HERRING STORER ACOUSTICS

PROPOSED CHILD CARE CENTRE
67 BERWICK STREET, VICTORIA PARK

ENVIRONMENTAL ACOUSTIC ASSESSMENT

JANUARY 2023

OUR REFERENCE: 30529-2-22405

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FOR

GERMANO DESIGNS

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APPENDICIES

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 67 Berwick Street, Victoria Park.

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 residences from the outdoor play areas would comply with the requirements of the *Environmental Protections (Noise) Regulations 1997*, with the fencing, as shown on the plan attached in Appendix A; and provided outdoor play is limited to the day period (ie after 7am).

Noise from the mechanical services has also been assessed to comply with the relevant criteria. However, as the assessment has not been based on the mechanical services design, it is recommended that additionally, 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 and parking restrictions, as shown on Figure 5.1 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 be as shown on the drawings attached in Appendix A.

3 Parking to be restricted, as shown on Figure 5.1 in Section 5 – Modelling.

4 For child care centres colourbond fencing is acceptable fencing material.

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.

An aerial showing the neighbouring premises are shown below on Figure 3.1.

FIGURE 3.1 – NEIGHBOURING LOTS

For the neighbouring residences, the influencing factor has been determined to be +6 dB as "Berwick Street" is within 100m . 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)	51	61	71
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	46	56	71
	1900 - 2200 hours all days (Evening)	46	56	61
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	41	51	61

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 1830 hours, Monday to Friday (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 52 children: with the following breakdown:

Infant/Toddler	0 – 2 years	8 places
Pre-Kindy	2 – 3 years	14 places
Kindy	3+ years	30 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	<24 months 78(per 10 children) >24 months 83 (per 10 children)
Car Moving in Car Park	79
Car Starting	85
Door Closing	87
Air conditioning condensing Unit	10 @ 71
Exhausts	72 (kitchen)

Notes:

1 Acoustic modelling of outdoor play noise was made, based on:

- any age group of children within the outdoor play area (ie worst case scenario)

2 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.

3 For this child care centre, it is recommended that the air conditioning units be surrounded on all sides by a barrier minimum 1000mm, preferably 1500mm tall.

4 The noise modelling has been based on a 1800mm high fence to the north and south of the lot, as well as a 2200mm high fence to the west of the lot away from Berwick Street.

5 To determine the restriction to the parking, a point noise source was located in each car bay.

6 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 during the night period (ie before 7am), for staff arriving, the parking needs to be restricted, as shown on Figure 5.1.

7 Restricted bays must be visibly signed that they cannot be used before to 7am.

8 With only staff arriving before 07:00 am, there would be no car starts before 7am.

9 Calculation were undertaken for the receivers at 1.5 metres above the ground level.

10 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.

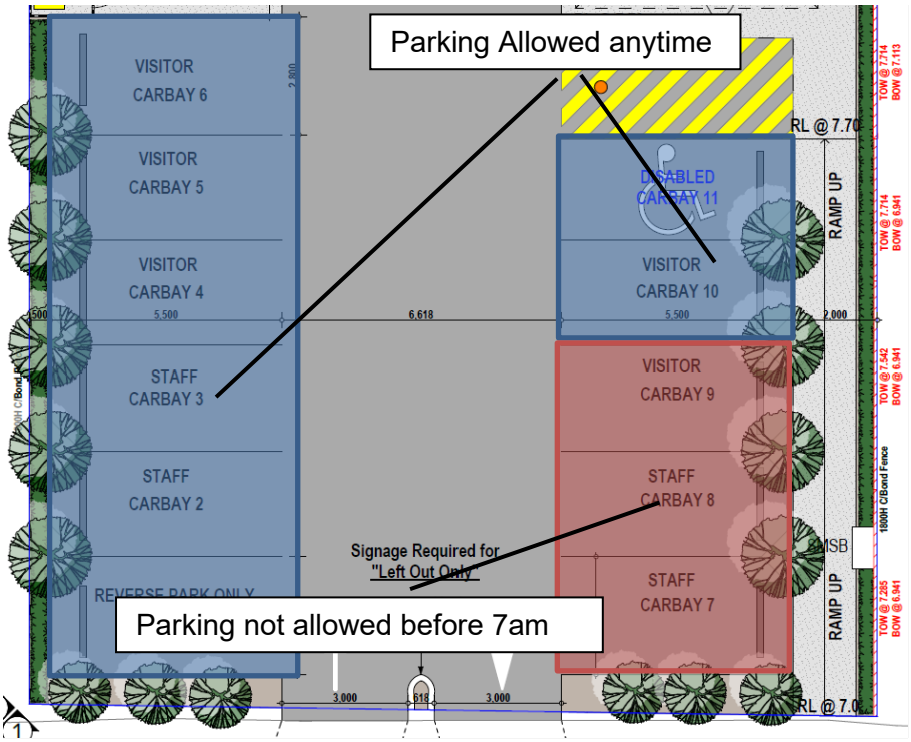


FIGURE 5.1 – PARKING RESTRICTIONS

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
R1 – East Residential Lots	34	24 (29)
R2 – North Residential Lots	50	31 (36)
R3 – South Residential Lots	51	31 (36)
R4 – West Residential Lots	51	31 (36)

( ) 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))
R1 – East Residential Lots	38
R2 – North Residential Lots	44
R3 – South Residential Lots	44
R4 – West Residential Lots	20

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
R1 – East Residential Lots	47	N/A	48 [58]	48 [58]
R2 – North Residential Lots	55	N/A	58 [68]	51 [61]
R3 – South Residential Lots	48	N/A	51 [61]	51 [61]
R4 – West Residential Lots	29	N/A	30 [40]	30 [40]

[ ] 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
R1 – East Residential Lots	34	51	Complies
R2 – North Residential Lots	50	51	Complies
R3 – South Residential Lots	51	51	Complies
R4 – West Residential Lots	51	51	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
R1 – East Residential Lots	29	41	Complies
R2 – North Residential Lots	36	41	Complies
R3 – South Residential Lots	36	41	Complies
R4 – West Residential Lots	36	41	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
R1 – East Residential Lots	38	51	Complies
R2 – North Residential Lots	44	51	Complies
R3 – South Residential Lots	44	51	Complies
R4 – West Residential Lots	20	51	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
R1 – East Residential Lots	47	71	Complies
R2 – North Residential Lots	55	71	Complies
R3 – South Residential Lots	48	71	Complies
R4 – West Residential Lots	29	71	Complies

TABLE 6.8 – 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
R1 – East Residential Lots	58	71	Complies
R2 – North Residential Lots	68	71	Complies
R3 – South Residential Lots	61	71	Complies
R4 – West Residential Lots	40	71	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
R1 – East Residential Lots	58	61	Complies
R2 – North Residential Lots	61	61	Complies
R3 – South Residential Lots	61	61	Complies
R4 – West Residential Lots	40	61	Complies

7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level, with the fencing as shown on the drawings attached in Appendix A.

The air conditioning condensing units have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times.

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 5.1 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 be as shown on the drawings attached in Appendix A.

3 Parking to be restricted, as shown on Figure 5.1 in Section 5 – Modelling.

4 For child care centres colourbond fencing is acceptable fencing material.

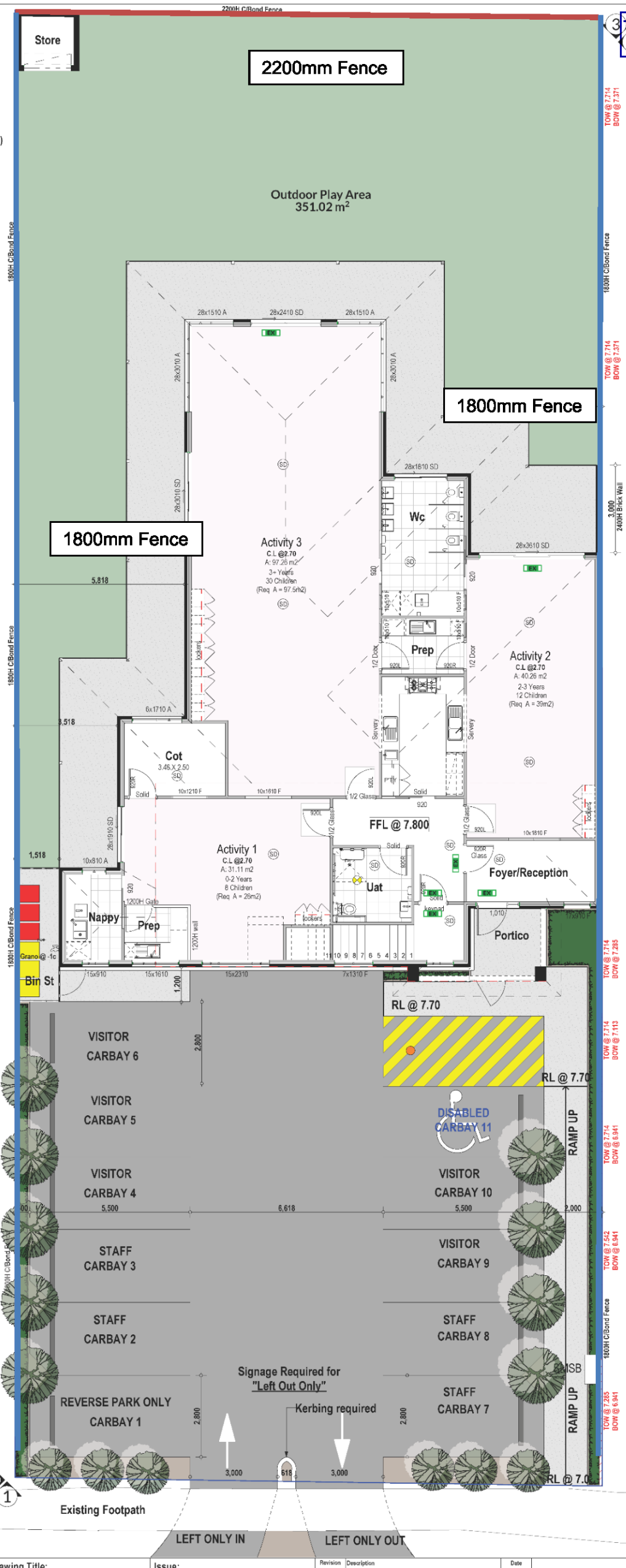
APPENDIX A

PLANS

Child / Room Calculations

Room	Age (Yrs)	Quant	Size
Activity 1	*0-2*	8	*31.11m²*
Activity 2	*2-3*	12	*40.26m²*
Activity 3	*3+*	30	*97.26m²*
Total Internal = (Min 3.25m² per child)		50	168.63m² (Min 162.50m² req)
Total External Play Area = (Min 7m² per child)		50	351.02m² (Min 350m² req)

Victoria park parking policy - 1 bay for every 5 children (10 req)



Store	4.50
Portico	5.20
Ground Floor	282.78
First Floor	86.60
Bin St	6.97

Landscaping Calculations

Site Area	= 1,011.73m²
Soft Landscaping Area	= 36.46m²

SCALE 1:100

Client: [redacted]
Project Name: Childcare Centre
Project Address: 67 Berwick St Victoria Park

Drawing Title: Ground Floor
Scale: as noted | Sheet Size: A1
Project No: 22077 | Drawing No.: PD04 of 10

Issue: Development Approval

Rev:	Description:	Drawn:
011	Council Comments	CD

Revision Number: 011 | Date: 13.09.2023

Revision	Description	Date
011	Council Comments	13.09.23
010	Planner Comments	30.08.23
009	Council Comments	17.08.23
008	Council Comments	21.07.23
007	Council Comments	23.06.23
006	Council Comments	07.06.23
005	Council Comments	01.06.23

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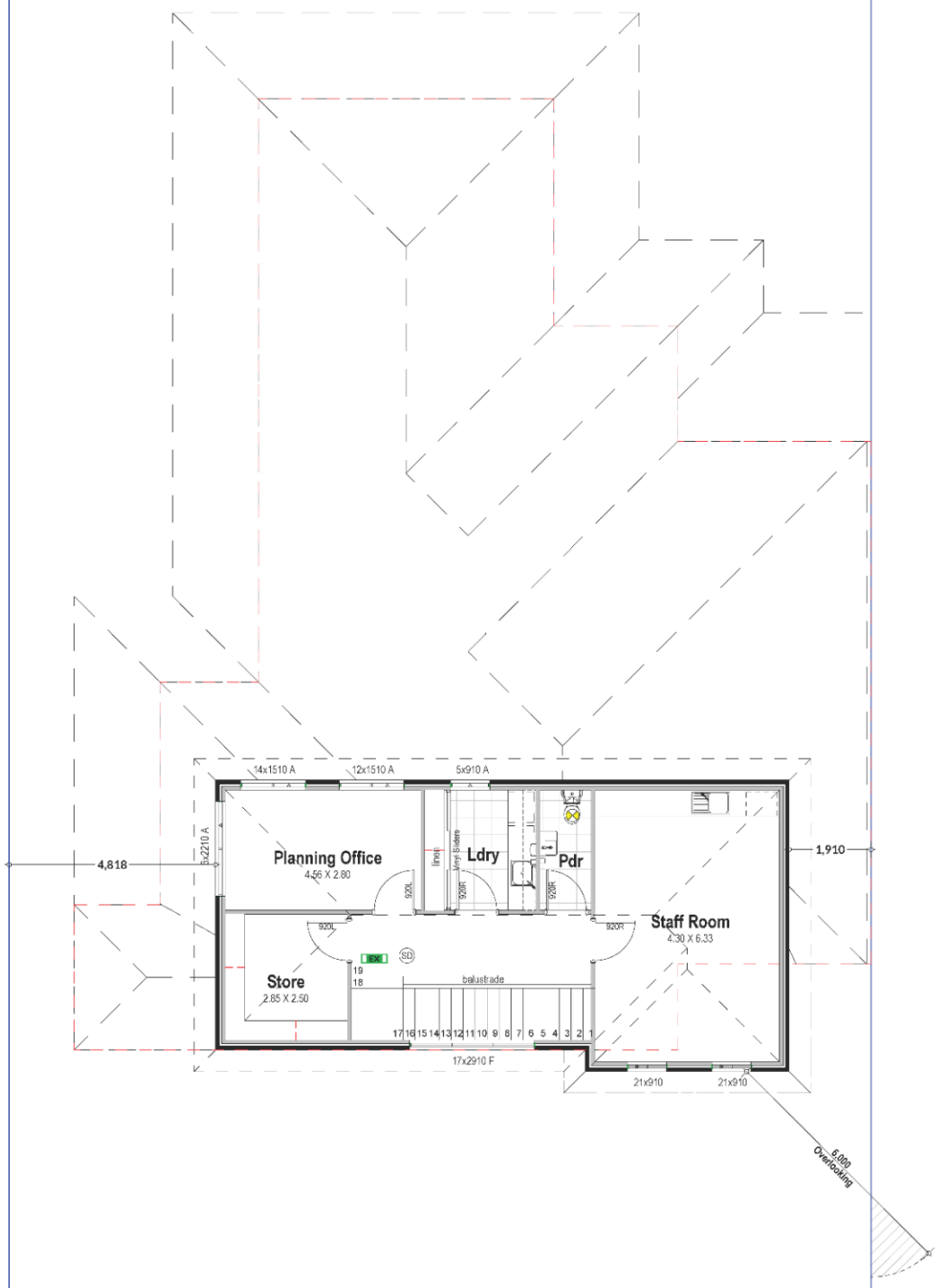
ıl External Play Area = ı 7m² per child)		50	351.02m² (Min 350m² re

oria park parking policy - 1 bay for every 5 children (10 req)

Building Areas	
Store	4.50
Portico	5.20
Ground Floor	282.78
First Floor	86.60
Bin St	6.97



SCALE 1:100

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[redacted]
Project Name
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Project Address
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011	Council Comments	13.09.23
010	Planner Comments	30.08.23
009	Council Comments	17.08.23
008	Council Comments	21.07.23
007	Council Comments	23.06.23
006	Council Comments	07.06.23
005	Council Comments	01.06.23

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