HERRING STORER ACOUSTICS

PROPOSED CHILD CARE CENTRE
LOT 102 (#13) AND LOT 103 (#15) BEENYUP ROAD BYFORD

ENVIRONMENTAL ACOUSTIC ASSESSMENT

DECEMBER 2021

OUR REFERENCE: 28883-2-21201-02

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
P.O. Box 219, Como, W.A. 6952
(08) 9367 6200
hsa@hsacoustics.com.au

DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT

PROPOSED CHILD CARE CENTRE
BEENYUP ROAD; BYFORD

Job No: 21201-02

Document Reference: 28883-2-21201-02

FOR

HARLEY DYKSTRA

DOCUMENT INFORMATION			
Author:	Tim Reynolds	**Checked By:**	George Watts
Date of Issue :	21 December 2021		

REVISION HISTORY

Revision	Description	Date	Author	Checked
1	Correction for Residence to East (Not West)	15/02/2022	TR	-

DOCUMENT DISTRIBUTION

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CONTENTS

APPENDICIES

1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the amended layout for the proposed day care centre to be located at Lots 102 and 103 (Nos 13 and 15) Beenyup Road, Byford.

The report considers noise received at the neighbouring premises from the proposed development for compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997.* This report considers noise emissions from:

- Children playing within the outside play areas of the centre; and
- Mechanical services.

We note that from information received from DWER, the bitumised area would be considered as a road, thus noise relating to motor vehicles is exempt from the *Environmental Protection (Noise) Regulations 1997*. We note that these noise sources are rarely critical in the determination of compliance. However, as requested by council and for completeness, they have been included in the assessment, for information purposes only.

For information, a plan of the proposed development is attached in Appendix A.

2. SUMMARY

Noise received at the neighbouring premises from children playing in the outdoor areas would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*. However, it is noted that although the proposed facility would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, it is recommended that the air conditioning condensers be located centrally on the western façade. Additionally, it is recommended that mechanical services installed with low noise night modes.

It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors are not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources would with the fencing, as shown on the drawings attached in Appendix A and the restrictions in parking, as shown on Figure 5.2 in Section 5 comply with the Regulatory requirements, at all times.

Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation.

Notes:

1 For this development, the boundary fencing can be colourbond fencing. Fencing to the eastern boundary to be 1.8 metres high, with the northern boundary as shown on Figure 5.1 in Section 5 – Modelling.

2 Although the child care would be open before 7am, no outdoor play would be allowed until after 7am.

3 Air conditioning condensing unit to have night period low noise modes. Air conditioning condensers to be located centrally on the western façade.

4 The parking to be restricted during the night period, as shown on Figure 5.2 in Section 5 – Modelling.

3. CRITERIA

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels. For highly sensitive area of a noise sensitive premises this is determined by the calculation of an influencing factor, which is then added to the base levels shown below in Table 3.1. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. For other areas within a noise sensitive premises, the assigned noise levels are fixed throughout the day, as listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax(Slow)}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3 dB L_{AFast} or is more than 3 dB L_{AFast} in any one-third octave band;

(b) is present for more at least 10% of the representative assessment period; and

(c) is regular, cyclic and audible.

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

For this development, the closest neighbouring residences of concern to the proposed development, are located around the development. An aerial of the area and neighbouring residences are shown below as Figure 3.1.

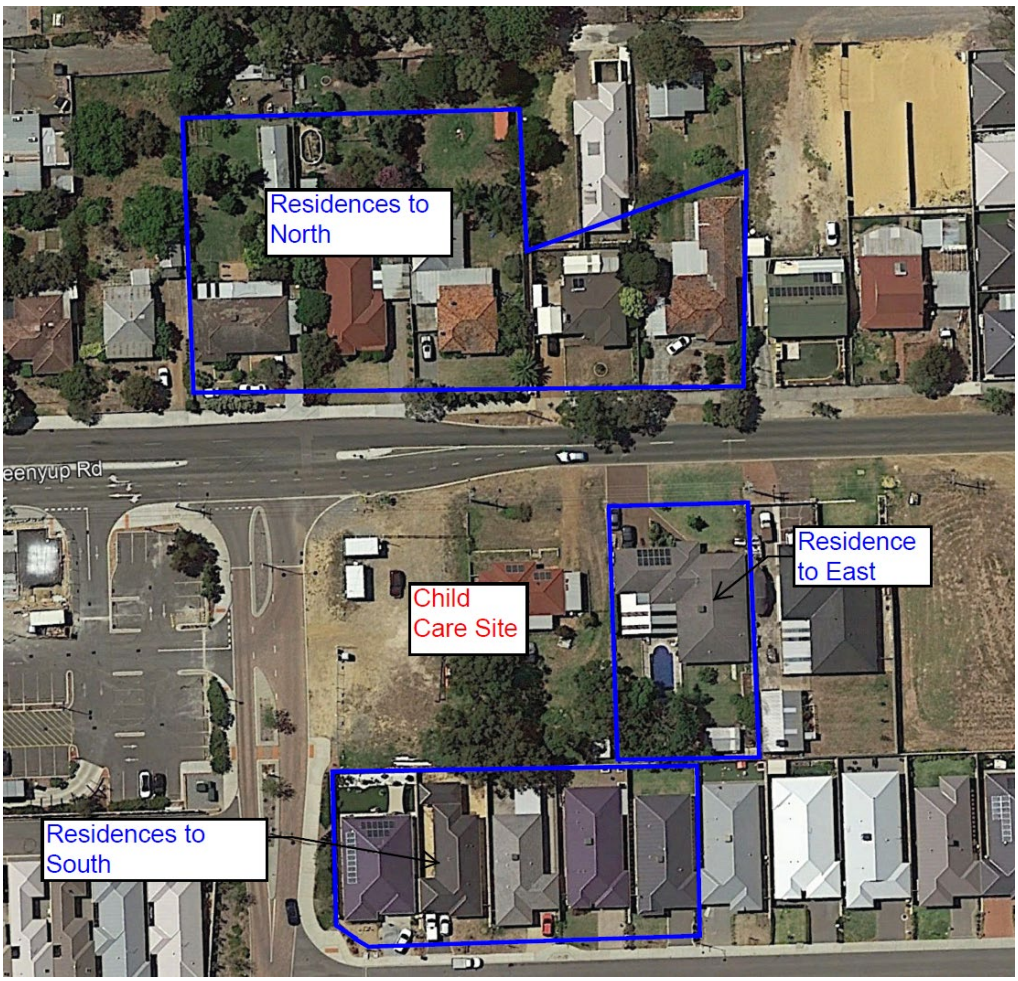


FIGURE 3.1 – NEIGHBOURING LOTS

At the neighbouring residences, as shown above, with the South Western Highway being a major road, the influencing factor has been determined to be +3 dB. Thus, the assigned noise levels would be as listed in Table 3.3.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	48	58	68
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	43	53	68
	1900 - 2200 hours all days (Evening)	43	53	58
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	38	48	58

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would be between 0630 and 1830 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 90 children: with the following breakdown:

Room 1	0 – 1 years	12 places
Room 2	1 – 2 years	13 places
Room 3	2 – 3 years	13 places
Room 4	2 – 3 years	18 places
Room 5	3 – 5 years	17 places
Room 6	3 – 5 years	17 places

It is noted that although the proposed child care centre would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am.

For reference, plans are attached in Appendix A.

5. MODELLING

To assess the noise received at the neighbouring premises from the proposed development, noise modelling was undertaken using the noise modelling program SoundPlan.

Calculations were carried out using the DWER's weather conditions, which relate to worst case noise propagation, as stated in the Department of Environment Regulation *"Draft Guidance on Environmental Noise for Prescribed Premises"*. These conditions include winds blowing from sources to the receiver(s).

Calculations were based on the sound power levels used in the calculations are listed in Table 5.1.

TABLE 5.1 – SOUND POWER LEVELS

Item	Sound Power Level, dB(A)
Children Playing	83 (per 10 children)
Car Moving in Car Park	79
Car Starting	85
Door Closing	87
Air conditioning condensing Unit	2 @ 74

Notes:

1 Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 70 children playing within the outdoor play areas at the one time, utilising 7 groups of 10 children, sound power levels distributed as plane sources. It is noted that the outdoor play noise associated with children under the age of 2 years is significantly less than for those over 3 years. Thus, given the breakdown of children, the assessment of 70 children would be considered conservative.

2 With regards to the air conditioning, we understand that the air conditioning has not been designed at this stage of the development. However, it is recommended that the condensing units be located centrally on the western façade, outside the Cot Room.

3 The noise level for the air conditioning has been based on the sound power levels used for previous assessment of child care centres. Although we understand that not all the air conditioning condensing units would be run before 7am, to provide flexibility all air conditioning units are to be installed with night period low noise modes. However, to be conservative, it has been assumed that all condensing units were operating before 7am.

4 Modelling has been existing fencings, with the eastern boundary fence being 1.8 metres high; and the fencing to the northern boundary to be as shown on Figure 5.1.

5 Modelling shows that noise received at the neighbouring residences from car doors closing would comply with the assigned noise level for the day period. However, to achieve compliance at the residences to the south (ie adjacent residences to the car park) during the night period (ie before 7am), the parking needs to be restricted, as shown on Figure 5.2.

6 Noise modelling was undertaken to a number of different receiver locations for each of the neighbouring residences. However, to simplify the assessment, only the noise level in the worst case location, as shown on Figure 3.1, have been listed.

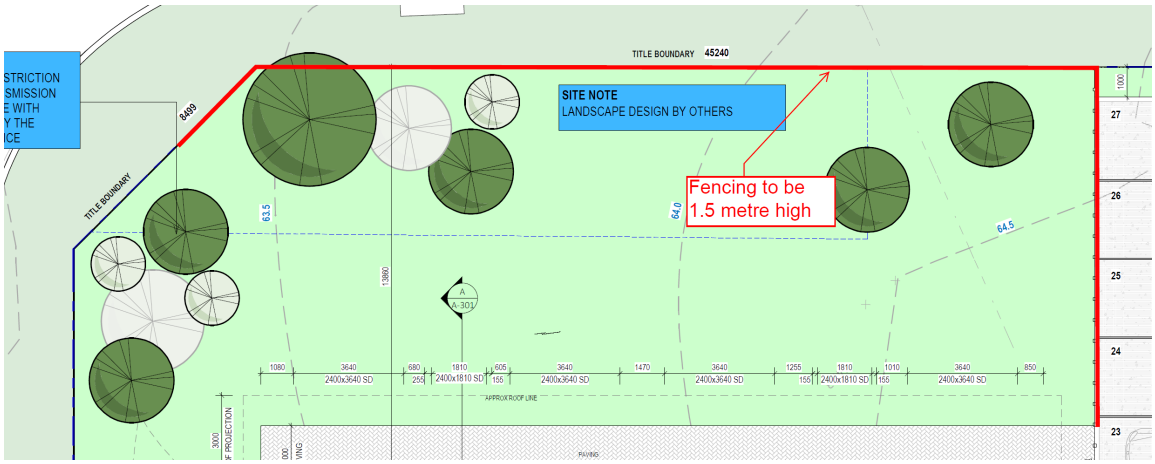


FIGURE 5.1 – NORTHERN BOUNDARY FENCE

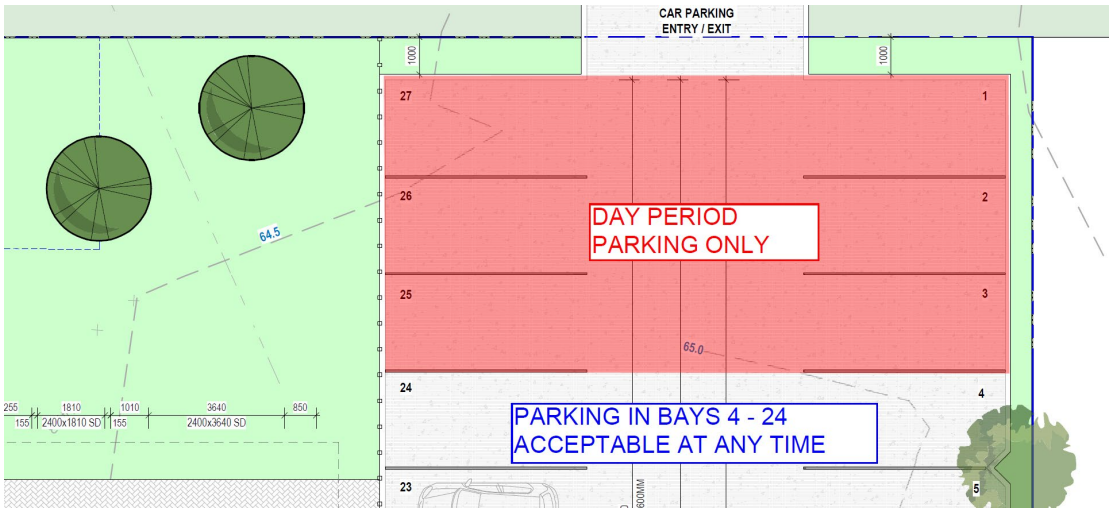


FIGURE 5.2 – PARKING RESTRICTIONS

6. ASSESSMENT

The resultant noise levels at the neighbouring residence from children playing outdoors and the mechanical services are tabulated in Table 6.1.

From previous measurements, noise emissions from children playing does not contain any annoying characteristics. Noise emissions from the mechanical services could be tonal and a +5 dB(A) penalty would be applicable, as shown in Table 6.1. Noise emissions from both outdoor play and the mechanical services needs to comply with the assigned L_{A10} noise levels.

TABLE 6.1 - ACOUSTIC MODELLING RESULTS FOR L_{A10} CRITERIA
OUTDOOR PLAY AREAS AND MECHANICAL PLANT

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Children Playing	Air Conditioning
North	46	30 (35)
East	42	11 (16)
South	44	30 (35)

( ) Includes +5 dB(A) penalty for tonality

With regards to noise associated with cars within the parking area, resultant noise levels are tabulated in Tables 6.2 and 6.3. It is noted that noise emissions from a moving car being an L_{A1} noise level, with noise emissions from cars starting and doors closing being an L_{Amax} noise level.

Based on the definitions of tonality, noise emissions from car movements and car starts, being an L_{A1} and L_{AMax} respectively, being present for less than 10% of the time, would not be considered tonal. Thus, no penalties would be applicable, and the assessment would be as listed in Table 6.2 (Car Moving) and Table 6.3 (Car Starting). However, noise emissions from car doors closing could be impulsive, hence the +10dB penalty has been included in the assessment.

TABLE 6.2 - ACOUSTIC MODELLING RESULTS L_{A1} CRITERIA
CAR MOVING

Neighbouring Premises	Calculated Noise Level (dB(A))
North	41
East	43
South	39

TABLE 6.3 - ACOUSTIC MODELLING RESULTS L_{Amax} CRITERIA
CAR STARTING / DOOR CLOSING

Neighbouring Premises	Calculated Noise Level (dB(A))			
	Car Starting		Door Closing	
	Day Period	Night Period	Day Period	Night Period
North	48	45	49 [59]	46 [56]
East	45	45	46 [56]	46 [56]
South	39	39	41 [51]	41 [51]

[ ] Includes +10 dB(A) penalty for impulsiveness.

Tables 6.4 to 6.10 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

TABLE 6.4 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS
OUTDOOR PLAY (DAY PERIOD)

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	46	48	Complies
East	42	48	Complies
South	44	48	Complies

TABLE 6.5 – ASSESSMENT OF L_{A10} NIGHT PERIOD NOISE LEVEL EMISSIONS
AIR CONDITIONING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	35	38	Complies
East	16	38	Complies
South	35	38	Complies

TABLE 6.6 – ASSESSMENT OF L_{A1} NIGHT PERIOD NOISE LEVEL EMISSIONS
CAR MOVEMENTS

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	41	48	Complies
East	43	48	Complies
South	39	48	Complies

TABLE 6.7 – ASSESSMENT OF L_{Amax} DAY PERIOD NOISE LEVEL EMISSIONS
CAR STARTING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	48	68	Complies
East	45	68	Complies
South	39	68	Complies

TABLE 6.8 – ASSESSMENT OF L_{Amax} NIGHT PERIOD NOISE LEVEL EMISSIONS
CAR STARTING

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	45	58	Complies
East	45	58	Complies
South	39	58	Complies

TABLE 6.9 – ASSESSMENT OF L_{Amax} DAY PERIOD NOISE LEVEL EMISSIONS
CAR DOOR

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	59	68	Complies
East	56	68	Complies
South	51	68	Complies

TABLE 6.10 – ASSESSMENT OF L_{Amax} NIGHT PERIOD NOISE LEVEL EMISSIONS
CAR DOOR

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	56	58	Complies
East	56	58	Complies
South	51	58	Complies

7. CONCLUSION

Noise received the neighbouring residences from the outdoor play area would comply with day period assigned noise level, with the existing fencing, the eastern boundary fence being 1800mm high and a fence to the northern boundary, as shown on Figure 5.1.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, it is recommended that the air conditioning condensers be located on the western façade. Additionally, it is recommended that mechanical services design be reviewed for compliance with the Regulatory requirements.

It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors are not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources also complies with the Regulatory requirements at all times with the parking restriction, as shown on Figure 5.2 in Section 5 – Modelling.

Thus, noise emissions from the proposed development, would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, with the inclusion of the mitigation as outlined above.

Notes:

1 For this development, the boundary fencing can be colourbond fencing. Fencing to the eastern boundary to be 1.8 metres high, with the northern boundary as shown on Figure 5.1 in Section 5 – Modelling.

2 Although the child care would be open before 7am, no outdoor play would be allowed until after 7am.

3 Air conditioning condensing unit to have night period low noise modes. Air conditioning condensers to be located centrally on the western façade.

4 The parking to be restricted during the night period, as shown on Figure 5.2 in Section 5 – Modelling.

APPENDIX A

PLANS

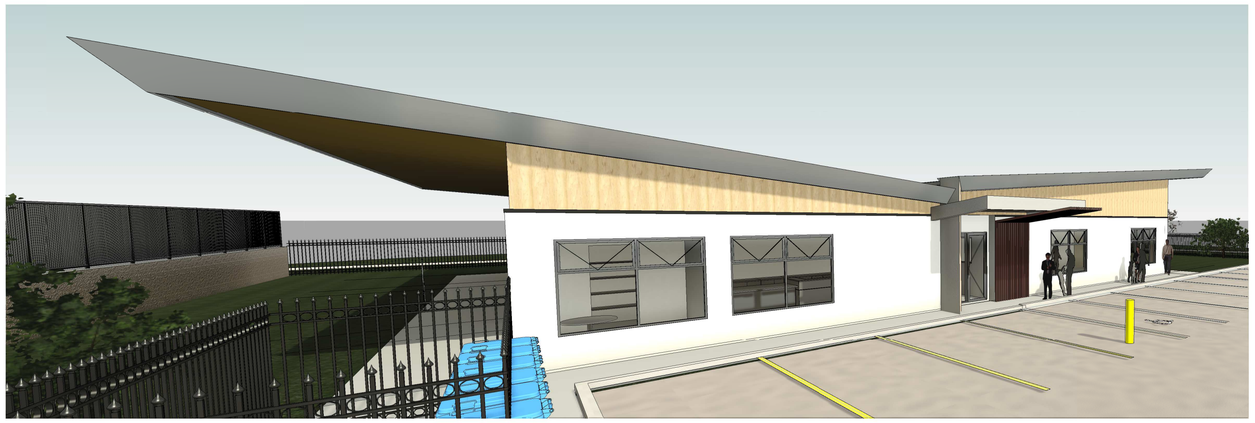
ISSUE	REV	DESCRIPTION	DATE
	1A	ISSUE FOR DA	20.12.2021

BEENYUP ROAD CHILDCARE

13 BEENYUP ROAD
BYFORD WA 6122

SHEET LIST

Sheet Number	Sheet Name	Current Revision Description	Current Revision	Current Revision Date	Drawn By	Checked By
A-001	COVER SHEET	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-015	SITE PLAN EXISTING / DEMOLITION	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-021	PROPOSED SITE PLAN / GROUND FLOOR	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-031	PERSPECTIVE	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-032	ISOMETRIC VIEWS	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-102	ROOF PLAN	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-201	EXTERNAL ELEVATIONS	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-210	EXTERNAL ELEVATION MATERIALS PALETTE	ISSUE FOR DA	1A	20.12.2021	AA	HL
A-301	SECTIONS	ISSUE FOR DA	1A	20.12.2021	AA	HL



SHEET STATUS:
ISSUE FOR DA

NOTES:

1. ALL DIMENSIONS SUBJECT TO ON SITE VERIFICATION PRIOR TO EXECUTION OF WORK
2. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALING
3. THE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION AND ASSOCIATED DRAWINGS.

DESIGNER

actus associates

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CLIENT
CARMEL GROUP

PROJECT
BEENYUP ROAD CHILDCARE
13/15 BEENYUP ROAD
BYFORD WA 6122

DRAWING TITLE
COVER SHEET

DRAWN	DESIGN	SCALE @ A1
AA	AA	
DATE	**PROJECT NUMBER**	
09/12/2021	21-053	
DRAWING NUMBER		**ISSUE**
A-001		**A**

ISSUE	REV	DESCRIPTION	DATE
1A		ISSUE FOR DA	20.12.2021

SITE LEGEND:

ELEVATION / SECTION REFERENCE WITH ASSOCIATED DRAWING NUMBER

SITE BOUNDARY

LANDSCAPED AREA

SITE NOTES:

1. NEW CAR BAYS TO BE MARKED USING APPROVED ROAD MARKING PAINT

ACCESSIBLE (DISABLED) CAR PARKING REQUIREMENTS:
ALL NEW WORKS TO COMPLY WITH CURRENT RELEVANT AUSTRALIAN STANDARDS INCLUDING BUT NOT LIMITED TO:

- AS 2890.6-2009 - OFF STREET PARKING FOR PEOPLE WITH DISBILITIES
- AS 1428.4-2009 - MEANS TO ASSIST THE ORIENTATION OF PEOPLE WITH VISION IMPAIRMENT - TACTILE GROUND SURFACE INDICATORS
- AS1428.1-2009 - GENERAL REQUIREMENTS FOR ACCESS - NEW BUILDING WORKS

SITE ANALYSIS TABLE

TOTAL SITE AREA	2339.4 SQM	100%
TOTAL BUILDING AREA	619.9 SQM	26.4%
TOTAL CAR PARKING AREA	620 SQM	26.5%
TOTAL SOFT LANDSCAPE AREA	896.5 SQM	38.3%
TOTAL HARD LANDSCAPE AREA	180 SQM	7.7%
TOTAL LANDSCAPE AREA	**1046.4 SQM**	**46.7%**
EXTERNAL PLAY AREA 1	451.9 SQM	
EXTERNAL PLAY AREA 2	508.9 SQM	
TOTAL PLAY AREA	**960.8 SQM**	

SHEET STATUS:
ISSUE FOR DA

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13/15 BEENYUP ROAD
BYFORD WA 6122

DRAWING TITLE
PROPOSED SITE PLAN / GROUND FLOOR

DRAWN	DESIGN	SCALE @ A1
AA	AA	1 : 100
DATE	**PROJECT NUMBER**	
09/12/2021	21-053	
DRAWING NUMBER		**ISSUE**
A-021		A

ISSUE	REV	DESCRIPTION	DATE
	1A	ISSUE FOR DA	20.12.2021

BEENYUP ROAD

DUNDATHA DRIVE

TITLE BOUNDARY 45240

TITLE BOUNDARY

8.499

TITLE BOUNDARY 39990

5800

1000

1000

2600

38800

CUSTOM ANGLED FASCIA

3000

LINE OF BUILDING BELOW

SHADE SAIL

12583

ROOF SHEET AT 5° PITCH FALLS

1700

ROOF SHEET AT 6° PITCH FALLS

1644

ROOF SHEET AT 1° PITCH FALL

ROOF SHEET AT 1° PITCH FALL

SHADE SAIL

ROOF SHEET AT 5° PITCH FALLS

3913

LINE OF BUILDING BELOW

3000

CUSTOM ANGLED FASCIA

TITLE BOUNDARY 46000

KERB

5900

63.5

51250 TITLE BOUNDARY

64.0

64.5

SHEET STATUS:
ISSUE FOR DA

NOTES:

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PROJECT
BEENYUP ROAD CHILDCARE
13/15 BEENYUP ROAD
BYFORD WA 6122

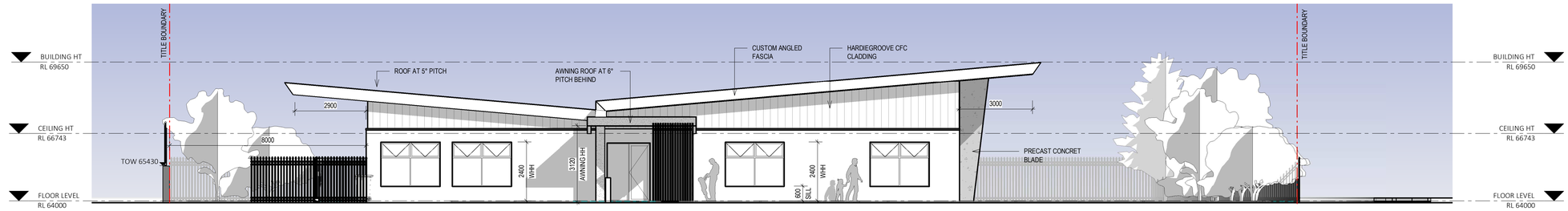
DRAWING TITLE
ROOF PLAN

DRAWN	DESIGN	SCALE @ A1
AA	AG / SG	1 : 100
DATE	**PROJECT NUMBER**	
09/12/2021	21-053	

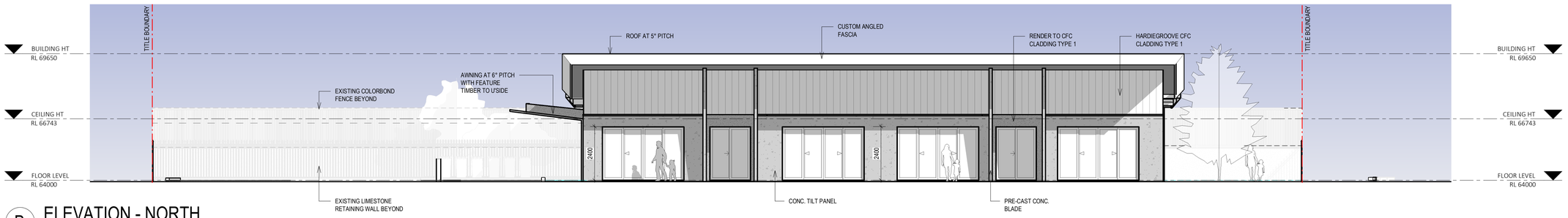
DRAWING NUMBER A-102

ISSUE A

ISSUE	REV	DESCRIPTION	DATE
	1A	ISSUE FOR DA	20.12.2021



A ELEVATION - EAST
1 : 100



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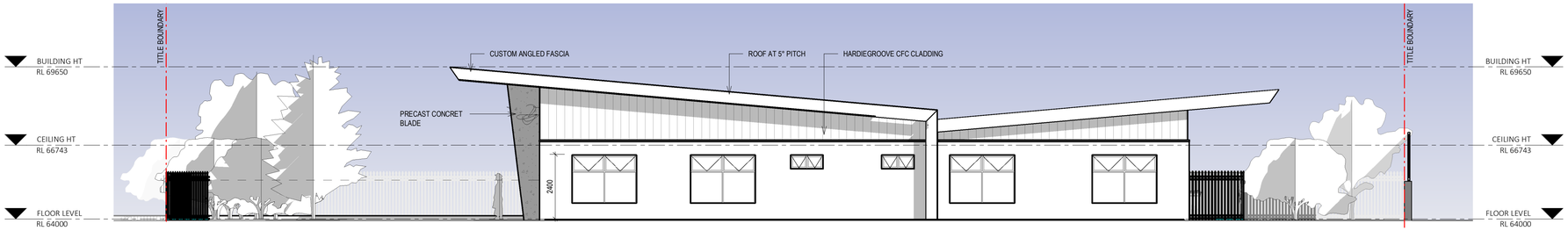

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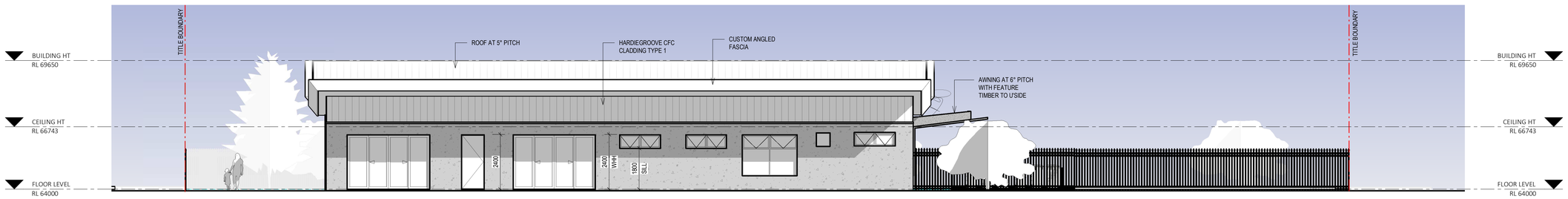

D ELEVATION - SOUTH
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SHEET STATUS:
ISSUE FOR DA

NOTES:

1. ALL DIMENSIONS SUBJECT TO ON SITE VERIFICATION PRIOR TO EXECUTION OF WORK
2. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALING
3. THE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION AND ASSOCIATED DRAWINGS.

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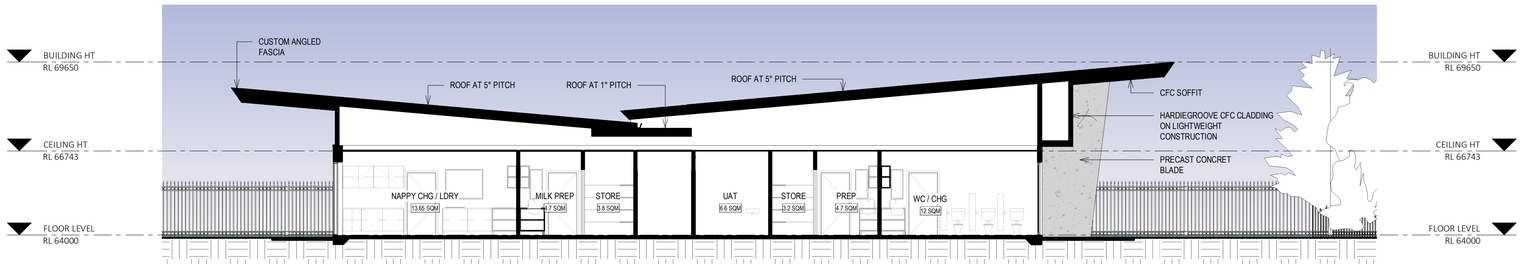
PROJECT
BEENYUP ROAD CHILDCARE
13/15 BEENYUP ROAD
BYFORD WA 6122

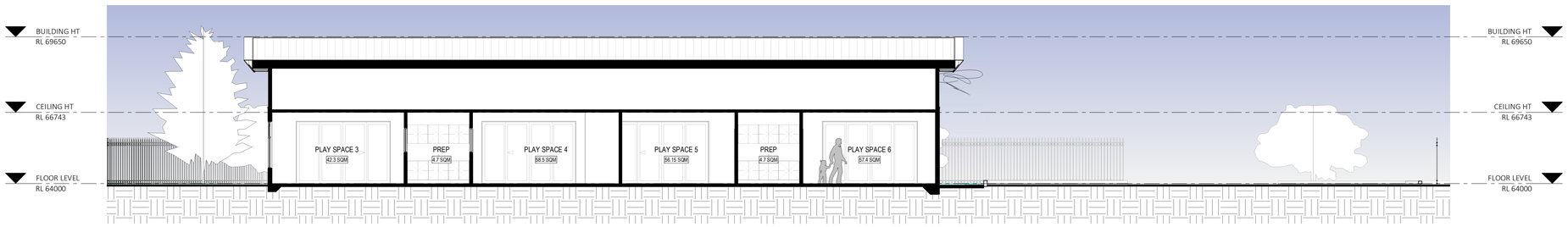
DRAWING TITLE
EXTERNAL ELEVATIONS

DRAWN	DESIGN	SCALE @ A1
AA	AA	1 : 100
DATE	**PROJECT NUMBER**	
09/12/2021	21-053	
DRAWING NUMBER		**ISSUE**
A-201		**A**

ISSUE	REV	DESCRIPTION	DATE
1A		ISSUE FOR DA	20.12.2021



A SECTION A
1 : 100



B SECTION B
1 : 100

SHEET STATUS:
ISSUE FOR DA

NOTES:

1. ALL DIMENSIONS SUBJECT TO ON SITE VERIFICATION PRIOR TO EXECUTION OF WORK
2. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALING
3. THE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION AND ASSOCIATED DRAWINGS.

DESIGNER
actus associates
www.actus.net.au

CLIENT
CARMEL GROUP

PROJECT
BEENYUP ROAD CHILDCARE
13/15 BEENYUP ROAD
BYFORD WA 6122

DRAWING TITLE
SECTIONS

DRAWN	DESIGN	SCALE @ A1
AA	AA	1 : 100
DATE	**PROJECT NUMBER**	
09/12/2021	21-053	
DRAWING NUMBER		**ISSUE**
A-301		**A**