

**PROPOSED CHILD CARE CENTRE  
5 GRAYSWOOD COURT  
LANDSDALE**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

**SEPTEMBER 2021**

**OUR REFERENCE: 28250-1-21382**

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PROPOSED CHILD CARE CENTRE  
5 GRAYWOOD COURT, LANDSDALE

Job No: 21382

Document Reference : 28250-1-21382

FOR

**THE ATLANTIS GROUP**

**DOCUMENT INFORMATION**

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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 5 Grayswood Court, Landsdale.

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

The closest neighbouring residences would be located to the north, east and south. Noise received at these residences from the outdoor play areas would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, 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.

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 Fencing, as shown in 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 the development to be as shown Figure 5.1 in Section 5 - Modelling.
- 3 Door to be closed to activity space during periods of singing and / or when music is being played.

Thus, noise emissions from the proposed development, with the inclusion of the above be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*. For information, the suggested noise managements are :

- Children are not allowed within the outdoor play area prior to 0700 hours.
- NO music to be played outdoors.
- Music played indoors to be of a reasonable level, without heavy bass.
- Crying children will, depending in the circumstances, be taken inside in a reasonable time.

### 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 <sub>A10</sub>    | L <sub>A1</sub> | L <sub>Amax</sub> |
| 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<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> 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 <b>tonality</b> is present | Where <b>modulation</b> is present | Where <b>impulsiveness</b> 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 to the north, east and south. An aerial showing the neighbouring premises is shown below on Figure 3.1.



**FIGURE 3.1 – NEIGHBOURING LOTS**

At the neighbouring residence, the influencing factor has been determined to be +1 dB for the other neighbouring residences. Thus, the assigned noise levels would be as listed in Table 3.3.

**TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL (RESIDENCE R2)**

| Premises Receiving Noise  | Time of Day  | Assigned Level (dB) |                 |                   |
|---|--|---------------------|-----------------|-------------------|
|   |  | L <sub>A10</sub>    | L <sub>A1</sub> | L <sub>Amax</sub> |
| 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                |
| Noise sensitive premises: any area other than highly sensitive area | All hours  | 60                  | 75              | 80                |

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> 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 1800 hours, Monday to Friday (closed on Saturday, Sundays and public holidays). It is understood that the proposed childcare centre will cater for a maximum of 128 children, with the following breakdown of children :

|                  |   |    |
|------------------|---|----|
| Babies / Nursery | - | 28 |
| Toddlers         | - | 40 |
| Kindy            | - | 60 |

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 existing 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                 | 0 – 2 years - 78 (per 10 children)<br>Older than 2 years - 83 (per 10 children) |
| Car Moving in Car Park           | 79  |
| Car Starting                     | 85  |
| Door Closing                     | 87  |
| Air conditioning condensing Unit | 4 @ 71  |

Notes :

- 1 Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 120 children playing within the outdoor play areas at the one time, utilising the following groups :
  - 3 groups of 10 babies;
  - 4 groups of 10 children within the southern play area;
  - 4 groups of 10 children within the northern play area;
  - 1 group of 10 children around the veggie garden located near the northern boundary.
- 2 The building construction would be sufficient to contain noise generated internally and noise emissions from the outdoor playscape would be considered the worst case scenario. However, when music is played internally, the external doors to that activity room are to be closed.



- 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 It is recommended that the air conditioning condensing units be located on the eastern façade of Toddler 1 room.
- 5 The noise modelling has been based on the fencing indicated on the Figure 5.1.
- 6 To determine the restriction to the parking, a point noise source was located in each car bay.
- 7 Calculation were undertaken for the receivers at 1.5 metres above the ground level.
- 8 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.
- 9 All modelling has been undertaken to the “highly” noise sensitive area. However, to show compliance, noise modelling for car doors closing (being the critical noise source with regards to compliance) was also undertaken at the closest boundary to the car park for the neighbouring residences to the north and south.



FIGURE 5.1 – 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 |
| North                 | 46                             | 19 (24)          |
| East                  | 46                             | 25 (30)          |
| South                 | 46                             | 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)) |
|-----------------------|--------------------------------|
| North                 | 37                             |
| East                  | 34                             |
| South                 | 38                             |

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

| Neighbouring Premises           | Calculated Noise Level (dB(A)) |              |
|---------------------------------|--------------------------------|--------------|
|                                 | Car Starting                   | Door Closing |
| North                           |                                |              |
| "Highly" sensitive area         | 41                             | 42 [52]      |
| Boundary – Adjacent to car park | N/A                            | 55 [65]      |
| East                            | 40                             | 41 [50]      |
| South                           |                                |              |
| "Highly" sensitive area         | 43                             | 44 [54]      |
| Boundary                        | N/A                            | 49 [59]      |

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

Tables 6.4 to 6.8 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<br>dB(A) | Applicable Assigned Noise<br>Level (dB(A)) | Exceedance to Assigned<br>Noise Level |
|----------|---------------------------------|--|---------------------------------------|
| North    | 46                              | 46   | Complies                              |
| East     | 46                              | 46   | Complies                              |
| South    | 46                              | 46   | Complies                              |

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

| Location | Assessable Noise Level<br>dB(A) | Applicable Assigned Noise<br>Level (dB(A)) | Exceedance to Assigned<br>Noise Level |
|----------|---------------------------------|--|---------------------------------------|
| North    | 24                              | 36   | Complies                              |
| East     | 30                              | 36   | Complies                              |
| South    | 28                              | 36   | Complies                              |

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

| Location | Assessable Noise Level<br>dB(A) | Applicable Assigned Noise<br>Level (dB(A)) | Exceedance to Assigned<br>Noise Level |
|----------|---------------------------------|--|---------------------------------------|
| North    | 37                              | 46   | Complies                              |
| East     | 34                              | 46   | Complies                              |
| South    | 38                              | 46   | Complies                              |

**TABLE 6.7 – ASSESSMENT OF  $L_{Amax}$  NIGHT PERIOD NOISE LEVEL EMISSIONS  
 CAR STARTING**

| Location | Assessable Noise Level<br>dB(A) | Applicable Assigned Noise<br>Level (dB(A)) | Exceedance to Assigned<br>Noise Level |
|----------|---------------------------------|--|---------------------------------------|
| North    | 41                              | 56   | Complies                              |
| East     | 40                              | 56   | Complies                              |
| South    | 43                              | 56   | Complies                              |

**TABLE 6.8 – ASSESSMENT OF  $L_{Amax}$  NIGHT PERIOD NOISE LEVEL EMISSIONS  
 CAR DOOR**

| Location                                | Assessable Noise Level<br>dB(A) | Applicable Assigned Noise<br>Level (dB(A)) | Exceedance to Assigned<br>Noise Level |
|---|---------------------------------|--|---------------------------------------|
| North - "Highly" sensitive area         | 52                              | 56   | Complies                              |
| North – Boundary (Adjacent to car park) | 65                              | 80*  | Complies                              |
| East                                    | 50                              | 56   | Complies                              |
| South - "Highly" sensitive area         | 54                              | 56   | Complies                              |
| South – Boundary (Adjacent to car park) | 59                              | 80*  | Complies                              |

\*At All Times

## 7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level.

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

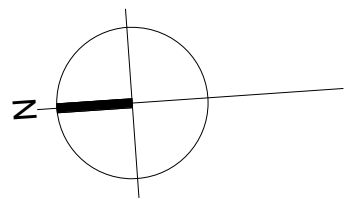
It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors is not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources would also comply with the 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.
- 2 The number of children within the northern outdoor play area be limited to 40 children within the play area and 10 children within the veggie garden area.
- 3 Fencing to the development to be as shown Figure 5.1 in Section 5 - Modelling.
- 4 Door to be closed to an activity space during periods of singing and / or when music is being played.

# **APPENDIX A**

## PLANS



# SITE PLAN

SCALE: 1 : 500

**PROPOSED CHILDCARE CONVERSION**  
 LOCATION: 5 GRAYWOOD COURT, LANDSDALE  
 FOR: HINDLE PROPERTIES PTY. LTD.

SK007  
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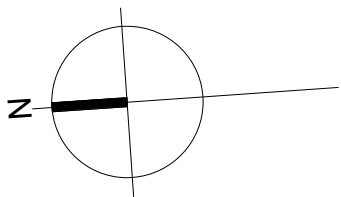
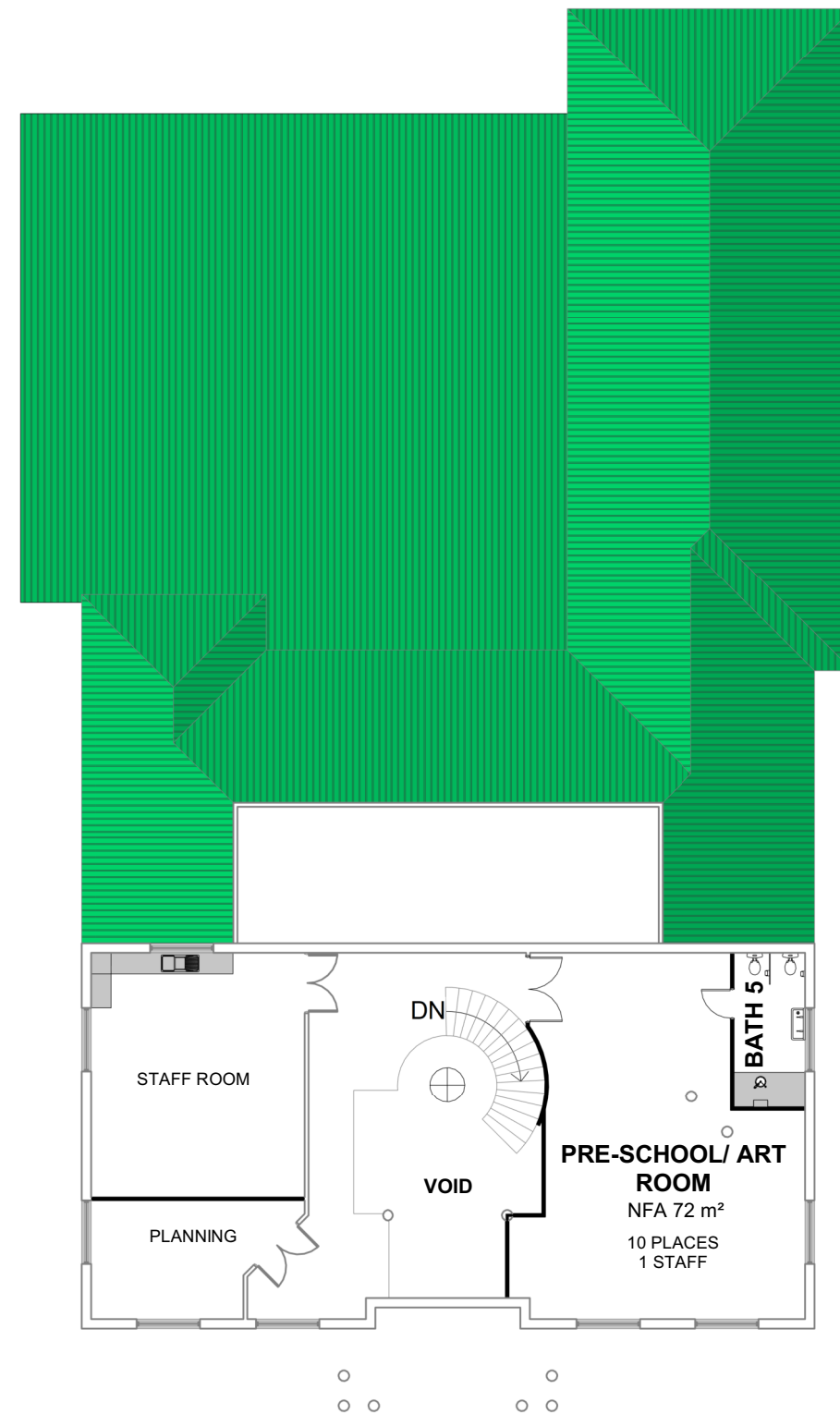
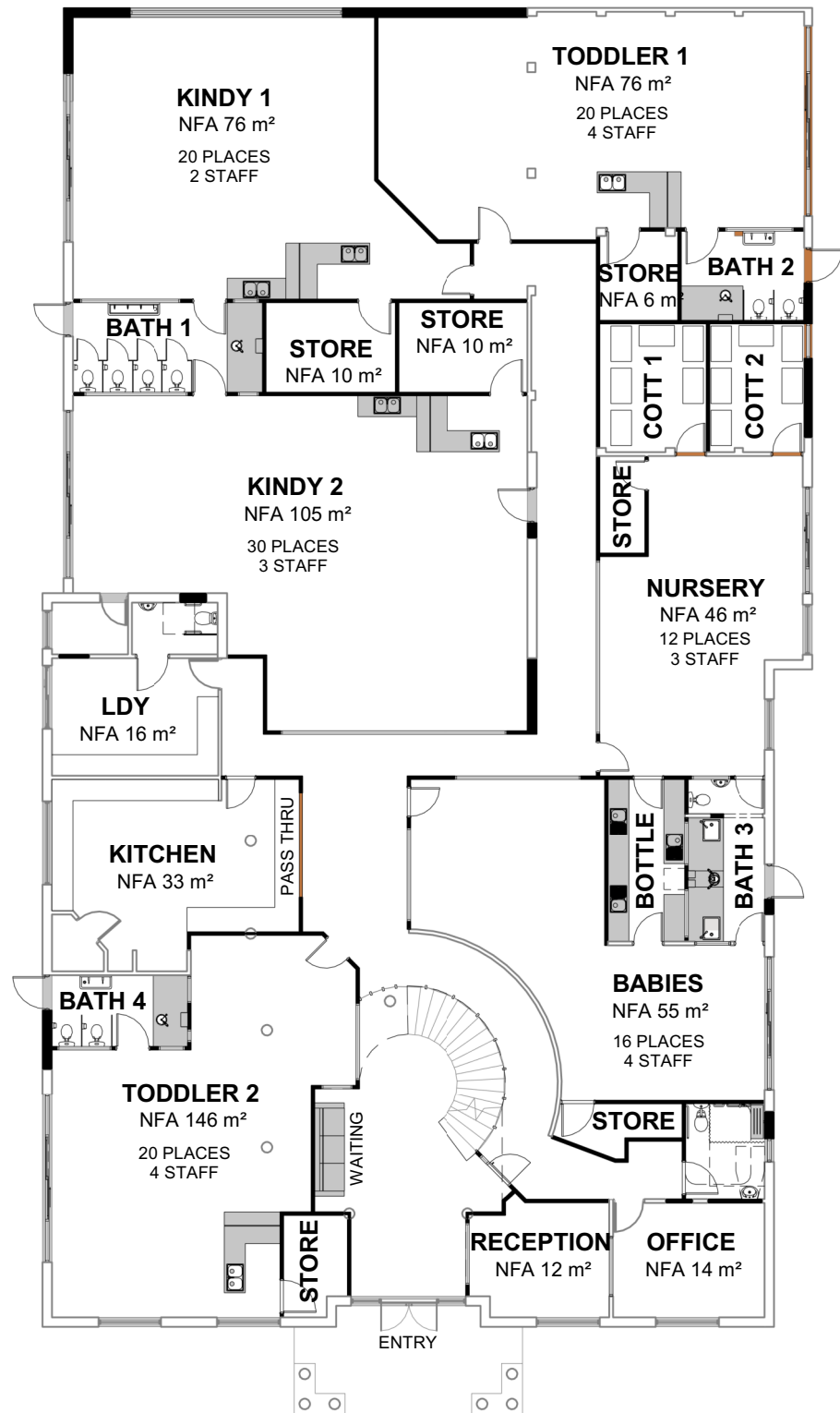
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## GROUND FLOOR PLAN

SCALE: 1 : 200

## FIRST FLOOR PLAN

SCALE: 1 : 200

**PROPOSED CHILDCARE CONVERSION**  
 LOCATION: 5 GRAYWOOD COURT, LANDSDALE  
 FOR: HINDLE PROPERTIES PTY. LTD.

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