSW the L_{A90} is measured over periods of 15 minutes, and is used to describe the average minimum or background noise level.

The L_{A10} is the dBA level that is exceeded for 10 % of the time. In NSW the L_{A10} measured over a period of 10 to 15 minutes. It was until recently used to describe the average maximum noise level, but has largely been replaced by the L_{Aeq} for describing level-varying noise.

The L_{A1} is the dBA level that is exceeded for 1 % of the time. In NSW the L_{A1} may be used for describing short-term noise levels such as could cause sleep arousal during the night.

STEADY NOISE – Noise, which varies in level by 6 dBA or less, over the period of interest with the time-weighting set to "Fast", is considered to be "steady". (Refer AS 1055.1 1997)

WEIGHTED SOUND REDUCTION INDEX, R_w – This is a single number rating of the airborne sound insulation of a wall, partition or ceiling. The sound reduction is normally measured over a frequency range of 100 to 3,150 Hertz and averaged in accordance with ISO standard weighting curves (Refer AS/NZS 1276.1:1999).

Internal partition wall $R_w + C$ ratings are frequency weighted to simulate insulation from human voice noise. The $R_w + C$ is always similar in value to the STC rating value. External walls, doors and windows may be $R_w + C_{tr}$ rated to simulate insulation from road traffic noise. This is normally a lower number than the STC rating value.

WHITE NOISE – White noise is broadband random noise whose spectral density is constant across its entire frequency range. The sound power is the same for equal bandwidths from low to high frequencies. Because the higher frequency octave bands cover a wider spectrum, white noise has more energy at the higher frequencies and sounds like a hiss.