

**PROPOSED CHILD CARE CENTRE
LOT 2035 (# 7) CRUSHING ROAD
ALKIMOS**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

DECEMBER 2021

OUR REFERENCE: 28781-2-21474

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ENVIRONMENTAL ACOUSTIC ASSESSMENT
PROPOSED CHILD CARE CENTRE
ALKIMOS

Job No: 21474

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FOR

GERMANO DESIGNS

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by the Germano Designs to undertake an acoustic assessment of noise emissions associated with the proposed child care centre located at Lot 2035 (#7) Crushing Road, Alkimos.

It is noted that the adjacent premises at 1580 (#45) Bainbridge Avenue, Alkimos is an existing child care centre and that the 2 centres will share parking.

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.

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.

2. SUMMARY

We understand that it is proposed that the proposed child care centre would cater for up to 51 children.

It is noted that although the proposed child care centre would open before 7.00am (ie during the night period), the outdoor play area would not be used until after 7.00am. Thus, noise received at the neighbouring residences from the outdoor play area needs to comply with the assigned day period noise level. However, other noise sources would need to comply with the assigned night period noise levels.

Noise received at the neighbouring premises from children playing in the outdoor areas of both centres would, with the fencing as shown on Figure 02 in Section 5 - Modelling, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the day period.

Noise from the mechanical services has also been assessed to comply with the relevant criteria. It is recommended that the air conditioning units be located within the drying court and this area would be screened from the neighbouring residences to the south. Additionally, to ensure compliance, these units should be installed with low noise night period modes.

Finally, noise emission from car doors within the car park would with the recommended parking restrictions, as shown on Figure 5.2 in Section 5, comply with the Regulatory requirements, at all times.

It is noted that noise associated with car movements is exempt from complying with the Regulations. Even so, noise emissions from these noise sources would comply with the Regulatory Requirements.

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

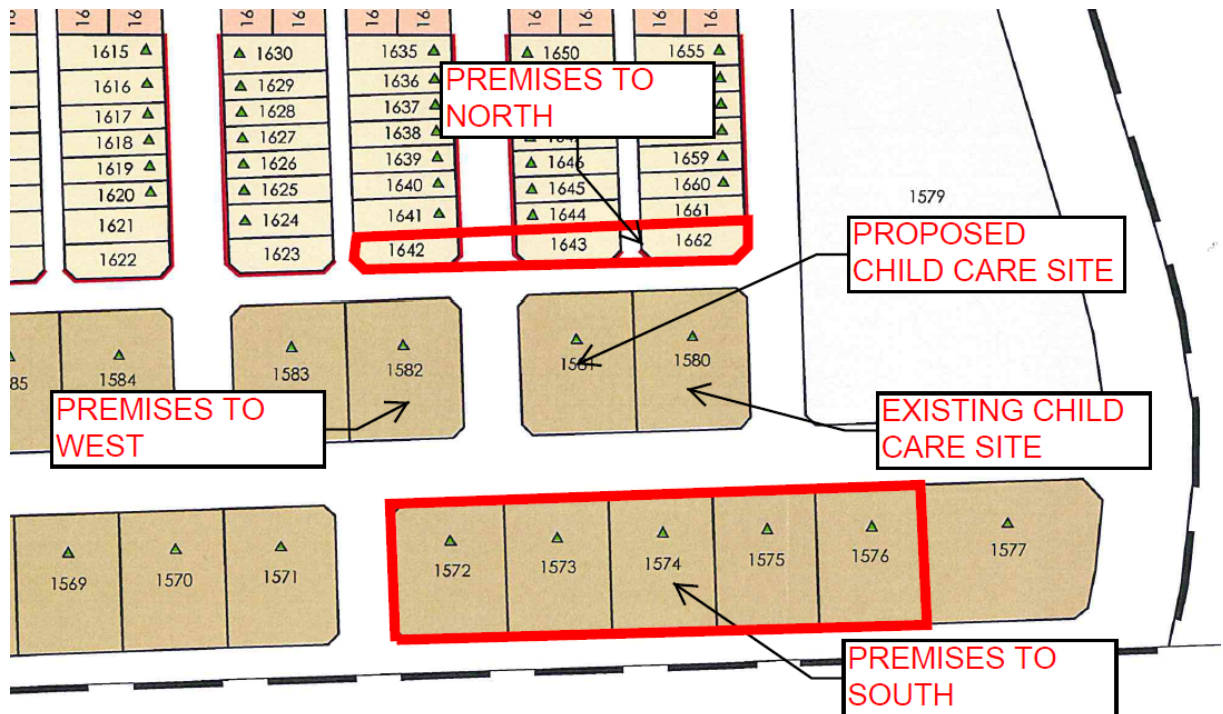


FIGURE 01 – NEIGHBOURING PREMISES

At the neighbouring residence, the influencing factor has been determined to be +1 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)	46	56	66
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	41	51	66
	1900 - 2200 hours all days (Evening)	41	51	56
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	36	46	56
Commercial Premises	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 0630 and 1900 hours, Monday to Friday and potentially on Saturdays between 0800 and 1300 hours (closed on public holidays). It is understood that the proposed childcare centre will cater for a maximum of 51 children, with the following breakdown of children:

0 – 2 years	-	16
2 - 3 years	-	15
3 – 5 years	-	20

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.

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

It is noted that the premises to the east is an existing child care centre. However, it is noted that the outdoor play areas are located at the opposite sides of each lot, thus the noise from children playing outdoors would not be cumulative. Even so, the noise modelling of the outdoor play area included the children playing outdoors modelled for the existing centre. Similarly for the mechanical services, we believe they would be located at the opposite sides of each child care centre building, however, again to be conservative, modelling was undertaken with all mechanical services operating.

Finally, as the car park is being modified, new noise modelling was undertaken for the noise sources within the car park.

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, 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 Starting	85
Car Moving in Car Park	76
Door Closing	87
Air conditioning condensing Unit	4 @ 71 (Existing) 3 @ 71 (Proposed)

Notes:

- 1 With regards to the air conditioning, we understand that the air conditioning has not been designed at this stage of the development. 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 these condensing units would be conservative.
- 2 Noise modelling has been undertaken with the air conditioning condensing units for the proposed child care centre located within the Drying Court, with the drying court being screened / barriered from the neighbouring residences to the south.
- 3 Noise modelling for the children playing within the outdoor area was based on the following :
 - Existing - 5 groups of 10 children.
 - Proposed - 4 groups of 10 children.
- 4 Noting the number of children in each child care centre under the age of 2 years, the above scenario would be conservative.
- 5 Noise modelling was undertaken to a number of different receiver locations for each of the neighbouring residences shown in Figure 01. These receiver locations were at locations adjacent to the proposed child care centre. However, to simplify the assessment, only the noise level in the worst case location for each direction, have been listed.
- 6 Preliminary noise modelling indicates that noise received at the neighbouring premises from children within the outdoor play area and the air conditioning condensing units could result in an exceedance of the Regulations. To comply with the regulatory criteria, additional fencing, as shown on Figure 5.1 is required. With regards to the air conditioning condensing units, to achieve compliance, the access to the AC Store be to the west (ie from car park). Model includes boundary fence to the west.
- 7 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.

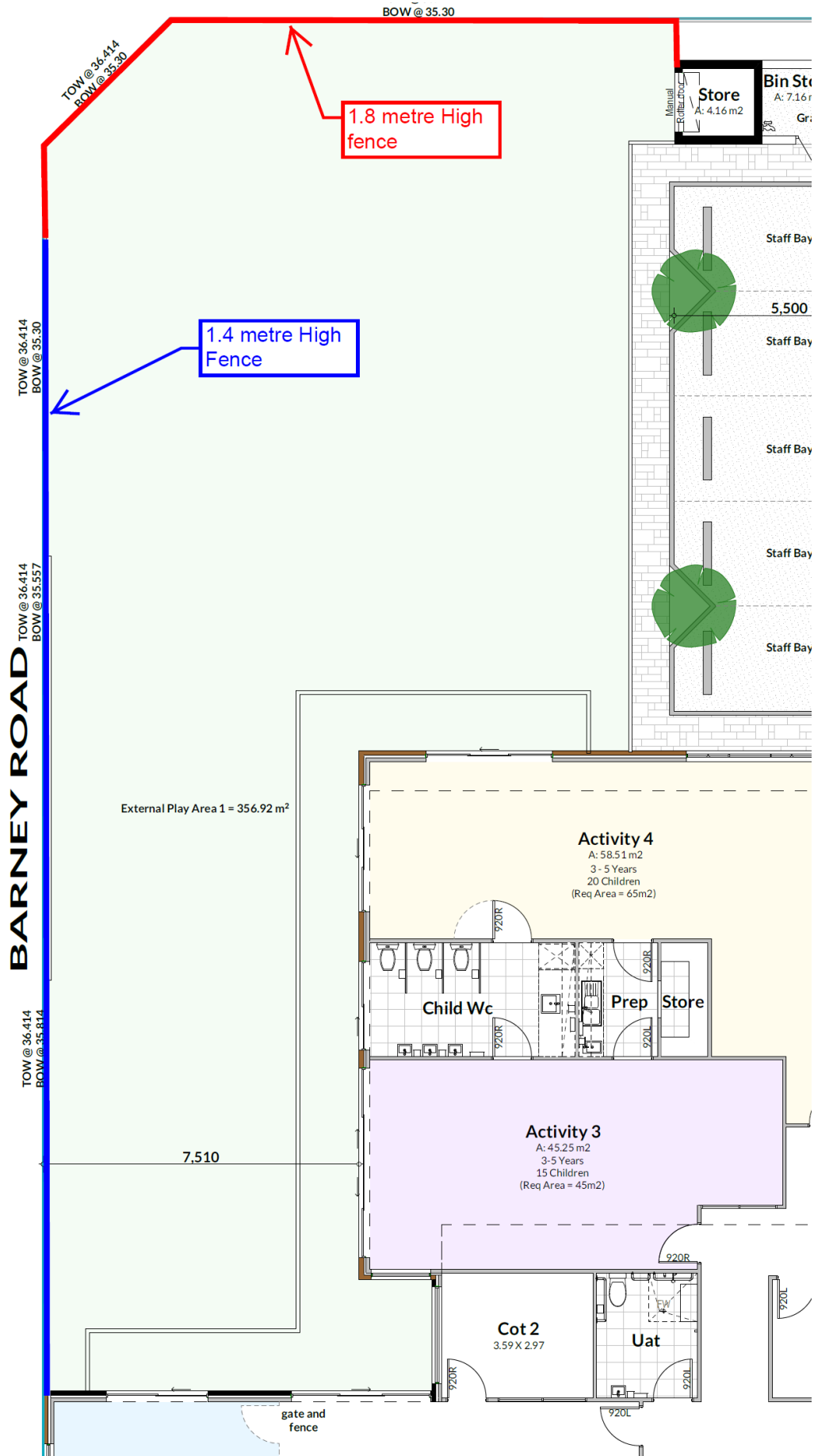


FIGURE 5.1 – ADDITIONAL FENCING

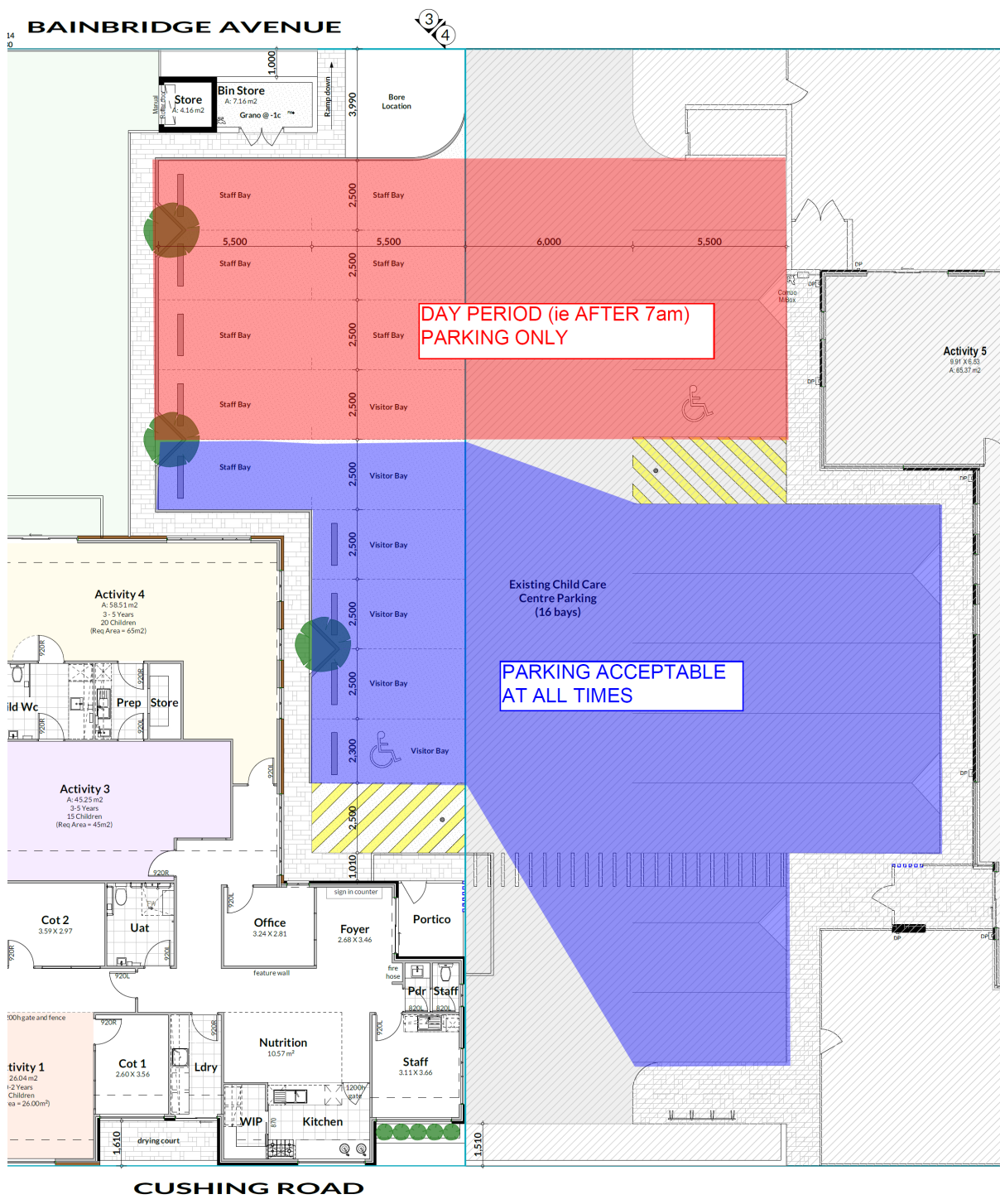


FIGURE 5.2 – NIGHT PERIOD PARKING RESTRICTIONS

6. ASSESSMENT

Although under the regulations, for the purposes of determining the Influencing Factor, the land type used in determining the Assigned Noise level is based on the land usage that results in the highest Influencing Factor, it has been assumed that the neighbouring premises could contain residential components. Thus, noise received at these premises has been based on noise received at a “highly” sensitive area of a noise sensitive premises.

Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 50 children playing outside within the outdoor play areas at the one time, utilising 5 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 residences are also listed in Table 6.1.

From previous measurements, noise emissions from children playing is a broadband type noise and does not contain any annoying characteristics in accordance with the *Environmental Protection (Noise) Regulations 1992*. Noise emissions from the mechanical services would be tonal and a +5 dB(A) penalty would be applied, 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
Premises to North	46	31 (36)
Premises to South	45	29 (34)
Premise to West	45	27 (32)

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

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

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

Neighbouring Premises	Calculated Noise Level (dB(A))
Premises to North	41
Premises to South	37
Premise to West	29

**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
Premises to North	49	44	51 [61]	46 [56]
Premises to South	41	41	42 [51]	42 [51]
Premise to West	35	35	38 [48]	38 [48]

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

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

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
Premises to North	46	46	Complies
Premises to South	45	46	Complies
Premise to West	45	46	Complies

**TABLE 6.5 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS
 ALL AIR CONDITIONING**

Location	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
Premises to North	36	36	Complies
Premises to South	34	36	Complies
Premise to West	32	36	Complies

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

Location	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
Premises to North	41	46	Complies
Premises to South	37	46	Complies
Premise to West	29	46	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
Premises to North	49	66	Complies
Premises to South	41	66	Complies
Premise to West	29	66	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
Premises to North	44	56	Complies
Premises to South	41	56	Complies
Premise to West	29	56	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
Premises to North	59	66	Complies
Premises to South	51	66	Complies
Premise to West	48	56	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
Premises to North	56	56	Complies
Premises to South	51	56	Complies
Premise to West	48	56	Complies

7. CONCLUSION

It is proposed that the proposed child care centre would cater for up to 51 children.

Noise received at the neighbouring residential premises from children playing in the outdoor play area would, with the additional fencing as shown on Figure 01 in Section 5 - Modelling, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the day period. It is understood that although the child care centre would open before 7am, the outdoor play area would not be utilised until after 7am. Hence, compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997* would be achieved.

Noise from the mechanical services has also been assessed to comply with the relevant criteria. However, it is recommended that the air conditioning be located within the drying court, and they be screened from the neighbours to the south with a solid barrier. Additionally, the units should be installed with low noise night period modes.

Finally, noise emission from car doors within the car park would with the recommended parking restrictions, as shown on Figure 5.2 in Section 5, comply with the Regulatory requirements, at all times.

It is noted that noise associated with car movements is exempt from complying with the Regulations. Even so, noise emissions from these noise sources would comply with the Regulatory Requirements.

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

Panda ELC

Address: Lot 2035 (#7) Cushing Road, Alkimos

Childcare Centre

Job Number: 21087

Drawing No	Description
PD01	Cover Sheet
PD02	Existing Site Survey & Site Plan
PD03	Floor Plan
PD04	Elevations



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LEGEND

- Gas Main
- Water Main
- Sewer Main
- Gully
- Stop Valve
- Sewer Manhole
- Light Pole
- Power Dome
- Telstra/NBN Pit
- Peg/Boundary Mark

Survey Date: 16 September 2021 Scale 1:200@A3

Client: Rajai Wahhab

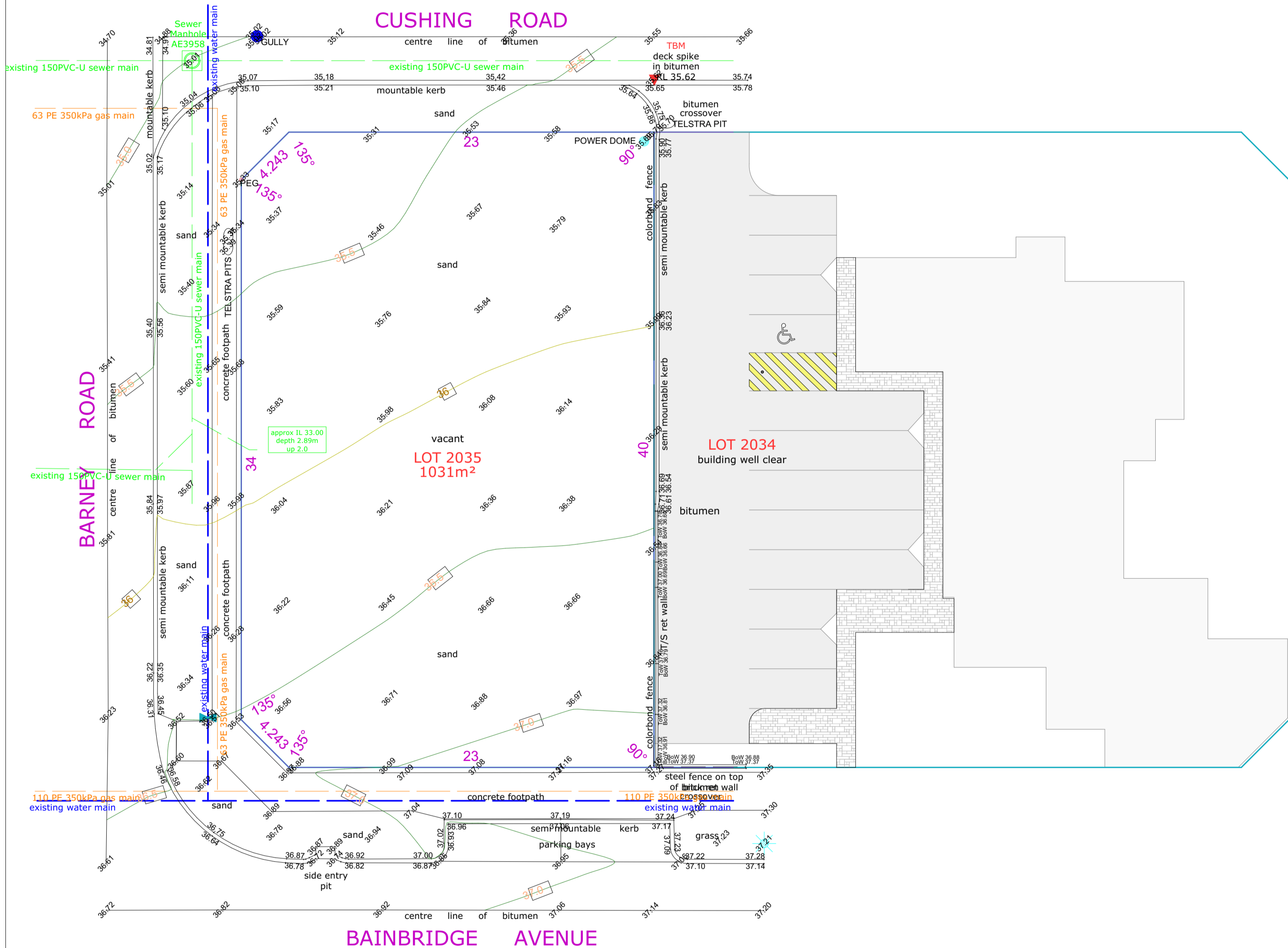
Rev	Date	Description	Surv	Drawn
0	17/09/2021	Feature Survey Drafted	TF	TF

FEATURE AND CONTOUR SURVEY OF LOT 2035 ON DEPOSITED PLAN 417006

7 Cushing Road, Alkimos
C/T Vol: 2973 Fol: 126
our ref. 21-9442

Feature Survey by
THE LAND DIVISION
PO Box 2444,
Malaga, WA 6090
phone: 08 9209 3232
www.landdivision.com.au

NOTES: 1) CONSULT LEGAL ADVICE ON EASEMENTS, ENCUMBRANCES AND CAVEATS THAT MAY APPEAR ON THE CERTIFICATE OF TITLE. 2) LEVELS ON ADJOINING PROPERTIES ARE APPROXIMATE DUE TO ACCESS RESTRICTIONS. 3) SERVICES PLOTTED AS VISUALLY SEEN ON SITE AND ARE APPROXIMATE. 4) SEWER POSITION AND LEVELS FROM WATER CORPORATION PLANS. 5) CONSULT DIA. BEFORE YOU DIG TO CHECK LOCATION OF UNDERGROUND SERVICES. 6) BEWARE OF OVERHEAD POWER LINE HAZARDS. 7) CONSULT TLD ON ANY ANOMALY BEFORE DESIGN AND CONSTRUCTION. 8) POSITION AND DEPTH OF SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR. 9) FEATURES ARE RELATED TO FENCE-LINES ONLY. NO CONNECTION MADE TO BOUNDARIES. REPEG RECOMMENDED.



LEGEND

- Gas Main
- Water Main
- Sewer Main
- Gully
- Stop Valve
- Sewer Manhole
- Light Pole
- Power Dome
- Telstra/NBN Pit
- Peg/Boundary Mark

Survey Date: 16 September 2021 Scale 1:200@A3

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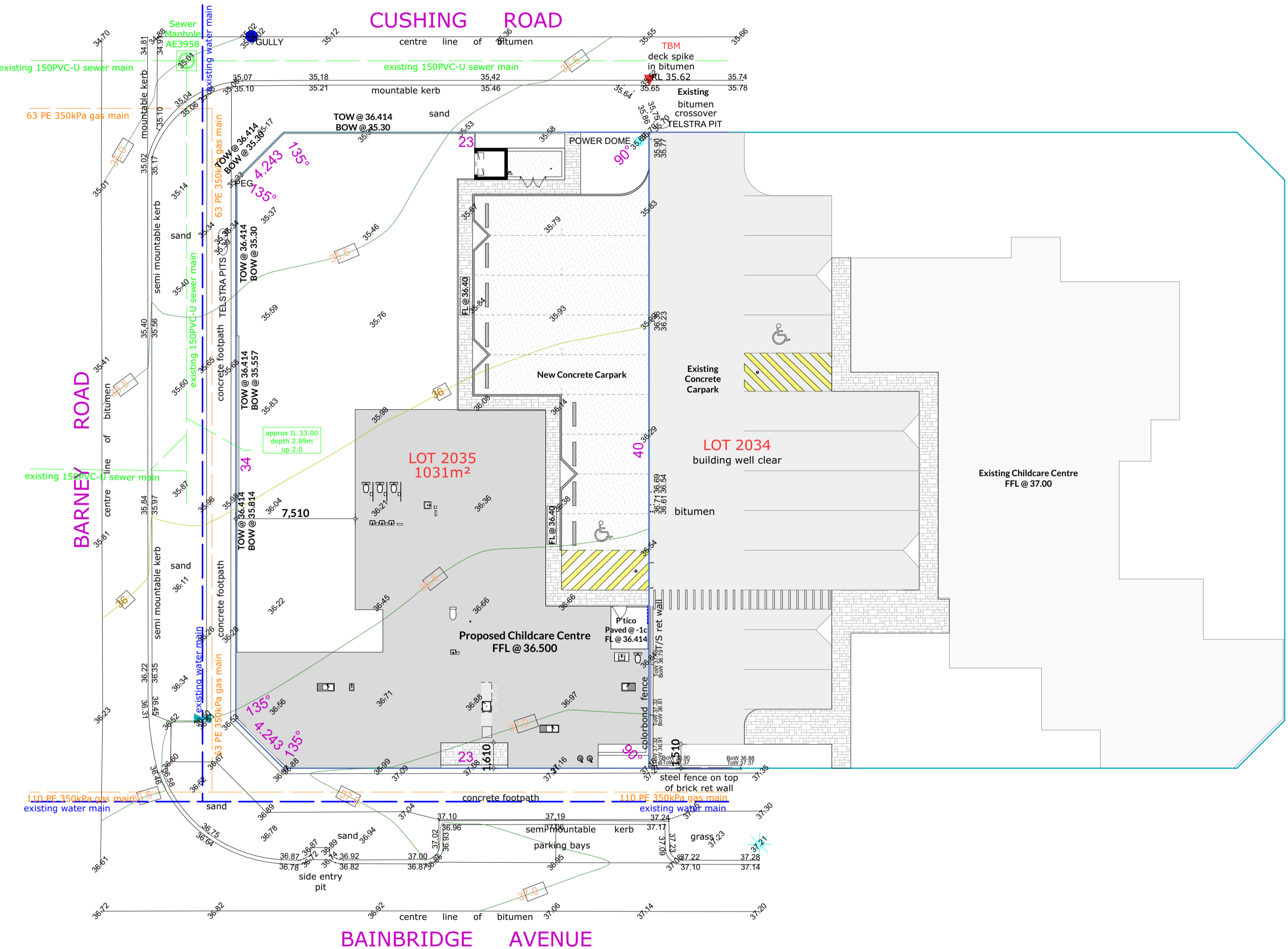
Rev	Date	Description	Surv	Drawn
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Client: Panda ELC
Project Name: Childcare Centre
Project Address: Lot 2035 (#7) Cushing Road, Alkimos

Drawing Title: Existing Site Survey & Site Plan
Scale: as noted
Project No: 21087

Issue: Development Approval
Rev: 007
Revision Number: 007
Date: 17/11/2021

Sheet Size: A1
Drawing No: PD02 of 04

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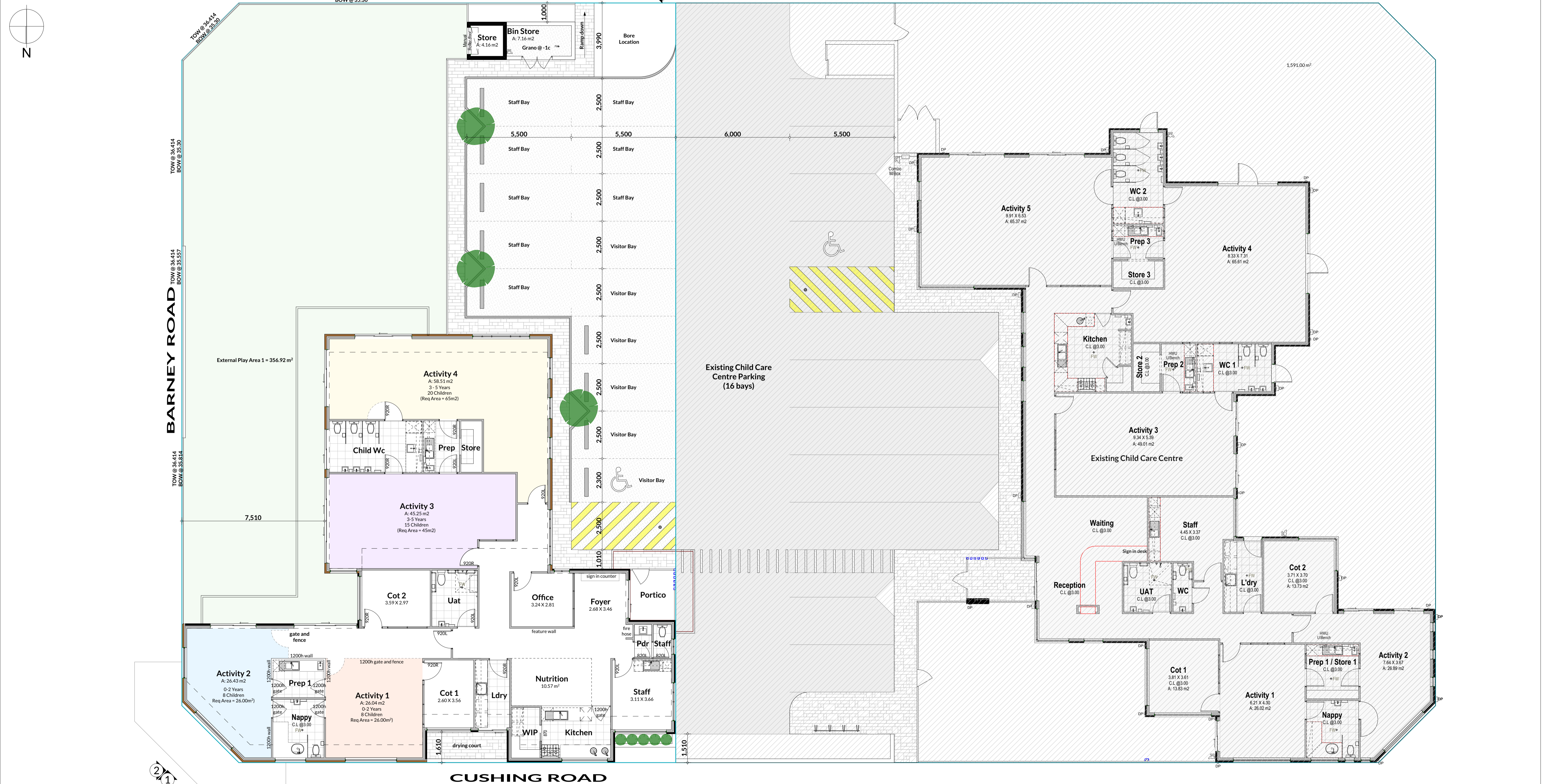
Child / Room Calculations

Room	Age (Yrs)	Quant.	Size	Staff Req
Activity 1	0-2	8	26.04m ²	2
Activity 2	0-2	8	26.43m ²	2
Activity 3	3-5	15	45.25m ²	2
Activity 4	3-5	20	58.51m ²	2
Nutritional			10.57m ²	
Total Internal = (Min 3.25m ² per child)		51	166.80m² (Min 165.75m ² req)	8
Total External Play Area = (Min 7m ² per child)		51	357.11m² (Min 357.00m ² req)	

Parking Calculations
as per Wanneroo Local Planning Policy 2.3: Child Care Centres

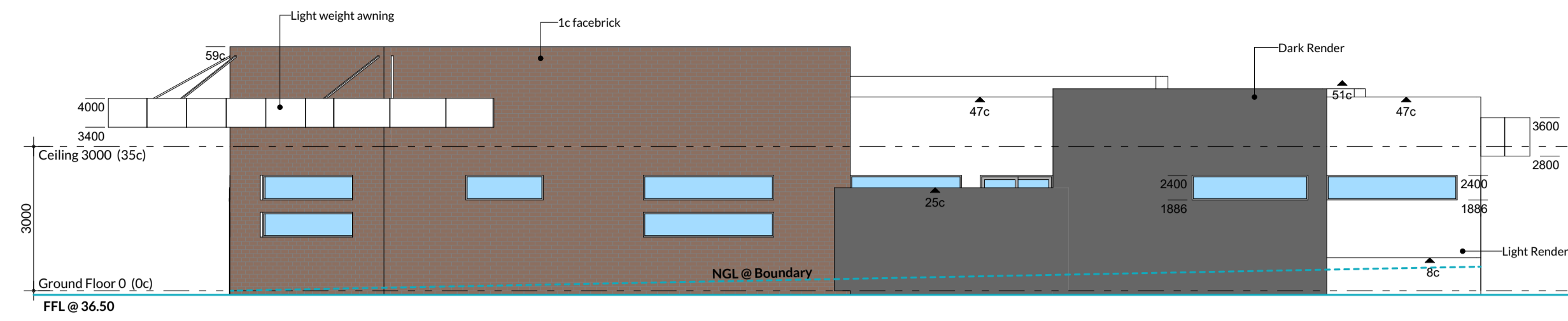
Requirement	Quant	Bays Req'd	Bays Provided
1 space per staff	8	8	8
Type 2 parking	7	7	7

Zone	Area	Perim
Bin Store	7.16	11.18
Child Care Centre	363.50	101.89
Portico	6.75	10.50
Store	4.16	8.16
Total	381.57 m²	131.73 m

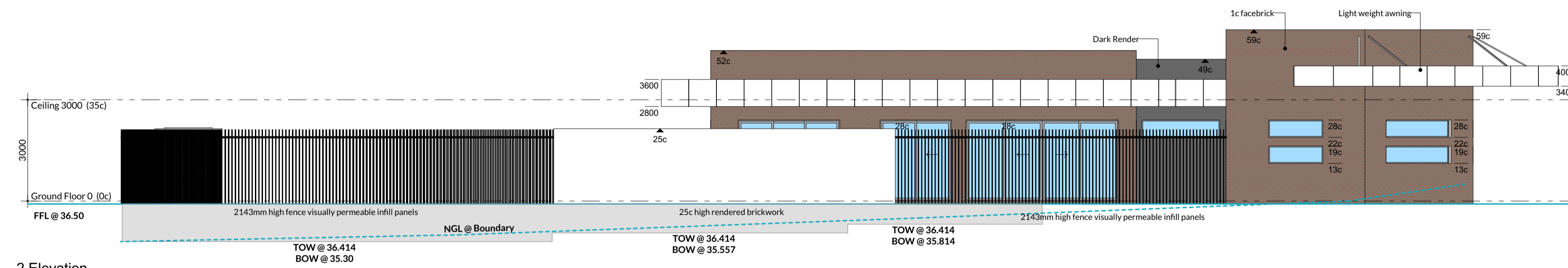


Child Care Centre
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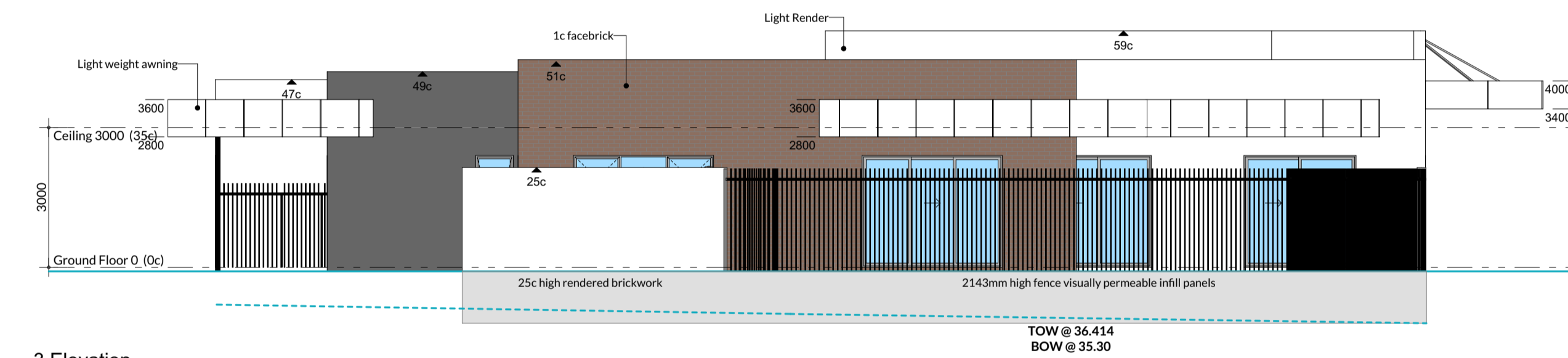
Client Panda ELC	Drawing Title Floor Plan	Issue Development Approval	
Project Name Childcare Centre	Scale: as noted Sheet Size: A1	Rev: Description: Drawn:	
Project Address Lot 2035 (#7) Cushing Road, Alkimos	Project No: 21087 Drawing No: PD03 of 04	Revision Number: 007 Date: 17/11/2021	
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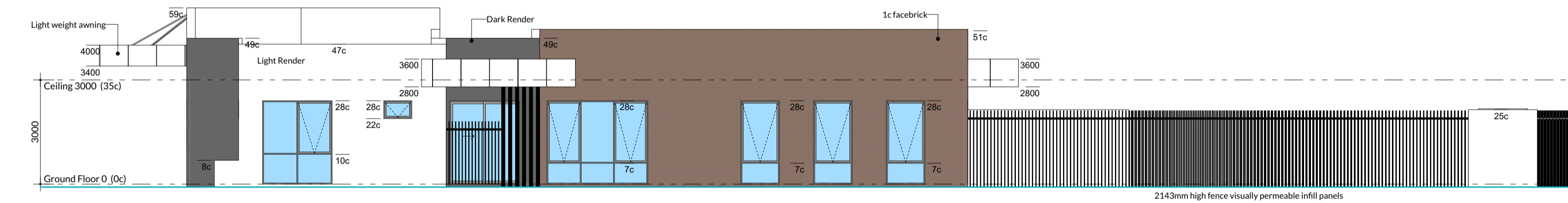
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2 Elevation
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4 Elevation
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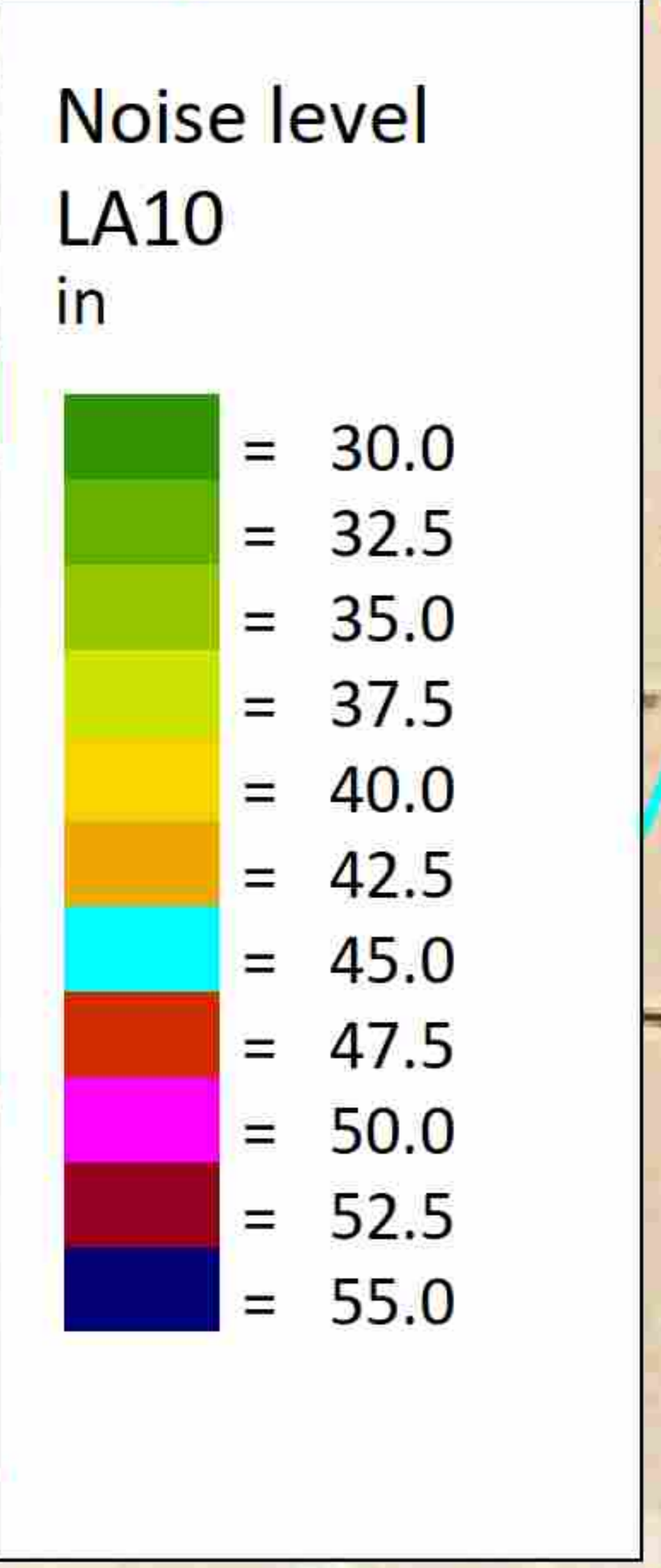
Client Panda ELC Project Name Childcare Centre Project Address Lot 2035 (#7) Cushing Road, Alkimos	Drawing Title: Elevations		Issue: Development Approval		GERMANO DESIGNS <small>The client shall retain the sole copyright of GERMANO DESIGN'S work and the plans, and shall be deemed to have agreed to the purchase or writing of the contract.</small>
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	Project No: 21087	Drawing No.: PD04 of 04	007	Planning Drawings	
	Revision Number: 007	Date: 17/11/2021	CD	Unit: 3/1 Mulgool Road, Malaga WA 6090 (08) 9248 8392 www.germanodesigns.com.au	

APPENDIX B

NOISE CONTOUR PLOTS



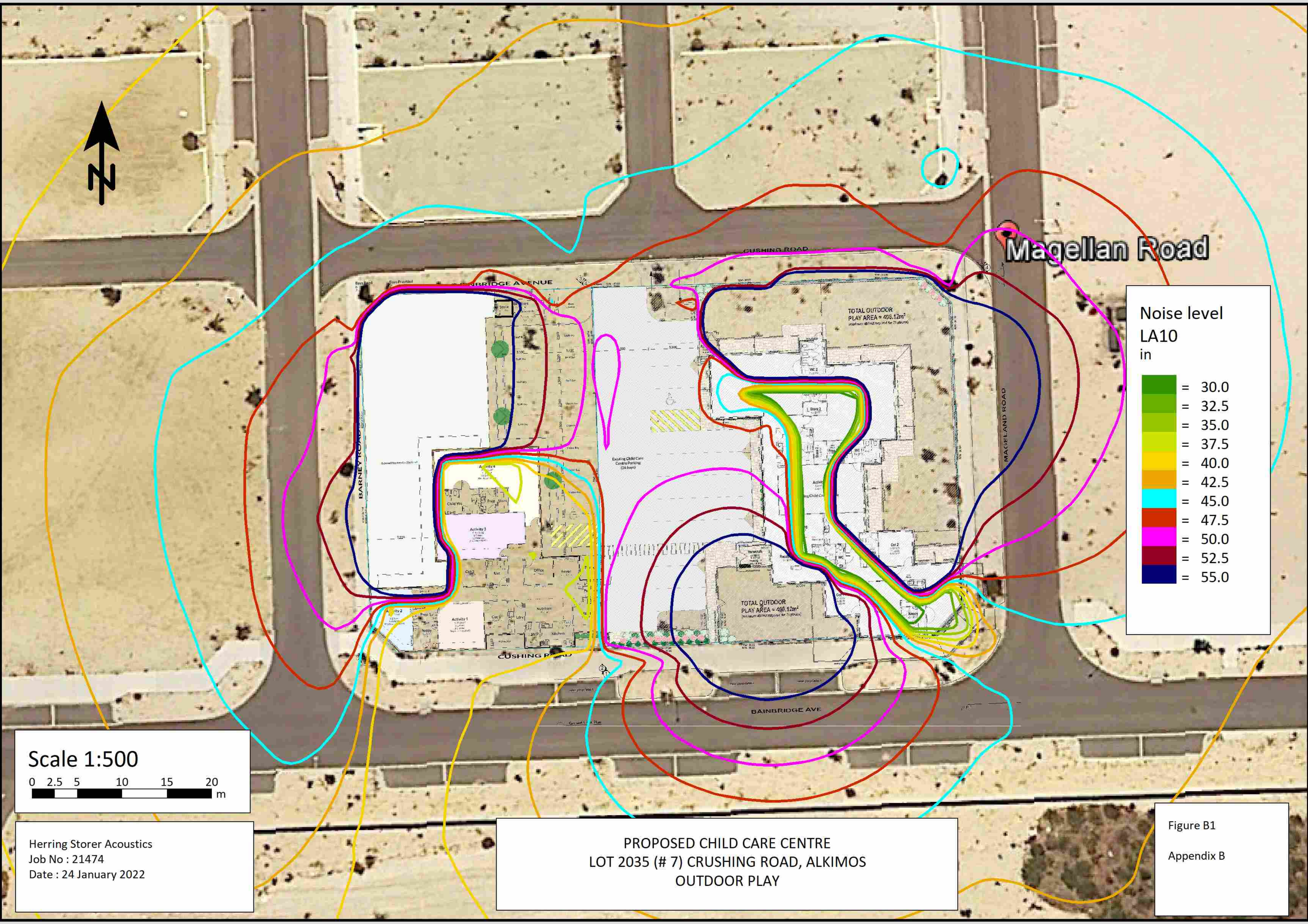
Magellan Road



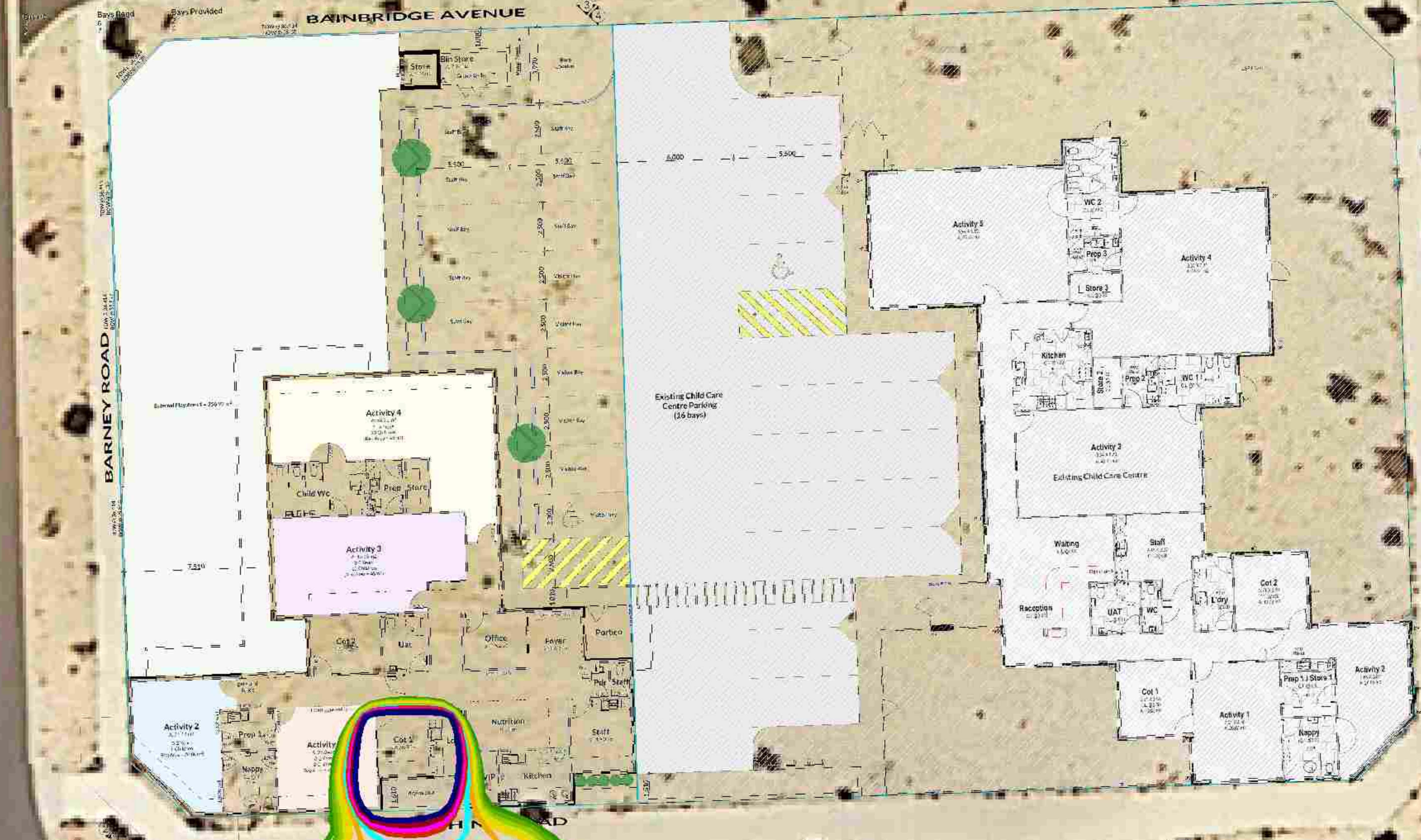
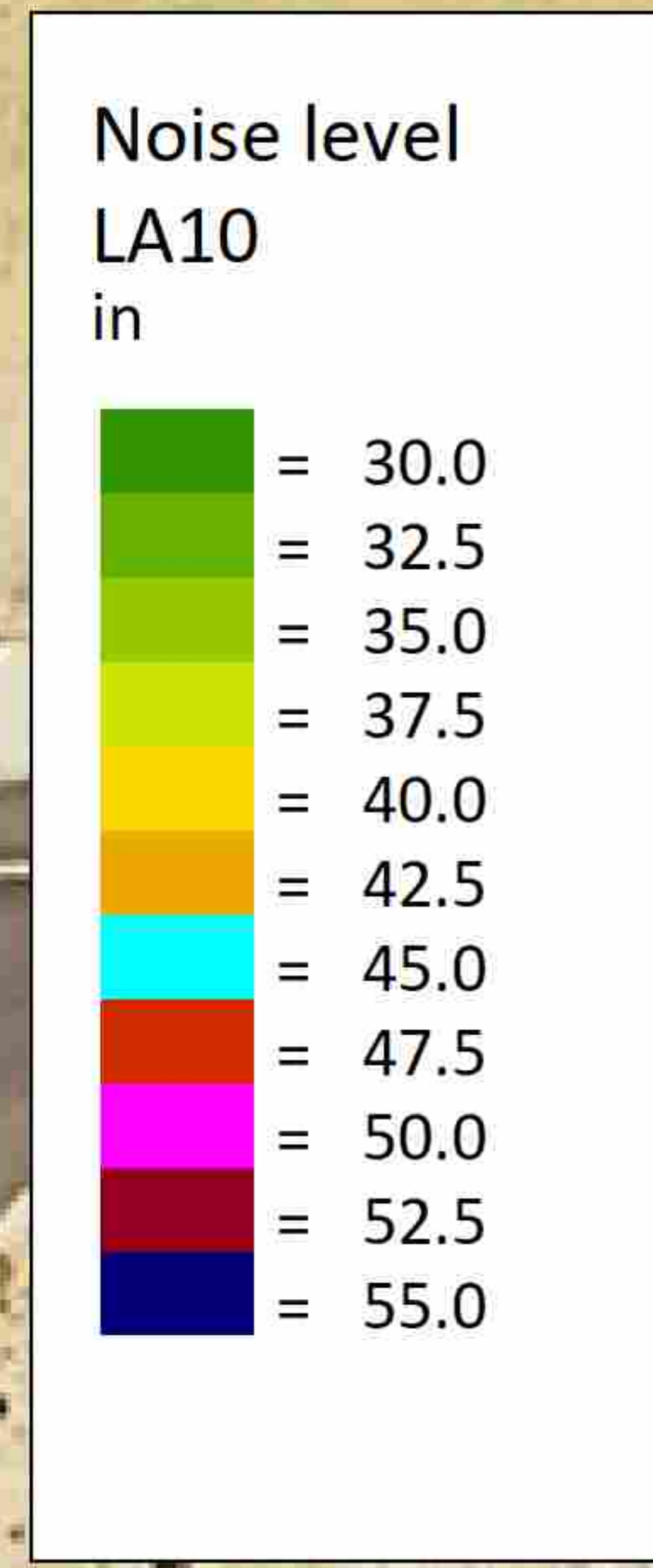
Herring Storer Acoustics
Job No : 21474
Date : 24 January 2022

PROPOSED CHILD CARE CENTRE
LOT 2035 (# 7) CRUSHING ROAD, ALKIMOS
OUTDOOR PLAY

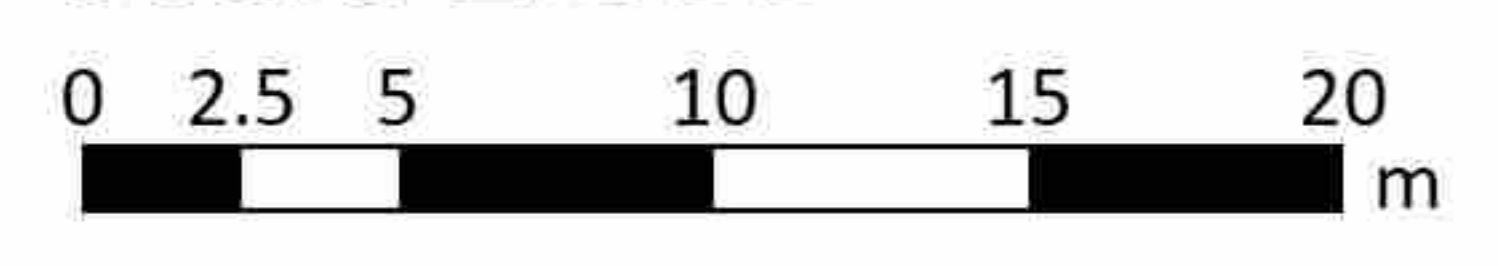
Figure B1
Appendix B



Magellan Road



Scale 1:500

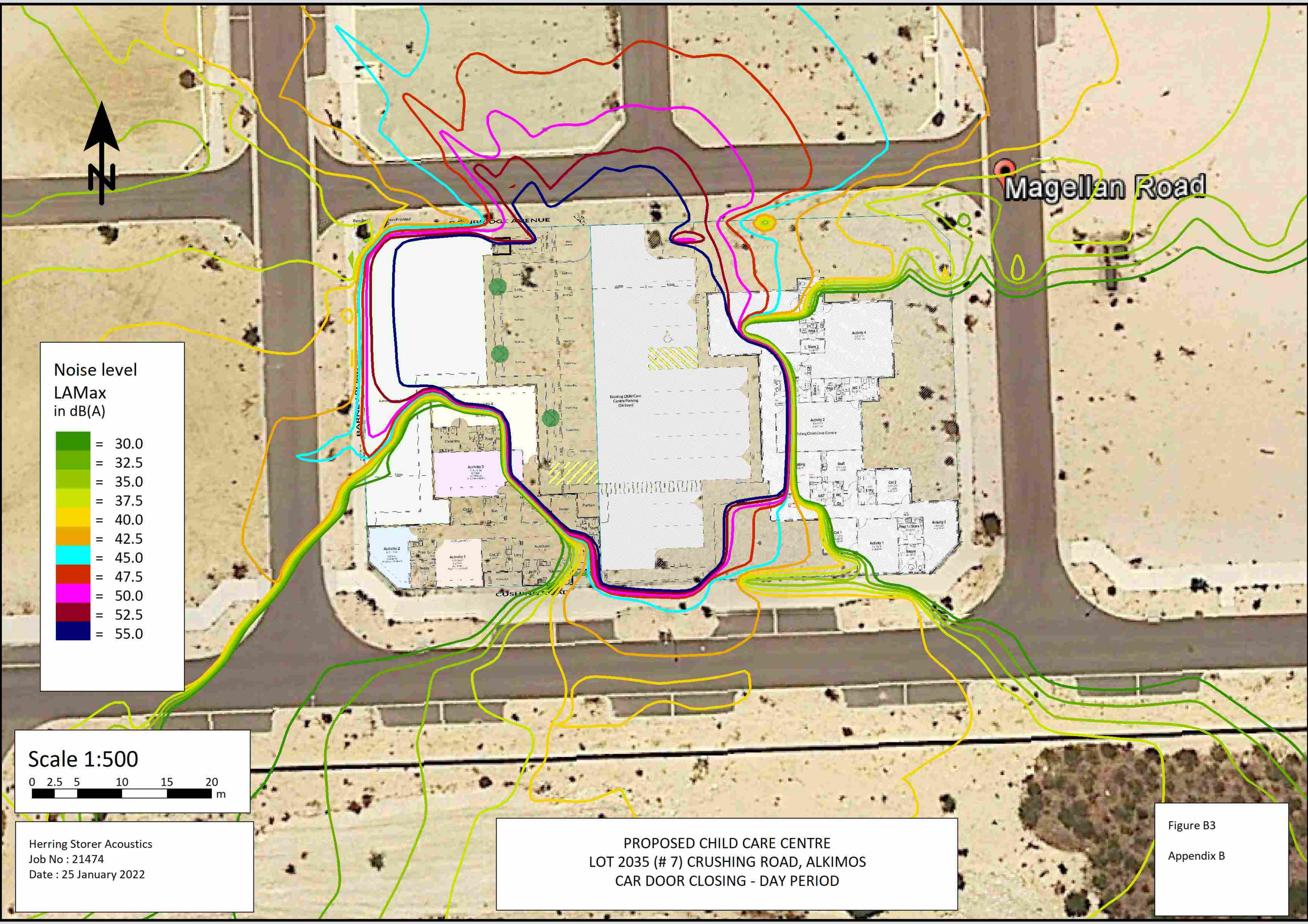


Note : Noise emissions from mechanical services is not cumulative (ie noise from existing services would not add to noise received at residence). Thus, only contours for the new proposal are shown for the mechanical services.

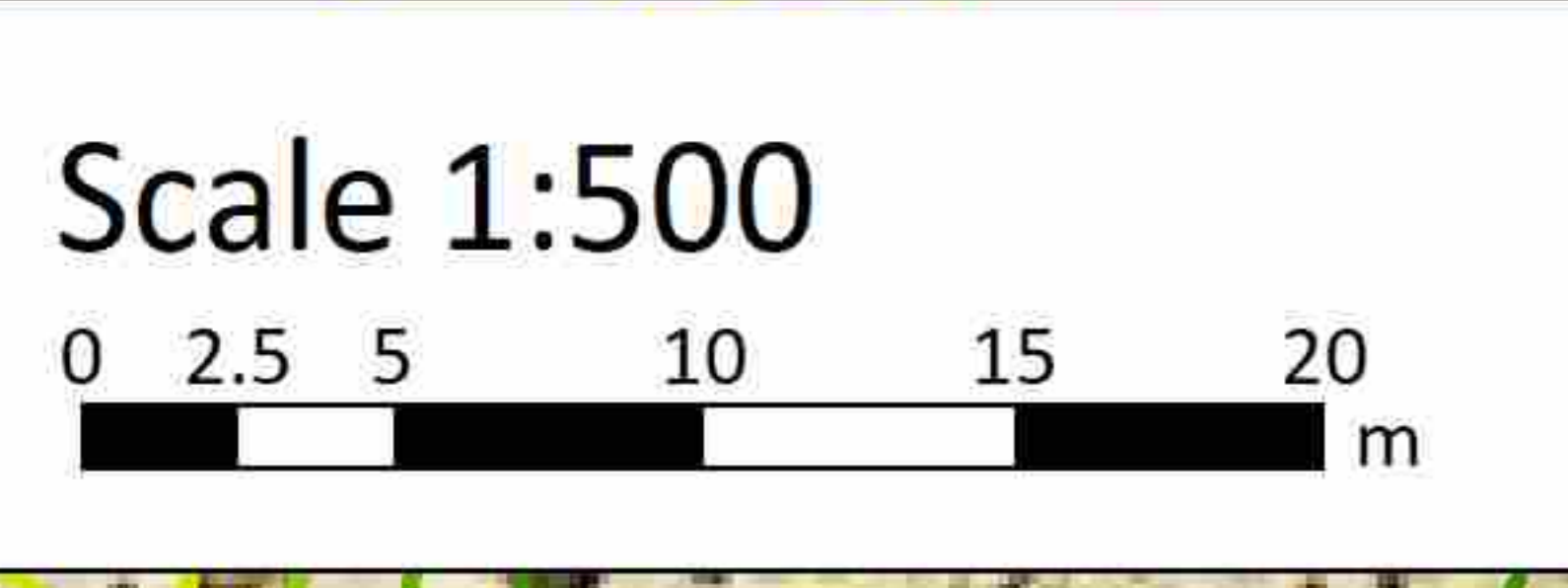
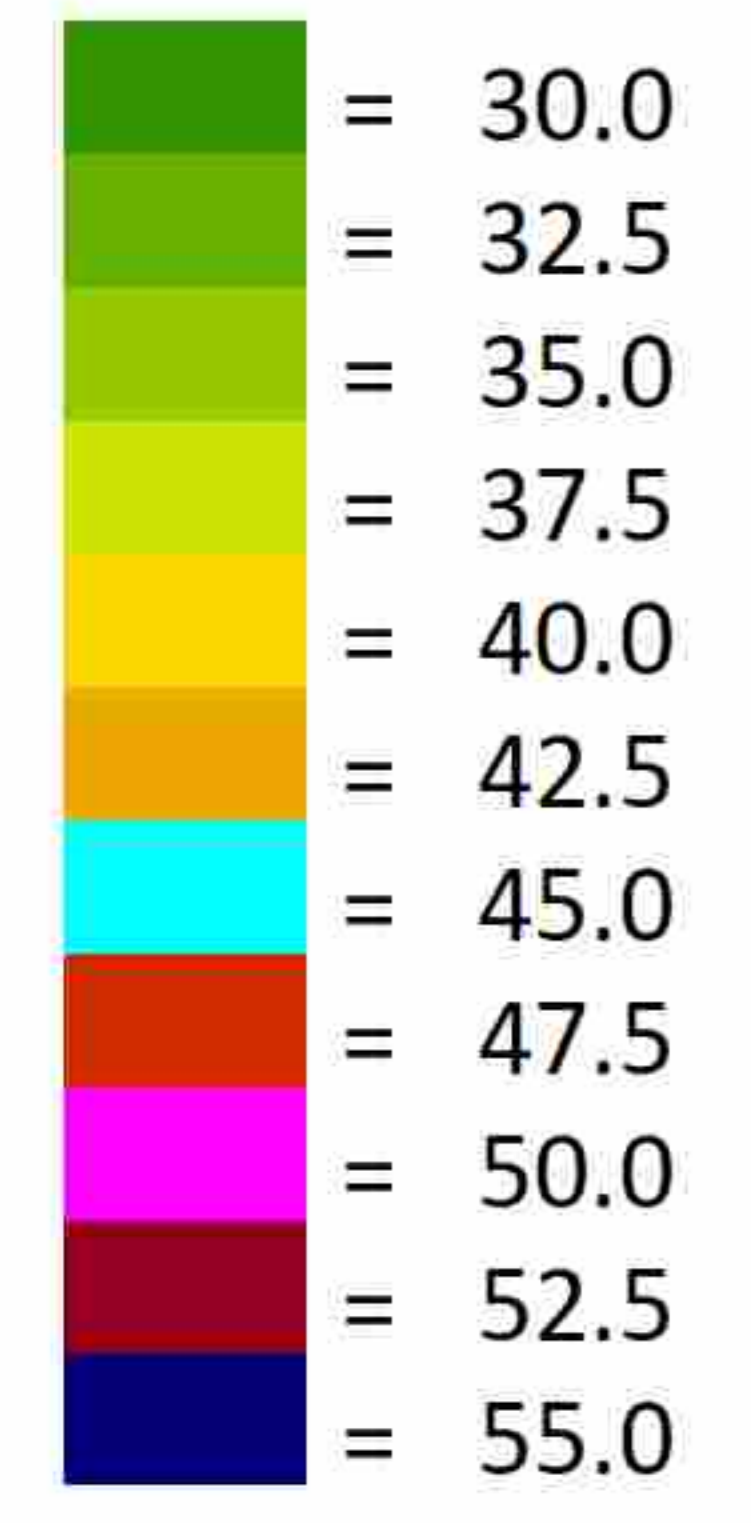
Herring Storer Acoustics
Job No : 21474
Date : 24 January 2022

PROPOSED CHILD CARE CENTRE
LOT 2035 (# 7) CRUSHING ROAD, ALKIMOS
OUTDOOR PLAY

Figure B2
Appendix B



Noise level
LAMax
in dB(A)

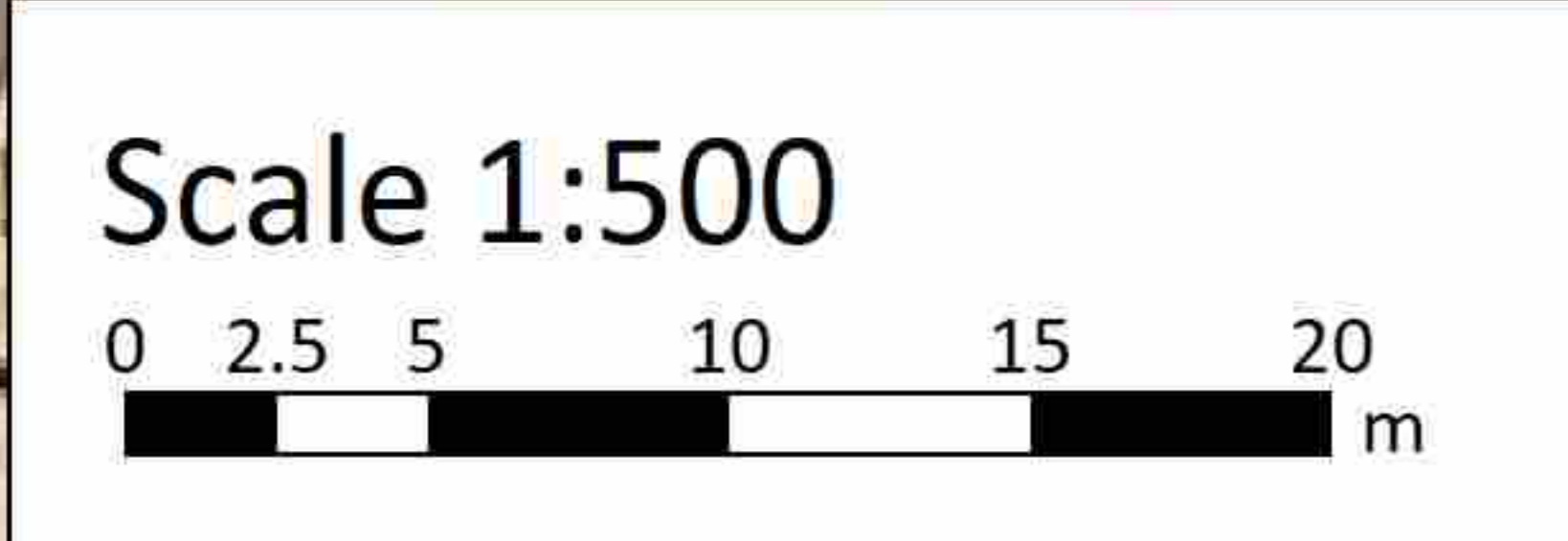
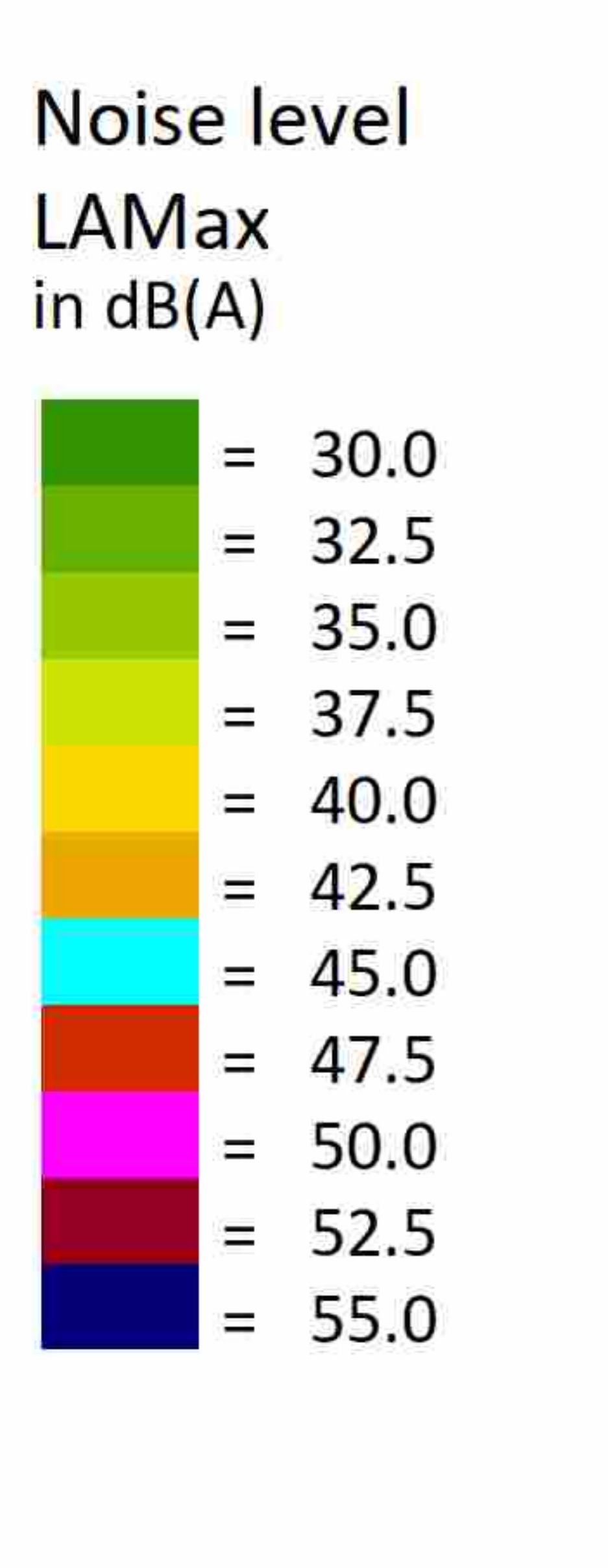


Herring Storer Acoustics
Job No : 21474
Date : 25 January 2022

PROPOSED CHILD CARE CENTRE
LOT 2035 (# 7) CRUSHING ROAD, ALKIMOS
CAR DOOR CLOSING - DAY PERIOD

Figure B3
Appendix B

Magellan Road



Herring Storer Acoustics
Job No : 21474
Date : 25 January 2022

PROPOSED CHILD CARE CENTRE
LOT 2035 (# 7) CRUSHING ROAD, ALKIMOS
CAR DOOR CLOSING - NIGHT PERIOD

Figure B4
Appendix B

