

**PROPOSED CHILD CARE CENTRE
10 HARBOUR ELBOW
BANKSIA GROVE**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

MAY 2018

OUR REFERENCE: 23079-1-18086

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PROPOSED CHILD CARE CENTRE
10 HARBOUR ELBOW, BANKSIA GROVE

Job No: 18086

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FOR

THE ATLANTIS GROUP

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by The Atlantis Group to undertake an acoustic assessment of noise emissions associated with the proposed child care centre located at 10 Harbour Elbow, Banksia Grove.

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 child care centre; and
- Mechanical services.

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

2. SUMMARY

We understand that it is proposed that the proposed child care centre would only operate between 7:00am and 7:00pm, Monday to Friday and would cater for up to 120 children.

Noise received at the neighbouring premises from children playing in the outdoor areas would, with the inclusion of the 1.8 metre high fences to the northern and southern boundaries, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the proposed hours of operation.

Noise from the mechanical services has been assessed to also comply with the relevant assigned noise levels.

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.

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.

Under the Regulations, an highly sensitive area means that area (if any) of noise sensitive premises comprising –

- (a) A building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) Any other part of the premises within 15 m of that building or that part of the building.

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 are located around the proposed development, as shown on Figure 01.



Figure 01 – Neighbouring Premises

At the neighbouring residence, the influencing factor has been determined to be 0dB. 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)	45	55	65
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40	50	65
	1900 - 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35	45	55
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.

4. PROPOSAL

From information supplied, we understand that the child care centre normal hours of operations would be between 0700 and 1900 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 120 children, with the following breakdown of children :

Babies / Nursery	-	40
Toddlers	-	40
Kindy	-	40

A sketch of the proposed floor plan is attached in Appendix A for information.

As part of the development, 1.8 metre high boundary fences will be installed along the northern and southern boundaries.

The air conditioning units will be located on the roof of the child care centre, as shown in Figure 02.

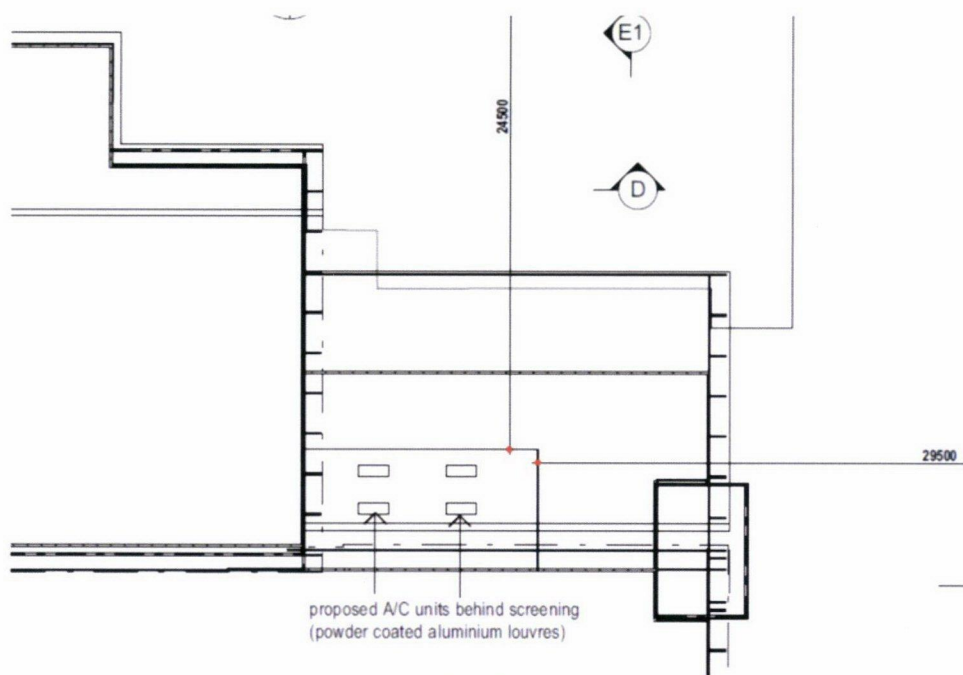


Figure 02 – Location of Air Conditioning Condensing Units

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 DER standard weather conditions as stated in the Department of Environment Regulation *"Draft Guidance on Environmental Noise for Prescribed Premises"*.

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)
Air conditioning condensing Unit	4 @ 72

6. ASSESSMENT

Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 40 children playing outside within the outdoor play areas at the one time, utilising 4 groups of 10 children sound power levels distributed as plane sources. The resultant noise levels at the neighbouring residence from children playing outdoors are tabulated in Table 6.1.

The resultant noise levels from the air conditioning at the neighbouring residence are also listed in Table 6.1.

From previous measurements, noise emissions from children playing is a broadband noise and does not contain any annoying characteristics. Noise emissions from the mechanical services would be tonal and a +5 dB(A) penalty would be applied, as shown in Table 6.1.

**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
R1	43	29(34)
R2	36	22(27)
R3	44	28(33)
R4	45	19(24)
R5	45	19(24)
R6	45	18(23)

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

Tables 6.2 and 6.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.2 – 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
R1	43	45	Complies
R2	36	45	Complies
R3	44	45	Complies
R4	45	45	Complies
R5	45	45	Complies
R6	45	45	Complies

**TABLE 6.3 – ASSESSMENT OF L_{A10} DAY PERIOD NOISE LEVEL EMISSIONS
ALL AIR CONDITIONING**

Location	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1	34	45	Complies
R2	27	45	Complies
R3	33	45	Complies
R4	24	45	Complies
R5	24	45	Complies
R6	23	45	Complies

7. CONCLUSION

It is proposed that the proposed child care centre would only operate between 7am and 7pm, Monday to Friday (excluding Public Holidays) and would cater for up to 120 children, including 40 babies / nursery.

Noise received at the neighbouring residential premises from children playing in the outdoor play area would, with the inclusion of the 1.8 metre high fences to the northern and southern boundaries, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed operating hours.

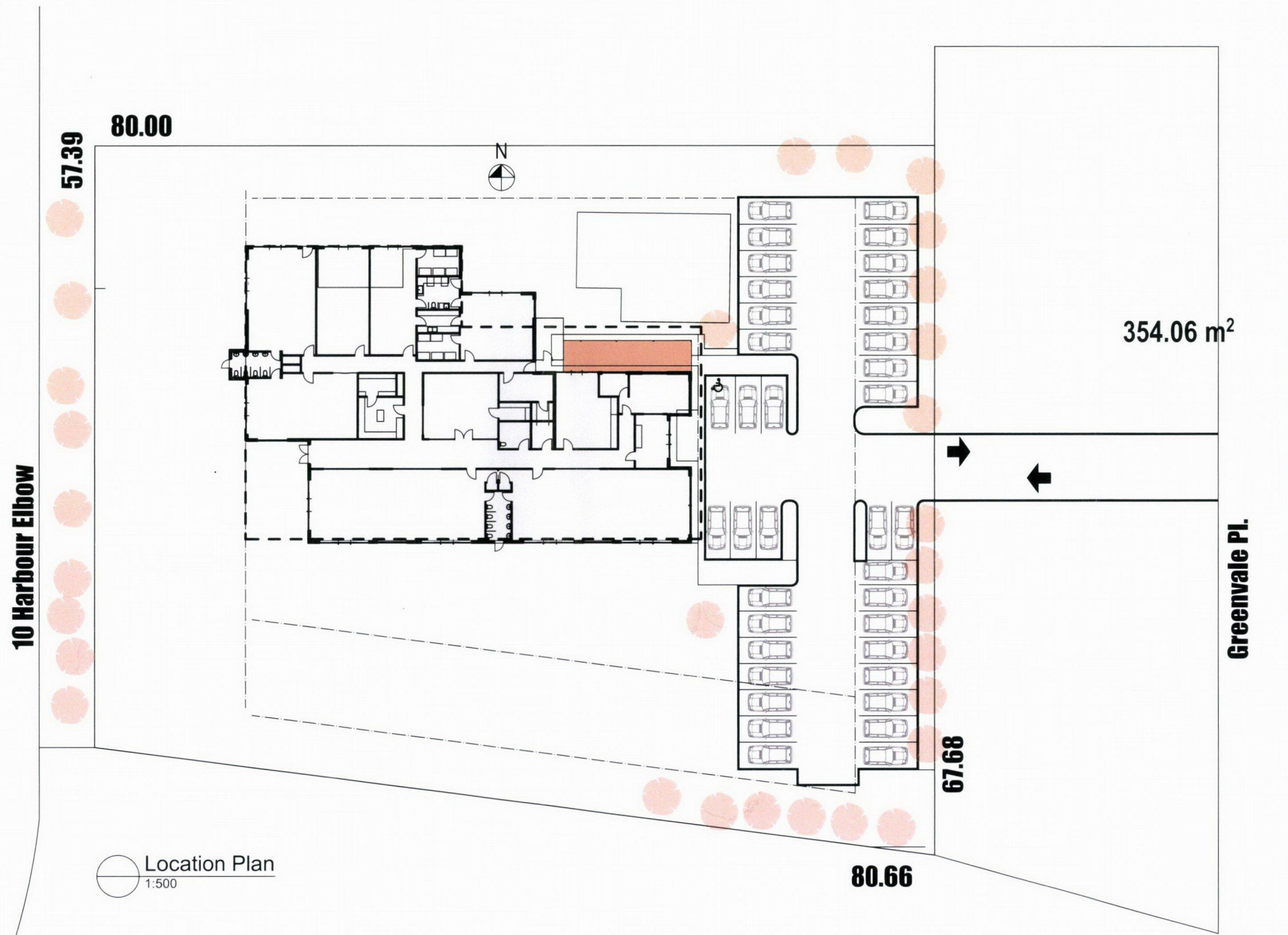
Noise from the mechanical services has also been assessed to comply with the relevant criteria.

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.

APPENDIX A

PLANS

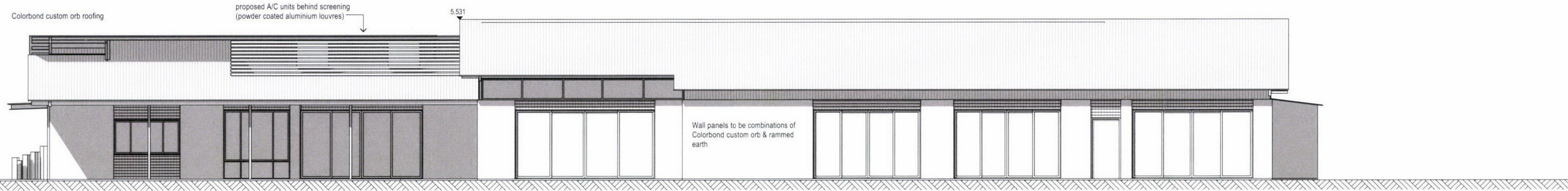
- Building Envelope**
923.98 m²
- Verandah Areas**
36.79 m²



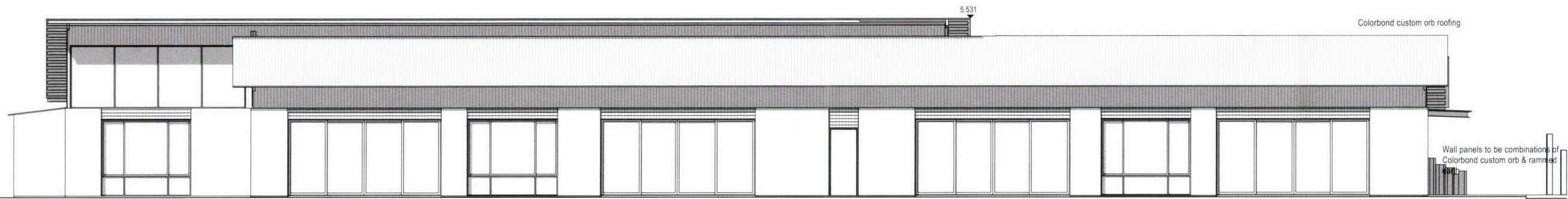
Location Plan
1:500

1	Information	20/2/2018
REV.	AMENDMENT	DATE

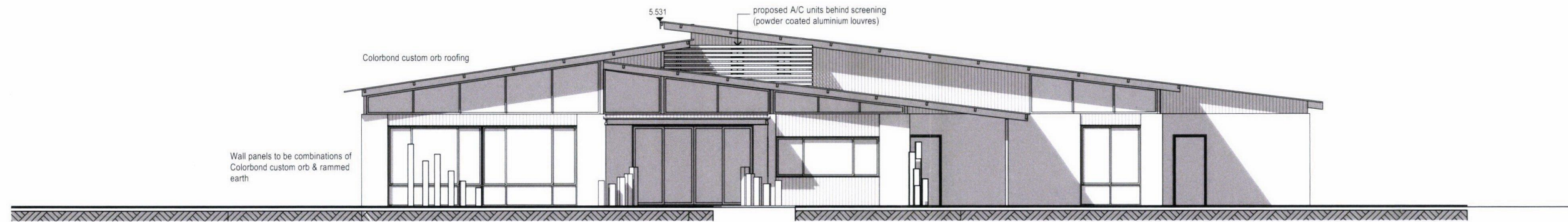
Date:	7/04/2018	Drwn:	JC
Job No:	1702	Dwg No.:	A00
		Rev	1
The builder must verify all dimensions on site before commencing any work or shop dwgs.			



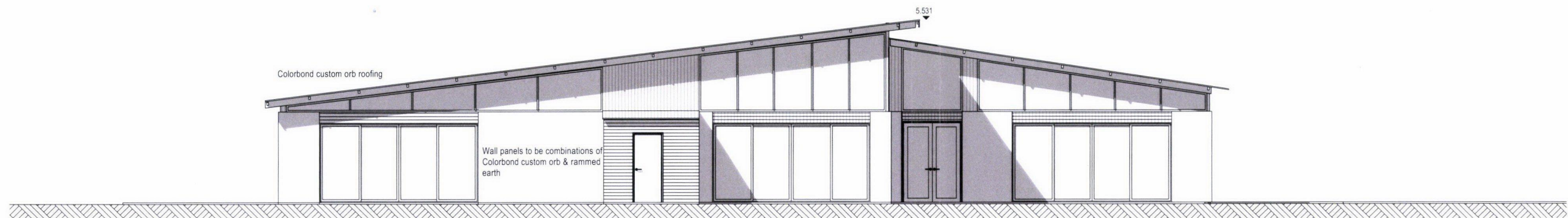
north
1:100



south
1:100



east
1:100



west
1:100

<p>john chisholm design BUILDING DESIGN & VISUALISATION t: 9339 2224 m: 0408 833 399 jc@johnchisholm.com www.johnchisholm.com</p>	<p>NATIONAL ASSOCIATION OF BUILDING DESIGNERS BUILDING DESIGNERS ASSOCIATION OF WESTERN AUSTRALIA INC</p>	<p>Project Childcare Centre 10 Harbour Elb. Banksia Grove</p>	<p>Drawing Proposed Elevations</p>	Date	4/05/2018	Drawn	JC	
				Job No.	1702	Dwg No.	A301	
				Issue	Issued for information	4/5/2018	Rev	B
				Issue	Issued for planning	20/4/2018		
	REV	AMENDMENT	DATE					

APPENDIX 5 – BUSHFIRE REPORT (BUSHFIRE SAFETY CONSULTING PTY LTD)