Doc. No: 212145-9364

Noise Assessment – Existing Rutherford Pre-school and Proposed OOSH Facility
73-75 Regiment Road, Rutherford NSW 2320

Prepared for:

Rutherford Playtime Preschool
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September 2021

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1.0 INTRODUCTION

This report presents the results, findings and recommendations arising from an acoustic assessment for the existing Rutherford Preschool at 75 Regiment Road, Rutherford and the retrospective approval of an OOSH Facility at 73 Regiment Road, Rutherford.

The investigation was requested by Compass Planning on behalf of the proponent Rutherford Playtime Preschool to support a Development Application to Maitland City Council (Council) to address their typical requirements for such a redevelopment.

The proposal includes the following:

- Establish a 25 place OOSH Facility at the current dwelling on 73 Regiment Road, Rutherford

Under the proposal the OOSH facility would operating at the hours of 6:00 am to 6:00 pm Monday – Friday for 50 weeks per year.

The existing Preschool operates at the hours of 7:00am to 6:00pm Monday – Friday for 50 weeks per year. This child care centre facilitates 58 children and 11 staff members.

Modern child care centres function as early learning facilities rather than simply for child minding. As such, there is emphasis on the guided development of children with organised activities and set objectives. Typically, children will be distributed throughout play areas in supervised groups. From an acoustic point of view this means there is no unrestricted play time during which children would create excessive noise. Activities are supervised at all times by qualified and trained staff members.

The Department of Family and Community Services (FACS) ensures that child care centres comply with the Children's Services Regulation 2004. Under this regulation services must comply with the NSW Cancer Council guidelines which state "Care should be taken to minimise the time spent outdoors between 11 am and 3 pm daylight saving time (10 am and 2 pm Eastern Standard Time), when daily UVR levels are generally at their peak".

As a result of these guidelines children are not typically outside during the hours outlined or if they are then usually for relatively short periods. The time spent outdoors is also subject to weather conditions.

The indoor areas of the new building would be mechanically ventilated. Doors and windows would usually remain closed whilst the children are indoors but it is considered that they could be open at times. An existing

car park for the centre is located at the northern side of the site with access from Regiment Road.

2.0 TERMS AND DEFINITIONS

Table 1 contains the definitions of commonly used acoustical terms and is presented as an aid to understanding this report.

TABLE 1
DEFINITION OF ACOUSTICAL TERMS

Term	Definition
dB(A)	The quantitative measure of sound heard by the human ear, measured by the A-Scale Weighting Network of a sound level meter expressed in decibels (dB).
SPL	Sound Pressure Level. The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.
STL	Sound Transmission Loss. The ability of a partition to attenuate sound, in dB.
Lw	Sound Power Level radiated by a noise source per unit time re 1pW.
Leq	Equivalent Continuous Noise Level - taking into account the fluctuations of noise over time. The time-varying level is computed to give an equivalent dB(A) level that is equal to the energy content and time period.
L1	Average Peak Noise Level - the level exceeded for 1% of the monitoring period.
L10	Average Maximum Noise Level - the level exceeded for 10% of the monitoring period.
L90	Average Minimum Noise Level - the level exceeded for 90% of the monitoring period and recognised as the Background Noise Level. In this instance, the L90 percentile level is representative of the noise level generated by the surrounds of the residential area.

3.0 NOISE CRITERIA

3.1 Noise Emission criteria

In the absence of specific Council DCP's in NSW, there are no detailed regulations or guidelines that cover the operation of a child care centre. The facility will operate as a commercial enterprise and, as such, guidance for the assessment of noise impacts has been taken from the NSW Noise Policy for Industry (NPI), NSW Land and Environment Court precedents and the Association of Australian Acoustical Consultants (AAAC) Childcare Centre noise Assessment Guideline (2009).

The NPI advises that noise emissions from commercial premises should ideally not exceed the ambient background noise levels by more than 5 dB at residential receivers, for up to continuous 24-hour operation.

The issue of noise emissions from child care centres was included in a discussion paper prepared by the Southern Sydney Regional Organisation of Councils (SSROC) in 2005. As stated in the discussion paper, an assessment of 13 Land and Environment Court cases relating

to child care centres revealed the following quotation from a Court judgement:

Council may require that a suitably qualified acoustic consultant undertake an acoustic assessment, which includes recommended noise attenuation measures.

Noise readings (measured at any point on the boundary of the site between the proposed Child Care Centre and adjoining property), should not exceed 10 dB(A) above the background noise levels during the hours of operation of the Centre. The noise measurements are to be measured over a 15-minute period and are to be undertaken in accordance with the requirements of the NSW Department of Environment and Conservation (now OEH).

The SSROC discussion paper also noted that:

Noise from children playing was a common issue before the court. The court generally imposed a condition that noise not exceed background noise + 10dB.

In order to achieve this standard, several acoustic reports submitted to the court recommended that the time spent by children in the outdoor play areas be limited. Some consents limited outdoor play to 2 hours per half day.

A criterion of 'background + 10dB' for a total of two hours outdoor play time per day is recommended in Section 5 of Association of Australian Acoustical Consultants (AAAC) *Child Care Centre Noise Assessment Technical Guideline* (November 2009). The standard NPI criterion of 'background + 5dB' is applicable for other noise sources on the site.

The NPI default minimum background level (RBL) of 35dB(A), for the day period, will be adopted for this assessment.

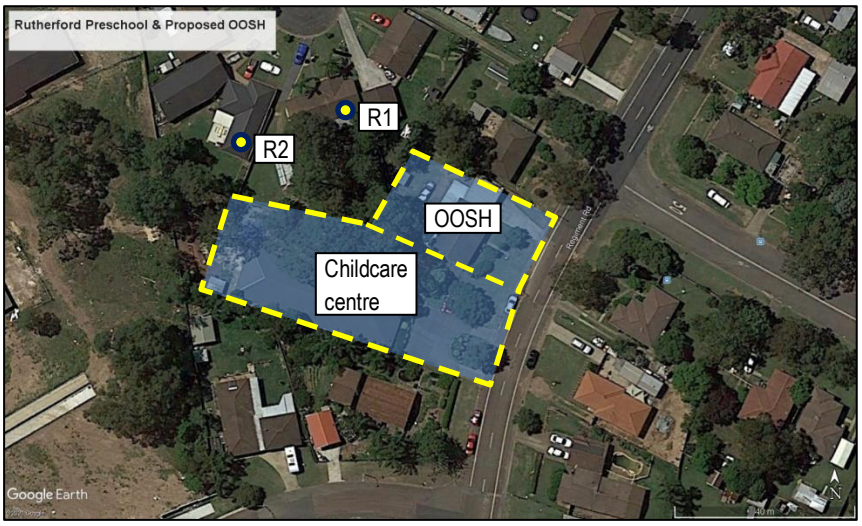

Figure 1. Project site and receivers

The receivers in Figure 1 are representative of the most impacted residences from the existing childcare centre, and the proposed OOSH facility, respectively. The proponent has indicated that the facility will operate from Monday to Friday, during the day period only.

In relation to determining noise goals for the operation of mechanical plant at the site the NPI sets out two separate sets of criteria designed to ensure developments meet environmental noise objectives. The first criteria account for intrusive noise and the others apply to the protection of amenity of particular land uses. A new development is assessed by applying both criteria to the situation and adopting the more stringent of the two.

Amenity criteria are dependent upon the nature of the receiver area and the existing level of industrial noise. The area is best described as "suburban" and, as current industrial noise is insignificant, the adopted criterion is equal to the recommended amenity limit for a suburban area minus 2 dB.

Table 2 below specifies the applicable base noise objectives for the operation of mechanical plant at the child care centre being assessed based on the NPI criterion.

TABLE 2
BASE NOISE LEVEL OBJECTIVES

Period	Intrusiveness trigger level* L_{eq} (15 min) dB(A)	Amenity trigger level** L_{eq} (15 min) dB(A)
Day	40	53

* Rating Background Level (RBL) + 5dB. RBL is the median value of each ABL (Assessment Background Level) over the entire monitoring period. The ABL is a single figure representing the "L_{90} of the $L_{90's}$" for each separate day of the monitoring period.
** Suburban zone Table 2.1 of NPI.

The project specific noise trigger level is therefore,

Day **40 dB(A) Leq (15 min)**

The daytime criterion will be conservatively adopted for the morning shoulder period, although due to the morning traffic peak, ambient levels are higher at this time. As per the discussion detailed above the noise from children in the outdoor play areas will be assessed against the shorter duration criterion of "background + plus 10" or;

Day **45 dB(A) Leq (15 min)**

3.3 Traffic Noise

Noise impacts from road traffic are assessed separately to site noise using the EPA Road Noise Policy (RNP).

The RNP, as adopted by Roads and Maritime Services (RMS) NSW, defers to the Infrastructure SEPP (2007) regarding traffic noise impacts on new developments. Provisions relevant to child care centres are included in Appendix C10 of the SEPP as follows:

> For new sensitive land use developments around existing busy roads in NSW, such as educational institutions, child care facilities, places of worship and hospitals, both suggested internal acoustic performance requirements and design principles are provided in **Section 3.6.1** of the interim guideline.
>
> The acoustic design advice in the guideline may be considered when designing such a development near any type of road.
>
> In certain circumstances, the Infrastructure SEPP imposes a requirement on councils to consider these guidelines before determining development applications for noise sensitive developments.

The DP&E "Development near rail corridors and busy roads – Interim guideline" supports the SEPP (2007) and provides internal noise criteria applicable to sensitive developments.

Table 3.1 of the Interim guideline is reproduced below.

Table 3.1: Noise criteria

Residential Buildings		
Type of occupancy	Noise Level dBA	Applicable time period
Sleeping areas (bedroom)	35	Night 10 pm to 7 am
Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40	At any time
Non-Residential Buildings		
Type of occupancy		Recommended Max Level dBA
Educational Institutions including child care centres		40
Places of Worship		40
Hospitals	- Wards	35
	- Other noise sensitive areas	45

Note: airborne noise is calculated as L_{eq} (9h) (night) and L_{eq} (15h)(day). Groundborne noise is calculated as L_{max} (slow) for 95% of rail pass-by events.

The AAAC advisory guideline recommends a maximum traffic noise impact of **55 dB(A),$L_{eq(1\ hour)}$** in outdoor play areas of child care centres. This level of noise is normally experienced within approximately 150m of major freeways or 80m from arterial roads. The subject site is 500 m from Racecourse Road with intervening buildings and over 900m from the New England Highway & Wollombi Road. In this suburban setting, traffic noise will be significantly less than 55 dB(A) and traffic noise impact will not require further assessment.

4.0 NOISE ASSESSMENT

4.1 External Play Areas

To assess potential noise impacts from the existing child care centre, noise levels were taken from the Spectrum Acoustics technical database. This contains measurements made at existing child care facilities that are similar in acoustic nature to the proposed child care centre.

The database contains noise measurements made in outdoor play areas as well as indoor areas. All sound levels have been measured with a

Bruel & Kjaer Type 2250 Precision Sound Level Analyser with calibration performed before and after the survey.

One set of outdoor measurements was made over a 15 minute interval during a morning activity session whilst 15 children aged up to 3 years old were in an outdoor playground. The measurements were made from the veranda of the facility at the end of the playground. The noise source (i.e. the children) was in motion about the area with an average distance of approximately 15m from the sound level meter.

Similar measurements were made over 15 minute intervals during a morning activity session whilst 15 children aged between about 2 and 6 years old were in an outdoor playground. Measurements were made near the ends of the playground, which had dimensions of approximately 5 x 15 m. The noise source (i.e. the children) was in motion about the area with an average distance of approximately 8m from the sound level meter.

Calculated Leq sound power levels based on the measured noise levels are shown below in **Table 4**. As can be seen the two measured levels are very similar and are equal to the levels stated in the AAAC Guideline.

TABLE 4
CALCULATED SOUND POWER LEVELS dB(A) Leq (15 min)

		Octave Band Centre Frequency (Hz)							
Source	dB(A)	63	125	250	500	1K	2K	4K	8K
15 x < 3 y.o.	88	61	69	77	81	84	81	74	64
15 x 2 to 6 y.o.	88	61	69	77	82	84	79	72	61

The proposal incorporates an additional indoor area and an outdoor play area. Potential noise issues arise primarily when children are engaged in outdoor play activities.

The assessment considers 15 of the proposed 20 additional children 2-6 year old to be in outdoor play areas, allowing for OOSH attendance and absenteeism.

Based on the proposed layout of the outdoor space, and the discussion above, it was assumed there would be one group of 15 children aged 2-6 distributed in **Figure 2** and indicated as S1. Children will access the play areas directly from the building. Only R1 will be impacted by this noise as other surrounding residences will be shielded by intervening structures.

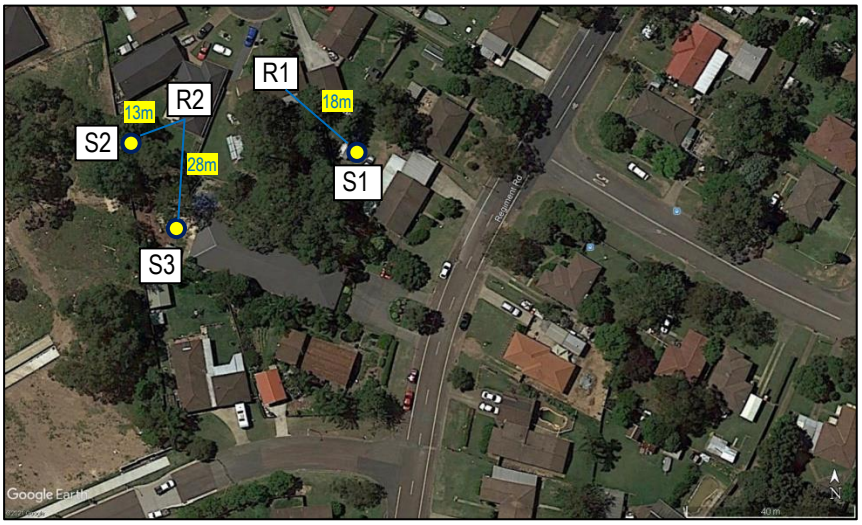

Figure 2. Site Layout, noise sources and nearest residences

The noise source was propagated to the receiver point, taking into account loss for distance.

The above noise levels in Table 4 are representative of a group of 15 children running and playing freely in an outdoor area. It is not common for such noise levels to be reached for children engaging in more static activities and the proposed OOSH outdoor play area is smaller than would permit activities like ball sports or running games. Therefore, a 10 dB noise reduction from the noise levels given in Table 4 will be adopted for the assessment of noise from the external play area.

The predicted received noise levels are then compared to the adopted noise goals to determine noise impacts. **Tables 5** and **6** shows the predicted noise levels at the nearest residences to the play areas of the proposed OOSH facility, and existing childcare centre, respectively.

TABLE 5
RECEIVED NOISE LEVEL AT R1

		Octave Band Centre Frequency, Hz							
Propagation Elements	**dB(A)**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Source Lw Leq (15 min)	78	51	59	67	71	74	71	64	54
S1 Distance loss (18 m)	-33	-33	-33	-33	-33	-33	-33	-33	-33
S1 Barrier Loss (1.5 m)		-5	-5	-5	-6	-6	-7	-8	-11
SPL at R1	**39**	**13**	**21**	**29**	**32**	**35**	**31**	**23**	**10**
Criterion (no time limit*)	**40**								
Criterion (2 hour / day)	**45**								

TABLE 6 RECEIVED NOISE LEVEL AT R2									
		Octave Band Centre Frequency, Hz							
Propagation Elements	**dB(A)**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Source Lw Leq (15 min)	78	51	59	67	71	74	71	64	54
S2 Distance loss (13 m)	-30	-30	-30	-30	-30	-30	-30	-30	-30
S3 Distance loss (28 m)	-37	-37	-37	-37	-37	-37	-37	-37	-37
S2 Barrier Loss (1.5 m)		-5	-5	-6	-6	-8	-9	-12	-15
S3 Barrier Loss (1.5 m)		-5	-5	-5	-5	-5	-6	-6	-7
S2 SPL at receiver R3	40	16	24	31	35	36	32	22	9
S3 SPL at receiver R3	36	9	17	25	29	32	28	21	10
SPL at R2	**42**	**17**	**25**	**32**	**36**	**38**	**34**	**25**	**13**
Criterion (no time limit*)	**40**								
Criterion (2 hour / day)	**45**								

* Daytime hours.

The predicted levels in Table 5 does not exceed the “background + 5 dB” criteria so children’s activities in the playground would not need to be restricted to a maximum of 2 hours per day. The predicted levels in Table 6 do exceed the “background + 5 dB” criteria so children’s activities would be restricted to a maximum of 2 hours per day.

4.2 Internal Activity Areas

The internal layout of the existing childcare centre, and proposed OOSH facility is shown in Figures 3 and 4, respectively. The internal spaces are at approximately the same distance from receivers R1 & R2 as play area sources S1 and S3 in Figure 2.

Allowing for 5 dB internal loss and the standard 10 dB loss through open doors, the noise from children inside activity rooms would be 15 dB lower than the noise from S1 and S3 in Figure 2. The noise impact from internal activities will therefore be significantly lower than the level from external play areas, which has been shown to comply with the noise criterion. This assessment applies to all noise generation in the activity areas including amplified music played through a small portable system for educational purposes.

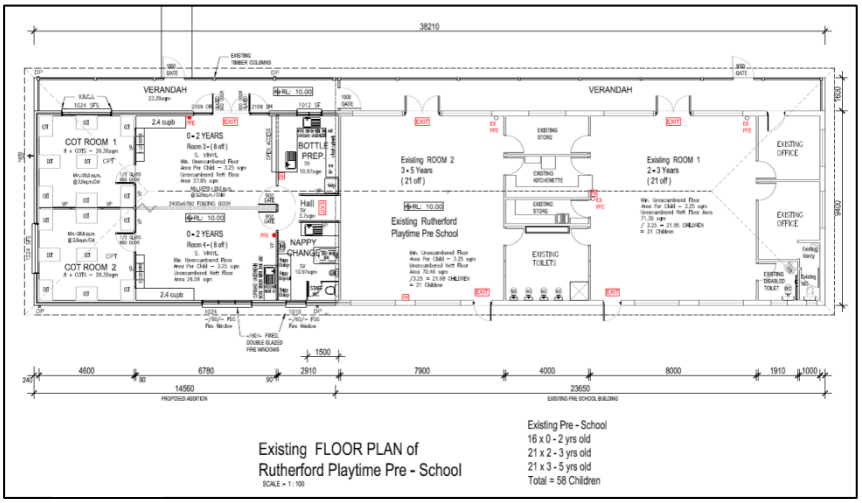

Figure 3. Existing Ground Floor Internal room layout – Childcare centre.

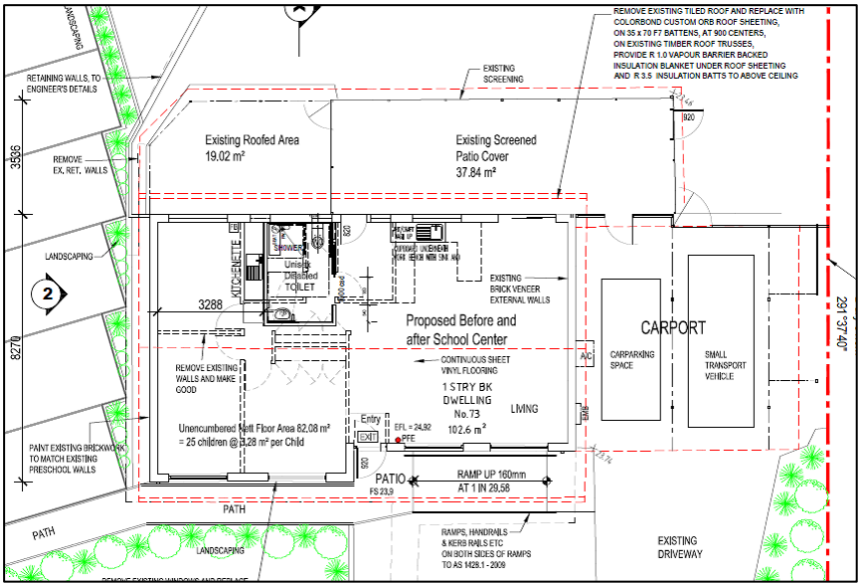

Figure 4. Proposed Ground Floor Internal room layout. – OOSH Facility

4.4 Car Park

There are additional proposed car parking spaces but these would be located centrally on the site, between the childcare and OOSH buildings, and therefore a full quantitative assessment of impacts on adjoining residences is not considered necessary.

5.0 CONCLUSION

An acoustical assessment of theoretical noise emissions has been carried out for the existing Rutherford Playtime Preschool at 73 Regiment Road, Rutherford, and proposed OOSH facility at the existing dwelling at 75 Regiment Road, Rutherford.

The noise impacts at the nearest residential receivers have been assessed, due to the operation of the child care centre and car park noise.

No exceedances of noise limits have been predicted for the proposed OOSH facility or existing childcare centre.

Based on these findings, we see no acoustic reason why the proposal should not be approved.

This report contains no appendices