

CHILD CARE CENTRE, TAREE

NOISE ASSESSMENT

Client: PTS Preschool

Report No. M25070.01

Site: 13-15 Chatham Ave Taree, NSW 2430

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SUMMARY

It is proposed to increase the number of children at the Darwin Montessori Early Learning Centre the facility from 28 to 68.

Noise from children playing outside the centre is predicted to comply with the guideline if the children playing for less than two hours a day. Minor exceedances of the NSW Noise Policy for Industry (NPfI) 2017 guidelines are predicted if more than two hours of outdoor play is required for all the children at the facility. If the centre requires more than two hours of outdoor play per day, there are two strategies available to mitigate noise levels: increase the height of the boundary fence, or stagger the access to the outdoor area.

Noise to the neighbouring school hall at Chatham Public School will be satisfactory.

Traffic noise into the centre will be generally satisfactory.

Noise from traffic generated by the development will be satisfactory.

Mechanical services have not yet been designed, however, they should meet the noise emission requirements of the NPfI as outlined in this report.

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1 INTRODUCTION

The Darwin Montessori Early Learning Centre is a childcare facility at 15 Chatham Avenue, Chatham NSW 2430. It is proposed to increase the number of children at the facility from 28 to 68. The proposal incorporates the neighbouring block at 13 Chatham Avenue. This report gives the noise assessment of the proposal, including:

- Noise from children playing.
- Noise from mechanical services.
- Noise from car parking; and
- Noise from traffic generated by the development.

The report also discusses noise intrusion into the development from traffic on nearby roads.

2 LOCATION AND DESCRIPTION OF THE DEVELOPMENT

The location of the development is shown on Figure 2-1. There are residential neighbours on all sides. We will assess noise emission from the development at the six nearest residences:

Receiver Number	Address
1	11 Chatham Ave
2	12 Cowper St
3	14 Cowper St
4	16 Cowper St
5	26 Chatham Ave
6	Chatham Public School Hall

Table 2-1 List of receivers around the proposed childcare centre



Figure 2-1 Location of Development and Noise Logger

Figure 2-2 shows the proposed layout of the development. Figure 2-3 shows the plan of the ground floor classrooms.

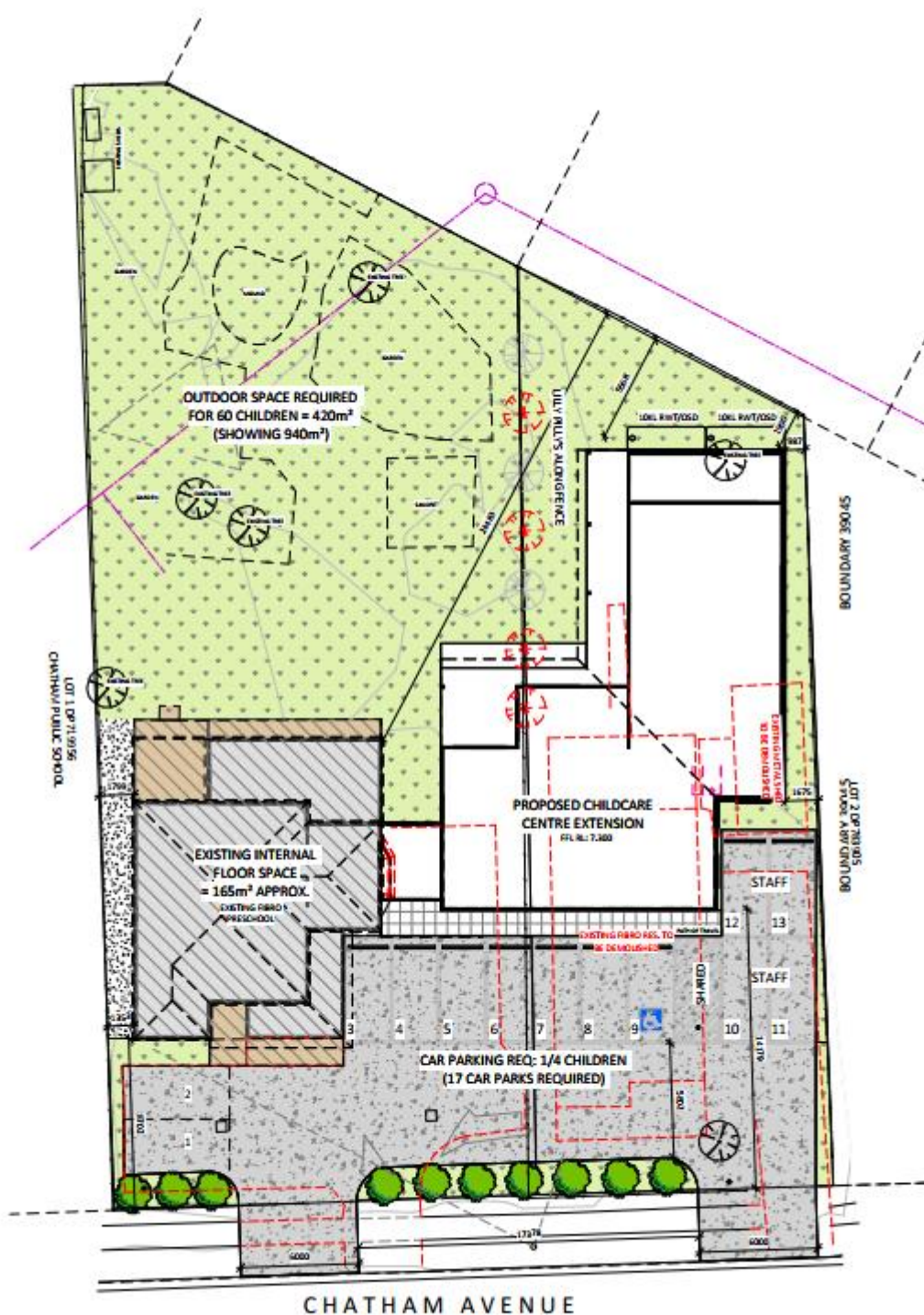


Figure 2-2 Layout of Development

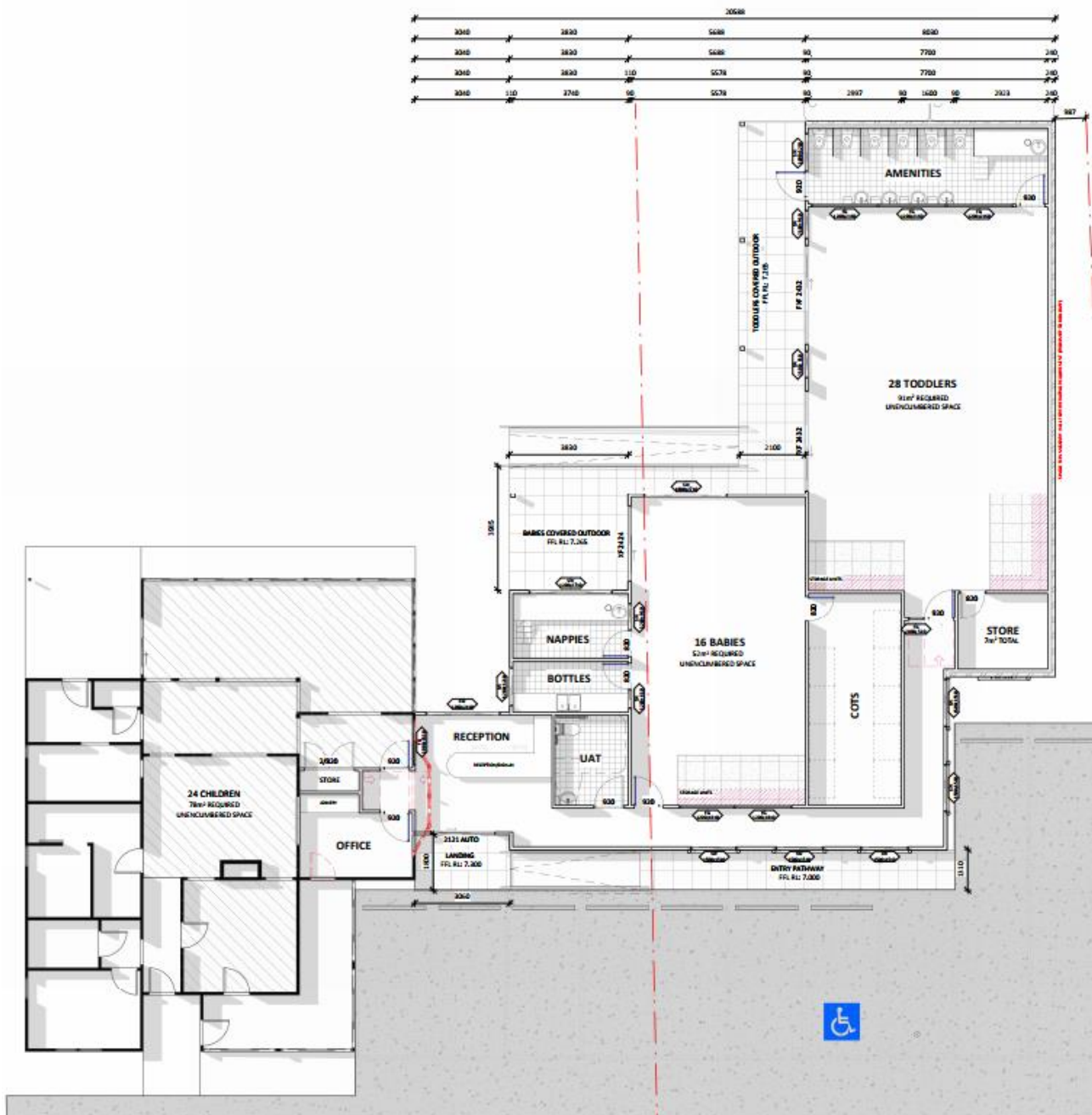


Figure 2-3 Plan of Ground Floor

Opening hours will be from 8.00 am to 5.15 pm (website). This is wholly within the daytime period as defined by the EPA. The EPA daytime hours are from 7 AM to 6 PM. The opening hours could be extended without changing the outcomes of this assessment as long as they remain within the EPA designated daytime hours.

3 NOISE MEASUREMENTS

Noise measurements were taken on site to determine the existing noise environment. As the results are used to set noise limits and assess traffic noise, the results of the measurements will be presented first.

Noise measurements were conducted between 13 to 20 March 2025 at the location shown in Figure 2-1.

Long term background noise measurements were recorded using a Type I integrating sound level meter (SLM), model EL-316X, manufactured by Acoustic Research Labs. A Lutron sound level calibrator, model SC-941, was used as a reference sound source immediately before and after measurements were taken. Both instruments are in current calibration from a NATA registered laboratory. An integrating sound level meter can process a continuous, variable, intermittent or impulsive signal to give a single integrated level or L_{Aeq} for the sampling period. This equipment complies with AS 1259 ‘Acoustics-Sound level meters’, Part 2 “Integrating-Averaging” and the testing procedure with AS 2659 “Guide to the use of sound measuring equipment.

Some short term traffic noise measurements from Chatham Avenue, and noise from children playing were taken using a Svan Type 957 Sound Level Meter.

Appendix B shows the daily noise charts. Periods of excess wind or rain have been excluded as per NPfI recommendations.

3.1 BACKGROUND NOISE LEVELS

Table 3-1 shows the measured background noise levels.

Period	RBL
Daytime	40
Evening	34
Night-time	32

Note: Daytime is defined as 7.00am to 6.00pm, Monday to Saturday; 8.00am to 6.00pm Sunday and Public Holidays.
Evening is defined as 6.00pm to 10.00pm, Monday to Saturday and Public Holidays.
Night is defined as 10.00pm to 7.00am, Monday to Saturday; 10.00pm to 8.00am Sunday and Public Holidays.

Table 3-1 Measured background A-weighted sound pressure levels.

3.2 TRAFFIC NOISE LEVELS

The traffic noise level at 10m from Chatham Ave was typically $L_{Aeq,1hr}$ 57-60 dBA during our site visits.

4 NOISE ASSESSMENT CRITERIA

4.1 ENVIRONMENT PROTECTION AGENCY GUIDELINES

For noise emission other than from children playing, assessment criteria are discussed in the New South Wales Noise Policy for Industry (NPfI). The NPfI gives a procedure for setting “trigger” noise levels. If noise is above a trigger level, a residual noise impact may exist. Depending on the severity of the residual noise impact mitigation or management needs to be considered.

The policy discusses “intrusiveness” and “amenity” levels which are a set based on the existing noise environment, and the type of residential area. The project specific trigger levels become the most stringent of the two.

4.1.1 INTRUSIVENESS NOISE LEVEL

For assessing intrusiveness, the background noise level (L_{A90}) is measured, and the Rating Background Level (RBL) determined. The intrusiveness of an industrial noise source may generally be considered acceptable if the equivalent continuous noise level (L_{Aeq}) of the source (measured over a 15-minute period) does not exceed the RBL by more than 5 dB.

4.1.2 AMENITY NOISE LEVEL

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5 dB below the recommended amenity noise level. While amenity is assessed over the entire 13-hour daytime period, under the NPfI it can be compared directly to the 15-minute assessment of intrusiveness by adding 3 dB to the period level.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

An extract from the NSW NPfI that relates to the amenity noise levels for surrounding receivers is given in Table 4-1 and applies to all receivers in this study.

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level dB
Residential	Suburban	Day	55
		Evening	45
		Night	45

Note: Daytime is defined as 7.00am to 6.00pm, Monday to Saturday; 8.00am to 6.00pm Sunday and Public Holidays.
Evening is defined as 6.00pm to 10.00pm, Monday to Saturday and Public Holidays.
Night is defined as 10.00pm to 7.00am, Monday to Saturday; 10.00pm to 8.00am Sunday and Public Holidays.

Table 4-1 Recommended amenity criteria from the NSW Noise Policy for Industry.

4.1.3 PROJECT NOISE TRIGGER LEVELS

The project noise trigger levels are given in Table 4-2. The NPfI gives guidance on assessing the noise impact if the noise from industry exceeds the trigger level.

Period	Rating Background Level L _{A90,15min} (dBA)	Intrusiveness Noise Level ¹ L _{Aeq,15min} (dBA)	Project Amenity Noise Level ² L _{Aeq,15min} (dBA)	Project Trigger Levels L _{Aeq,15min} (dBA)
Daytime	40	45	53	45
Evening	34	39	43	39
Night-time	32	37	38	37

Note 1: Intrusiveness noise level is L_{Aeq,15min} ≤ RBL +5 dB

Note 2: Project amenity noise level (PANL) is suburban ANL minus 5dBA plus 3dBA to convert from a period level to a 15-minute level.

Table 4-2 Project trigger levels for all Receivers

4.2 NOISE FROM CHILDREN PLAYING

The NPfI and Noise Guide for Local Government (NGLG) are unsuitable for assessment of noise from children playing. Matrix Thornton considers that the *Guideline for Child Care Centre Acoustic Assessment* (2010) published by the Australian Association of Acoustical Consultants (AAAC) provides appropriate noise goals. These are as follows:

- **Up to 2 hours (total) per day** – The L_{eq,15min} noise level emitted from the outdoor play area shall not exceed the background noise level by more than 10dB at the assessment location.
- **More than 2 hours per day** – The L_{eq,15min} noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5dB at the assessment location.

The daytime RBL is 40dBA, hence the guideline for children playing is therefore L_{Aeq,15min} 50dBA for up to 2 hours play, and 45dBA for more than 2 hours outdoor play.

4.3 NOISE INTO THE CHILD CARE CENTRE AND NEIGHBOURING SCHOOL

The NSW NPfI recommends two criteria for schools. For assessing childcare centers, it is usual to consider play areas as active recreation area playgrounds, and internal areas such as sleeping areas and activity rooms/classrooms. The relevant criteria are:

- Outdoor play areas L_{Aeq} 55dBA when in use; and
- Classrooms (internal) 35-40dBA (the AAAC guideline recommends 40dBA).

There are no current sources of industrial noise that could affect the Centre, however there is traffic noise. The NSW Road Noise Policy (RNP) recommends school classrooms traffic noise levels less than L_{Aeq,1hr} 40dBA.

4.4 MAXIMUM NOISE LEVEL EVENTS

Noise sources of short duration and high level that may cause disturbance to sleep if occurring during the night time need to be considered. This childcare centre does not operate during night time hours, therefore no assessment of maximum noise level events is recorded.

5 NOISE PREDICTIONS AND ASSESSMENT

5.1 NOISE MODELLING

Noise emission from the development was modelled using iNoise modelling software, with predictions based on the ISO9613 algorithms.

Noise from the development will be from the carpark, noise from inside the building, noise from children playing outside and noise from any mechanical services such as airconditioning.

Mechanical services have not been designed at this stage but we recommend they be designed to achieve a level below the noise trigger levels set out in Section 4.1.3.

5.2 NOISE FROM CHILDREN PLAYING TO RESIDENTIAL RECEIVERS

To predict noise from inside the centre we have to assume the classroom noise level of 85 dBA and windows open. For noise from the play area we have used the sound power level (L_{AW}) of children playing from the AAAC guide.

- 10 Children aged 0 to 2 years – $L_{AW,eq}$ 77 to 80 dB(A)
- 10 Children aged 2 to 3 years – $L_{AW,eq}$ 83 to 87 dB(A)
- 10 Children aged 3 to 6 years – $L_{AW,eq}$ 84 to 90 dB(A)

A group of 10 children playing was measured at the existing childcare centre. The noise level was 60-65dBA at 6m from the children, corresponding to an $L_{AW,eq}$ 84 to 99. These levels fall within the range of the AAAC data. We will use the AAAC data for the remainder of the assessment.

For peak play times we have assumed 68 children of mixed ages spread through the external play areas, though in effect the noise emission is dominated by the 30 older children. Because the children will be well supervised the predictions are based on the middle part of the range of source noise levels reported by the AAAC guide. Management of the children will be required to ensure adequate supervision.

The predicted noise levels of children playing are shown in Table 5-1. As shown in the table the predicted levels at neighbouring residences comply with the 50 dBA guideline for two hours of outdoor play, there are some minor exceedances of the guideline for more than two hours of play (45 dBA). Those exceedances occur near the rear boundary of the neighbouring properties in Cowper Street, and the noise levels diminish towards the rear facades of those houses. If the centre requires more than two hours of outdoor play per day, there are two strategies available to mitigate noise levels: increase the height of the boundary fence, or stagger the access to the outdoor area.

Reduction of noise by approximately 4dBA will be achieved by increasing the height of the boundary fence to 2.4m.

The reduction of 3dBA is also achieved by allowing only half the children to play in the outdoor area at any time.

Receiver	1.8m fence	Staggered playtime (half children at once)
1	27	24
2	43	40
3	47	44
4	49	46
5	24	24

Table 5-1 Predicted Noise Levels of Children Playing, Residential Receivers, $L_{Aeq,15min}$ dBA

5.3 NOISE FROM CHILDREN PLAYING TO SCHOOL

One building at the neighbouring Chatham Public School is currently impacted by noise emission from the childcare centre. The building is the school hall, and the wall facing the childcare centre is masonry with no windows or doors that open into the noise-sensitive space. The appropriate noise condition is 35 dBA inside the building.

The proposal leads to an increased noise emission of 4dBA from the Childcare Centre. The predicted level from the proposal at the school building is 47 dBA. Based on the layout of the hall, the predicted level indoors is 27 dBA, which complies with the guideline.

5.4 NOISE FROM THE CARPARK

Noise from the carpark will be variable, and, as for other aspects of the proposal, the proposed development will result in an increase of 4dBA over the existing situation. There is no traffic report available for the development. Based on the RMS (2002) Guide to Traffic Generating Developments, and a staff ratio of 1 to every 4 children, we estimate the traffic generation by the procedure shown in Table 5-2, and with the following assumptions:

- 68 Children;
- 17 staff;
- 95% of staff driving.

•

	Morning Peak Hour	Afternoon Peak Hour
Trips per child	0.8	0.7
Trips	55 (in)	48 (out)
Number of Staff	17	17
% driving	95%	95%
% during peak hour	80%	70%
Staff Trips in peak hour	13	11
Total Trips, Staff plus Children	55+13=68	48+11=59

Table 5-2 Traffic Generation during Peak Hour

The typical source noise level of a car entering and leaving a carpark, including door slams, car starts and accelerations, is $L_{Aeq,15min}$ 78dBA. The noise model was used to predict the noise at neighbouring residents, and the results are shown in Table 5-3.

Noise from the proposed carpark is predicted to comply with the 45dBA trigger level at all locations during the afternoon peak periods, with a single 1dBA exceedance at Receiver 5 in the morning peak period.

The NPfI considers this 1dBA exceedance a “residual” impact. A 1dBA residual is considered to have a negligible impact, and given that it is predicted to occur for only 1 hour per day, no mitigation is recommended.

Receiver	Morning Peak Hour	Afternoon Peak Hour
1	38	37
2	23	22
3	21	20
4	20	19
5	46	45

Table 5-3 Predicted Noise Levels of Carpark, $L_{Aeq,15min}$ dBA

5.5 TRAFFIC NOISE INTO THE CENTRE

Based on our measurements, the traffic noise level at the front façade of the facility is typically up to $L_{Aeq,1hr}$ 60dBA.

The facility has been designed so that there are no noise-sensitive rooms with windows or doors facing Chatham Avenue. All noise-sensitive rooms are internal and separated from the front façade by at least a corridor.

Therefore, the traffic noise intrusion into any noise-sensitive room will be less than 40dBA, which is satisfactory.

6 TRAFFIC NOISE GENERATED BY THE DEVELOPMENT

The NSW Road Noise Policy (RNP) traffic noise assessment criteria for existing residences affected by additional traffic due to the developments on existing roads. Chatham Avenue would be considered sub-arterial road; hence the criterion is $L_{Aeq,15hr}$ 60dBA for daytime.

Based on the traffic volumes derived in Section 5.4, and using the Calculation of Road Traffic Noise (CoRTN) algorithms, the noise level at a typical façade, due to extra traffic generated by the proposal would be $L_{Aeq,1hr}$ 52dBA.

This would lead to an increase of up to 1dBA during the morning and afternoon peak periods, however, no significant increase is predicted for the 15 hour assessment period for sub-arterial roads.

Therefore, no impact from traffic noise is predicted.

7 CONCLUSION

Noise issues associated with the proposed expansion of the Darwin Montessori Early Learning Centre located at 13-15 Chatham Ave, Chatham NSW were assessed.

It is proposed to increase the number of children at the facility from 28 to 68. Preliminary noise modelling predicts this would lead to an increase in noise emission from the site by 4 dBA. In this report we assessed the total noise emission of the site.

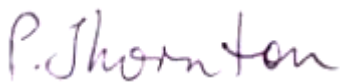
Noise from children playing outside at the centre is predicted to comply with the guideline if the children are playing for less than two hours a day. Minor exceedances of the guideline are predicted if more than two hours of outdoor play is required for all the children at the facility. We recommend staggering the playtime so that only half the children are playing outside at any time. Noise could also be mitigated by increasing the height of the boundary fence to 2.4m.

Noise to the neighbouring school hall at Chatham Public School will be satisfactory.

Traffic noise into the centre will be generally satisfactory.

Noise from traffic generated by the development will be satisfactory.

Mechanical services have not yet been designed; however, they should meet the noise emission requirements of the NPfI as outlined in this report.



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APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Assessment Period	The period in a day over which assessments are made.
dB(A)	Unit of sound level in A-weighted decibels. The A-weighting approximates the sensitivity of the human ear by filtering these frequencies. The dB(A) measurement is considered representative of average human hearing.
L_{Aeq}	The A-weighted equivalent continuous sound pressure level, used to quantify the average noise level over a time period.
L_{A10}	The A-weighted sound pressure level exceeded for 10% of the measurement period. It is usually used as the descriptor for intrusive noise level.
L_{A90}	The A-weighted sound pressure level exceeded for 90% of the measurement period. It is usually used as the descriptor for background noise level.
$L_{Aeq15min}$	Refers to the A-weighted energy averaged equivalent noise level over a 15 minute time period.
L_{Cpeak}	The highest instantaneous C-weighted sound pressure level over the measurement period. It is usually used for high impulsive noise.
L_{Amax}	The maximum A-weighted sound pressure level for the measurement period.
Loudness	A 3dB(A) change in sound pressure level is just noticeable or perceptible to the average human ear; a 5dB(A) increase is quite noticeable and a 10dB(A) increase is typically perceived as a doubling in loudness.
RBL	The overall single figure background level representing the assessment period over the whole monitoring period. For the short-term method of assessment, the RBL is the measured $L_{A90, 15min}$ value, or where a number of measurements have been made, the lowest $L_{A90, 15min}$ value.

APPENDIX B: NOISE LOGGER RESULTS

