PROPOSED CHILD CARE CENTRE
38 POINT WALTER ROAD
BICTON

ENVIRONMENTAL ACOUSTIC ASSESSMENT

JULY 2022

OUR REFERENCE: 29799-1-22073-02

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DOCUMENT CONTROL PAGE

ENVIRONMENTAL ACOUSTIC ASSESSMENT

PROPOSED CHILD CARE CENTRE
POINT WALTER ROAD, BICTON

Job No: 22073-02

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FOR

MW URBAN

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APPENDICIES

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1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the proposed day care centre to be located at 38 Point Walter Road, Bicton.

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 the outdoor play areas would comply with the requirements of the *Environmental Protections (Noise) Regulations 1997*, provided outdoor play is limited to the day period (ie after 7am), with the inclusion of the boundary fencing as shown on Figure 5.2 in Section 5 – Modelling.

Noise from the mechanical services has also been assessed to comply with the relevant criteria, provided they are located as shown on Figure 5.1 in Section 5 – Modelling; and they are installed with “night” period quiet modes. However, as the assessment has not been based on the mechanical services design, it is recommended that additionally, the final 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 is not strictly exempt from the Regulations. Noise received at the existing neighbouring residences from these noise sources would with the proposed fencing, as shown in 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, with the inclusion of the following:

1 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. Thus, noise received at the neighbouring existing residences from the outdoor play area needs to comply with the assigned day period noise level.

2 Fencing to the development to be as shown in Figure 5.2 in Section 5 - Modelling. It is noted that for a child care centre, colourbond is an acceptable fencing material.

3 It is recommended that the air conditioning condensing units are located as shown on Figure 5.1 in Section 5 – Modelling; and they are installed with "night" period quiet modes. Additionally, it is recommended that an assessment of the mechanical services design be undertaken to ensure compliance with the regulations.

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, a 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 neighbouring noise sensitive premises are as shown on Figure 3.1.

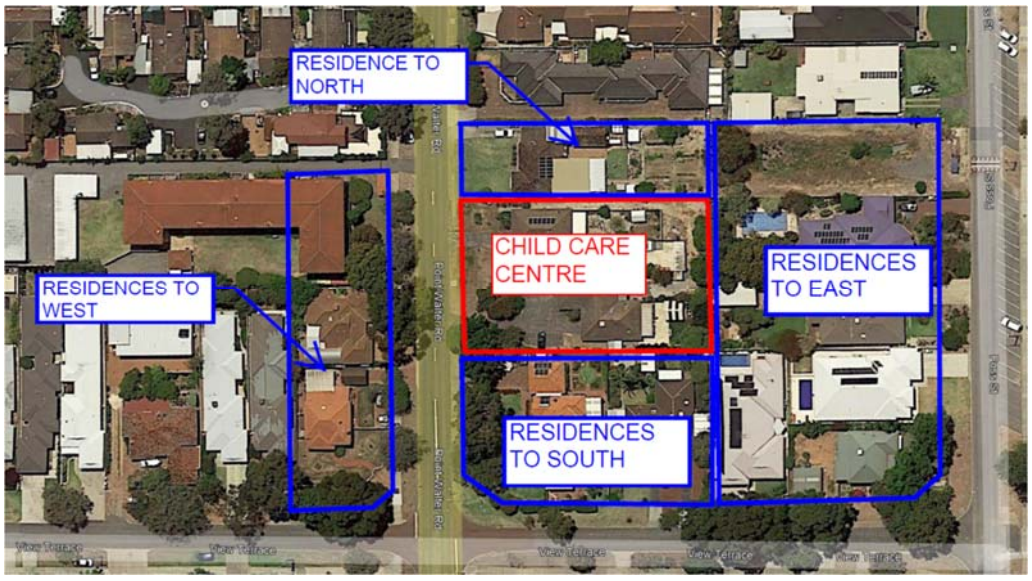

FIGURE 3.1 – NEIGHBOURING LOTS

At the neighbouring residences, with Canning Highway being a major road within the outer 450 metre circle, the Influencing Factor for the neighbouring residences would be +2 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)	47	57	67
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	42	52	67
	1900 - 2200 hours all days (Evening)	42	52	57
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	37	47	57

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 83 children: with the following breakdown:

Activity 1	4 - 5 years	20 places
Activity 2	3 - 4 years	20 places
Activity 3	2 - 3 years	15 places
Activity 4	1 – 2 years	16 places
Activity 5	0 – 1 years	12 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.

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	4 @ 73

Notes:

1 Given the number and breakdown of children, noting that the noise emissions from children under the age of 2 years is significantly reduced, acoustic modelling of outdoor play noise was made, based on 80 children playing, as outlined below, within the outdoor play areas at the one time, distributed as plane sources:

Front (Western) Outdoor Play Area	-	20 children.
Rear (Eastern) Outdoor Play Area	-	60 children.

2 Within the noise model, the children (ie noise source) were placed at 1 metre above ground level.

3 The noise level for the air conditioning has been based on the sound power levels used for previous assessment of child care centres. From other studies, we understand that the noise associated with the condensing units would be conservative.

4 For this development, it is recommended that the play equipment stores be moved marginally to the north and 50% air conditioning condensing units be located on the southern side of each of stores (in the alcove created), as indicated on Figure 5.1.

5 The noise modelling has been based on the fencing indicted on the Figure 5.2.

6 The 3 storey apartment building located to the west, across Point Walter Road has been noted and included in the noise model and assessment.

7 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 (ie highest noise level), have been listed.

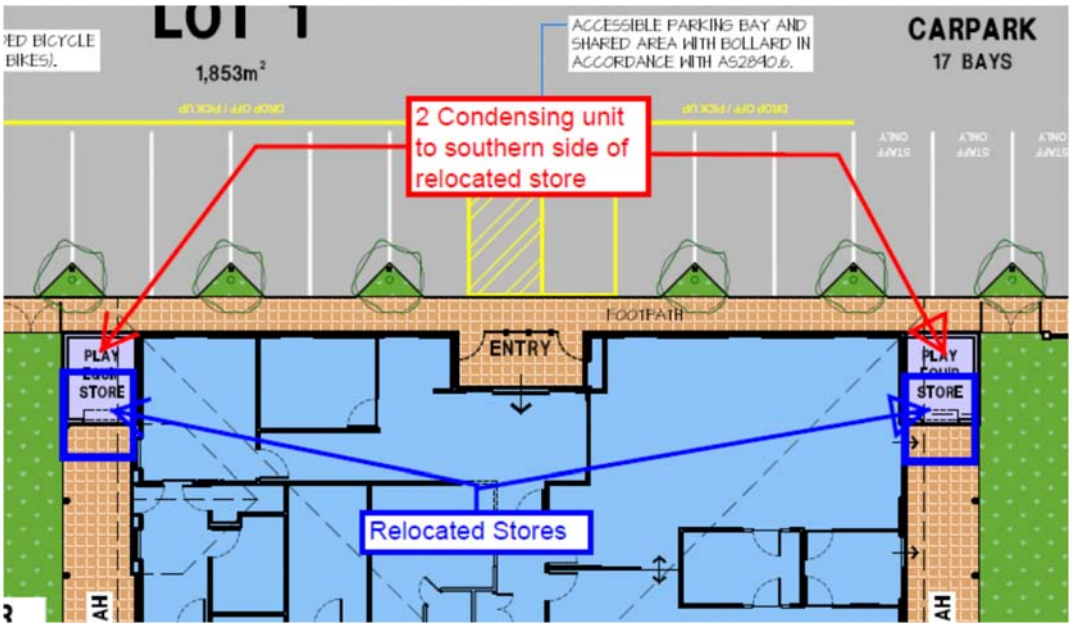

FIGURE 5.1 – LOCATION OF CONDENSING UNITS

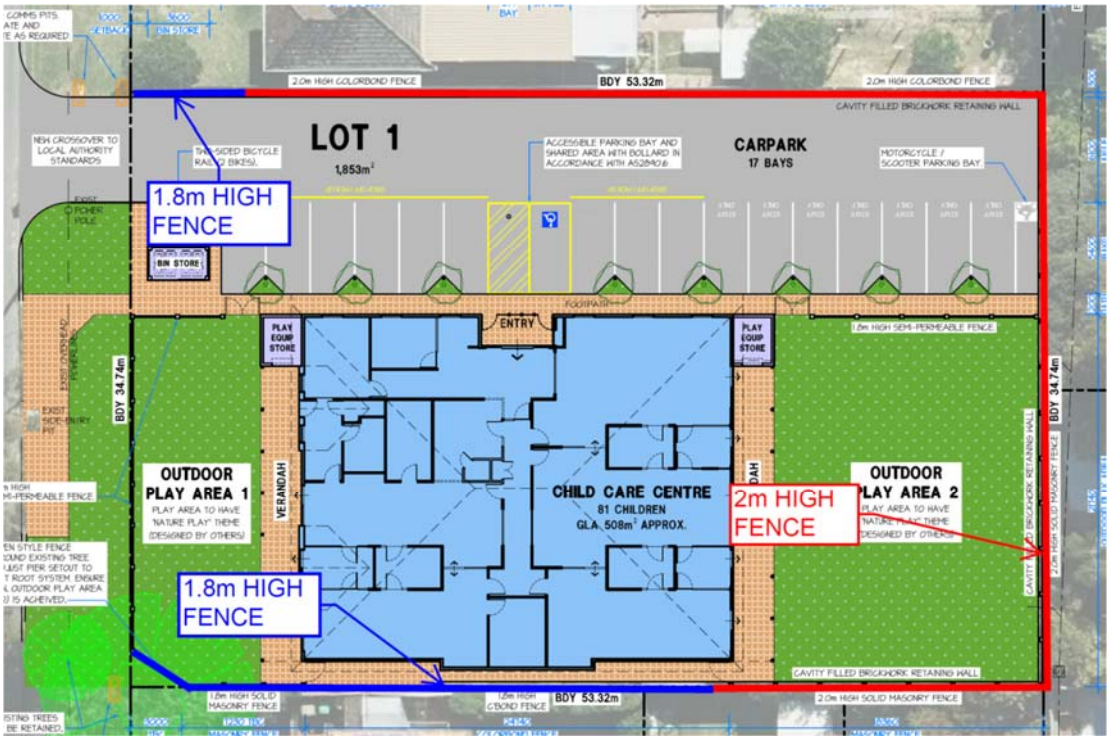

FIGURE 5.2 – BOUNDARY FENCING

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	
		Day Period	Night Period
East	47	28 (33)	22 (27)
North	45	38 (43)	32 (37)
West	47	30 (35)	24 (29)
South	46	29 (34)	23 (28)

( ) 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))
East	40
North	43
West	40
South	42

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

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Car Starting	Door Closing
East	43	45 [55]
North	45	47 [57]
West	44	45 [55]
South	45	47 [57]

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

Tables 6.4 to 6.9 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
East	47	47	Complies
North	45	47	Complies
West	47	47	Complies
South	46	47	Complies

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

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
East	33	47	Complies
North	43	47	Complies
West	35	47	Complies
South	34	47	Complies

TABLE 6.6 – 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
East	27	37	Complies
North	37	37	Complies
West	29	37	Complies
South	28	37	Complies

TABLE 6.7 – 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
East	40	47	Complies
North	43	47	Complies
West	40	47	Complies
South	42	47	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
East	43	57	Complies
North	45	57	Complies
West	44	57	Complies
South	45	57	Complies

TABLE 6.9 – 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
East	55	57	Complies
North	57	57	Complies
West	55	57	Complies
South	57	57	Complies

7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level with the boundary fencing, as shown on Figure 5.2 in Section 5 – Modelling.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided they are located as shown on Figure 5.1 in Section 5 – Modelling; and they are installed with "night" period quiet modes. However, as the assessment has not been based on the mechanical services design, it is recommended that additionally, the final 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 premises from these noise sources would also 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, with the inclusion of the following:

1 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. Thus, noise received at the neighbouring existing residences from the outdoor play area needs to comply with the assigned day period noise level.

2 Fencing to the development to be as shown on Figure 5.2 in Section 5 - Modelling. It is noted that for a child care centre, colourbond is an acceptable fencing material.

3 It is recommended that the air conditioning condensing units are located as shown on Figure 5.1 in Section 5 – Modelling; and they are installed with “night” period quiet modes. Additionally, it is recommended that an assessment of the mechanical services design be undertaken to ensure compliance with the regulations.

APPENDIX A

PLANS

CAR PARKING:

USE	VALUE	CALC	REQUIRED
CHILD CARE	15 EMPLOYEES (est)	0.5/STAFF	7.5 (est)
	81 CHILDREN	1/10 CHILDREN	8.1
TOTAL REQUIRED			15.6 (est)
TOTAL PROVIDED			17

LEGEND:

- HARDSTAND PAVEMENT.
- PAVED FOOTPATHS.
- SELECTED LANDSCAPING.
- SELECTED SHADE TREE.

POINT WALTER ROAD

ADJOINING LOT 49
RESIDENTIAL

EXISTING COMMS PITS, INVESTIGATE AND RELOCATE AS REQUIRED.

1000 SETBACK | 3600 BIN STORE | 5300 | 15600 6 BAYS @ 2600 | 2400 DA BAY | 2400 SHARED | 26000 10 BAYS @ 2600 | 1300 | 330 | EXISTING SEWER LINE

2.0m HIGH COLORBOND FENCE | BDY 53.32m | 2.0m HIGH COLORBOND FENCE

CAVITY FILLED BRICKWORK RETAINING WALL

300 | 6100 CROSSOVER | 22340

NEW CROSSOVER TO LOCAL AUTHORITY STANDARDS

TWO-SIDED BICYCLE RAIL (12 BIKES).

LOT 1
1,853m²

ACCESSIBLE PARKING BAY AND SHARED AREA WITH BOLLARD IN ACCORDANCE WITH AS2890.6.

CARPARK
17 BAYS

MOTORCYCLE / SCOOTER PARKING BAY.

1.8m HIGH FENCE

EXIST POWER POLE

BIN STORE

6100 AISLE | 3000 SETBACK | 5400 BAYS | 2000 BIN STORE | 1200 PATH | 2000

FOOTPATH

EXIST OVERHEAD POWERLINES

PLAY EQUIP STORE | ENTRY | PLAY EQUIP STORE

1.8m HIGH SEMI-PERMEABLE FENCE.

BDY 34.74m

EXIST SIDE-ENTRY PIT

OUTDOOR PLAY AREA 1
PLAY AREA TO HAVE 'NATURE PLAY' THEME (DESIGNED BY OTHERS)

VERANDAH | **CHILD CARE CENTRE**
81 CHILDREN
GLA 508m² APPROX. | VERANDAH

2m HIGH FENCE

OUTDOOR PLAY AREA 2
PLAY AREA TO HAVE 'NATURE PLAY' THEME (DESIGNED BY OTHERS)

CAVITY FILLED BRICKWORK RETAINING WALL | 2.0m HIGH SOLID MASONRY FENCE

21140 OUTDOOR PLAY AREA | 22340

1.8m HIGH SEMI-PERMEABLE FENCE.

OPEN STYLE FENCE AROUND EXISTING TREE. ADJUST PIER SETOUT TO SUIT ROOT SYSTEM. ENSURE MIN. OUTDOOR PLAY AREA (m2) IS ACHEIVED.

1.8m HIGH FENCE

500 | 1000 SETBACK

CAVITY FILLED BRICKWORK RETAINING WALL

1.8m HIGH SOLID MASONRY FENCE | 1.8m HIGH C'BOND FENCE | BDY 53.32m | 2.0m HIGH SOLID MASONRY FENCE

EXISTING TREES TO BE RETAINED.

EXISTING COMMS PIT.

3000 TBC | 7230 TBC MASONRY FENCE | 24740 COLORBOND FENCE | 18360 MASONRY FENCE

1600 VERANDAH SETBACK | 2400 VERANDAH | 8100 | 9000 | 8100 | 2400 VERANDAH | 15730 VERANDAH SETBACK

10000 BUILDING SETBACK | 25200 BUILDING | 18130 BUILDING SETBACK

ADJOINING LOT 501
RESIDENTIAL

ADJOINING LOT 1
RESIDENTIAL

ADJOINING LOT 2
RESIDENTIAL

N

HINDLEY & ASSOCIATES PTY LTD
BUILDING DESIGNERS

166 STIRLING HIGHWAY
NEDLANDS WA 6009

PO BOX 199
NEDLANDS WA 6909

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admin@hindley.com.au

DEVELOPMENT APPLICATION

HINDLEY & ASSOCIATES P/L AS TRUSTEE FOR HINDLEY TRUST ACN No. 088 989 904

BUILDING DESIGNERS ASSOCIATION OF WA INC

No.	Date	Revision	Drawn	Check
A	18.02.22	ISSUED FOR DA	JJR	SDS
B	31.03.22	ISSUED FOR DA	JJR	SDS
C	05.05.22	MOTORCYCLE BAY ADDED	SDS	SJH
D	05.05.22	PICK UP & STAFF PARKING BAYS	JJR	SJH
E	11.07.22	ENTIRE CENTRE FLIPPED	SDS	SJH
F	12.07.22	AISLE WIDTH INCREASED	SDS	SJH
-				
-				

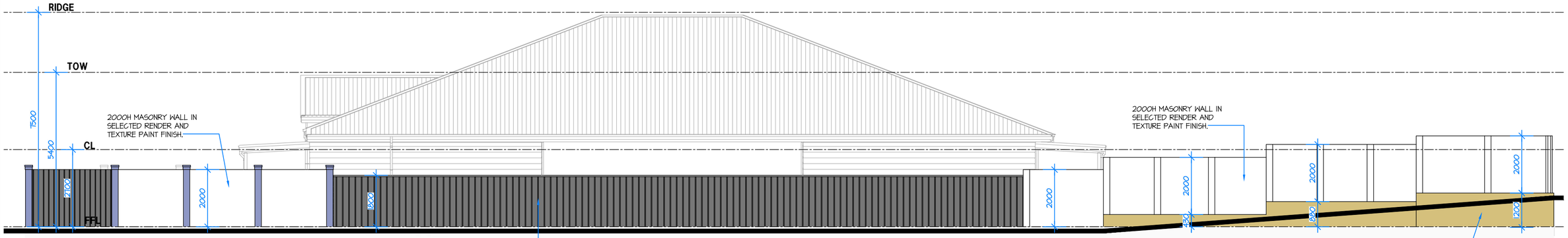
A2 SHEET

PROPOSED SITE PLAN

SCALE 1:200

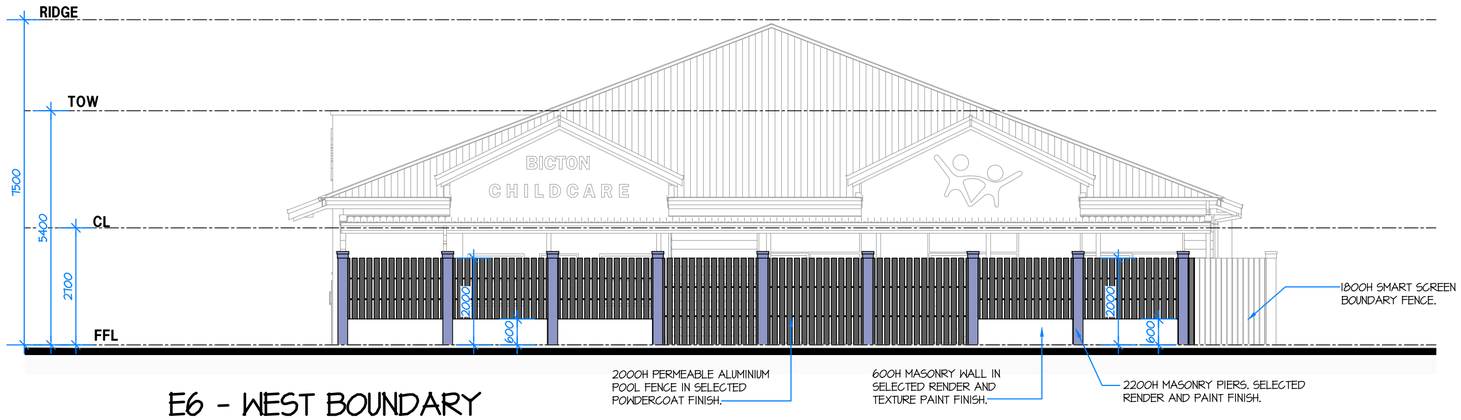
PROPOSED CHILD CARE CENTRE
38 POINT WALTER ROAD
BICTON W.A.
for SPEARWOOD LAND PTY LTD

Date	-	10.01.22
Design	-	SDS
Drawn	-	SDS
Checked	-	SJH
Scale	-	1:200
Job No.	-	0787
Dwg	-	DA01
Rev	-	F



E5 - SOUTH BOUNDARY

SCALE 1:100



E6 - WEST BOUNDARY

SCALE 1:100

HINDLEY & ASSOCIATES P/L
AS TRUSTEE FOR
HINDLEY TRUST
ACN No. 088 989 904

BUILDING DESIGNERS ASSOCIATION OF WA INC

No.	Date	Revision	Drawn	Check
A	18.02.22	ISSUED FOR DA	JJR	SDS
B	15.07.22	SITE MIRRORED	JJR	SDS

A2 SHEET

HINDLEY & ASSOCIATES
PTY LTD
BUILDING DESIGNERS

166 STIRLING HIGHWAY
NEDLANDS WA 6009

PO BOX 199
NEDLANDS WA 6909

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admin@hindley.com.au

DEVELOPMENT APPLICATION

PROPOSED CHILD CARE CENTRE
38 POINT WALTER ROAD
BICTON W.A.
for SPEARWOOD LAND PTY LTD

Date - 10.01.22
Design - JJR
Drawn - JJR
Checked - SJH
Scale - 1:100
Job No. - 9787
Dwg - DA06
Rev - B