

**PROPOSED CHILD CARE CENTRE
Lot 1 / 10 RUSSELL ROAD
MADELEY**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

JUNE 2023

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PROPOSED CHILD CARE CENTRE
MADELEY

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FOR

STRATEGIC PROPERTY GROUP

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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 Lot 1 / 10 Russell Road, Madeley.

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 area would comply with day period assigned noise level for the day period, with the fencing to be as shown on Figure 5.1 in Section 5 – Modelling.

The air conditioning condensing units, being located on the southern façade of the office / staff room, within the drying court and be screened with louvres from neighbouring premises, noise received at the neighbouring residences have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, although not required to achieve compliance, it is recommended that the air conditioning condensing units be installed with “low noise” night modes.

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 comply at all times, with the fencing to be as shown on Figure 5.1 in Section 5 – Modelling and the parking restrictions, as shown on Figure 5.2 in Section 5 – Modelling.

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 Figure 5.1 in Section 5 – Modelling. We note that for this development, colourbond is an acceptable fencing material.

- 3 The air conditioning condensing units located on the southern façade of the office / staff room, within the drying court and be screened with louvres from neighbouring premises.. Additionally. although not required to achieve compliance, it is recommended that the air conditioning condensing units be installed with “low noise” night modes.
- 4 As the air conditioning has not been design at this stage, it is recommended that the design be reviewed / assessed to ensure compliance with the Environmental Protection (Noise) Regulations 1997 are achieved and mitigation measures are as required for the final design.
- 5 For noise associated with cars within the car park to comply with the Regulations, parking restrictions, as shown as shown on Figure 5.2 in Section 5 – Modelling are required.

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
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.
 IF is the influencing factor.

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 existing neighbouring residences are located to the north, east and south of the proposed development. An aerial showing the neighbouring premises are shown below on Figure 3.1.



FIGURE 3.1 – NEIGHBOURING LOTS

At the neighbouring residences, given the zoning, 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

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 91 children: with the following breakdown:

Room 1	0 – 24 months	12 places
Room 2	24 – 36 months	20 places
Room 3	+ 3 years	30 places
Room 4	+ 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	83 (per 10 children)
Car Moving in Car Park	79
Car Starting	85
Door Closing	87
Air conditioning condensing Unit	5 @ 73

Notes:

- 1 Even though the noise emissions from children under the age of 2 years is relatively low compared to the other children, to be conservative, acoustic modelling of outdoor play noise was made, based on 90 children playing within the outdoor play areas at the one time, utilising 9 groups of 10 children, sound power levels distributed as plane sources.
- 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 development, it is recommended that the air conditioning condensing units would be located on the southern side of the office / staff room, within the drying court; and be screened with louvres from neighbouring premises. Although not required for compliance, it is recommended that the air conditioning condensing units are to be installed with “low Noise” night modes that reduce noise emission by at least 4 dB(A).
- 4 The noise modelling has been based on fencing, as shown on Figure 5.1. Other fencing not shown on Figure 5.1 can be as indicated on the plans attached in Appendix A.
- 5 For noise emissions from car doors to comply during the night period, restrictions to the parking during the night period (ie no parking before 7am), as shown on Figure 5.2 would be required.
- 6 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.

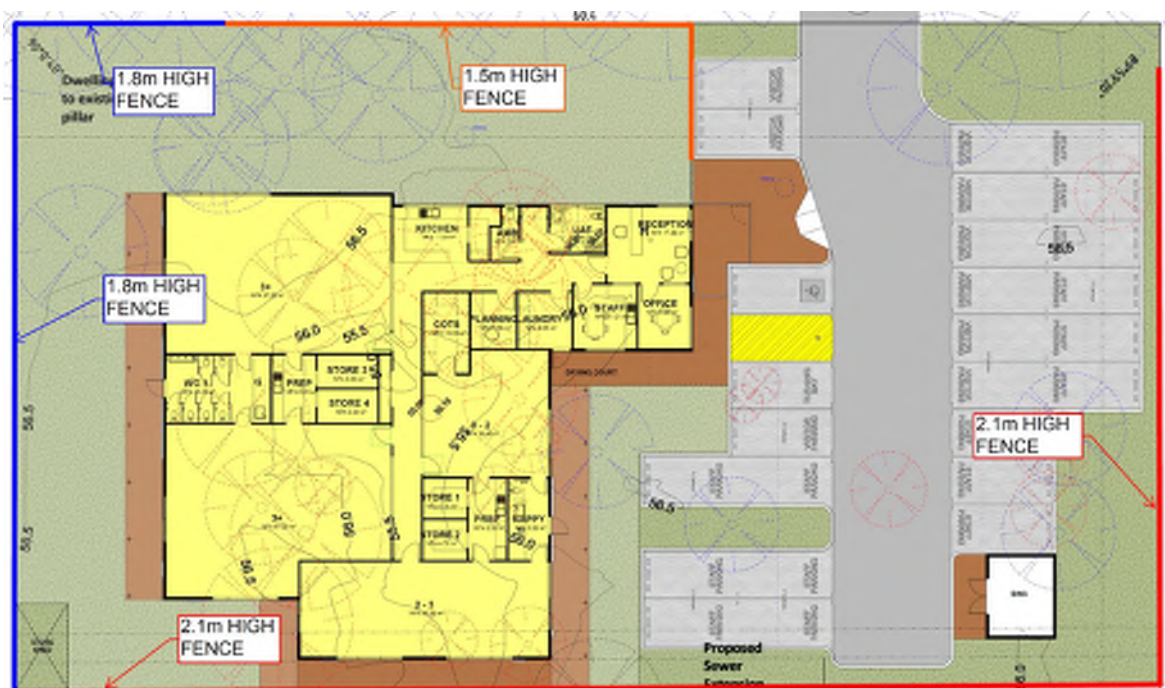


FIGURE 5.1 – BOUNDARY FENCING

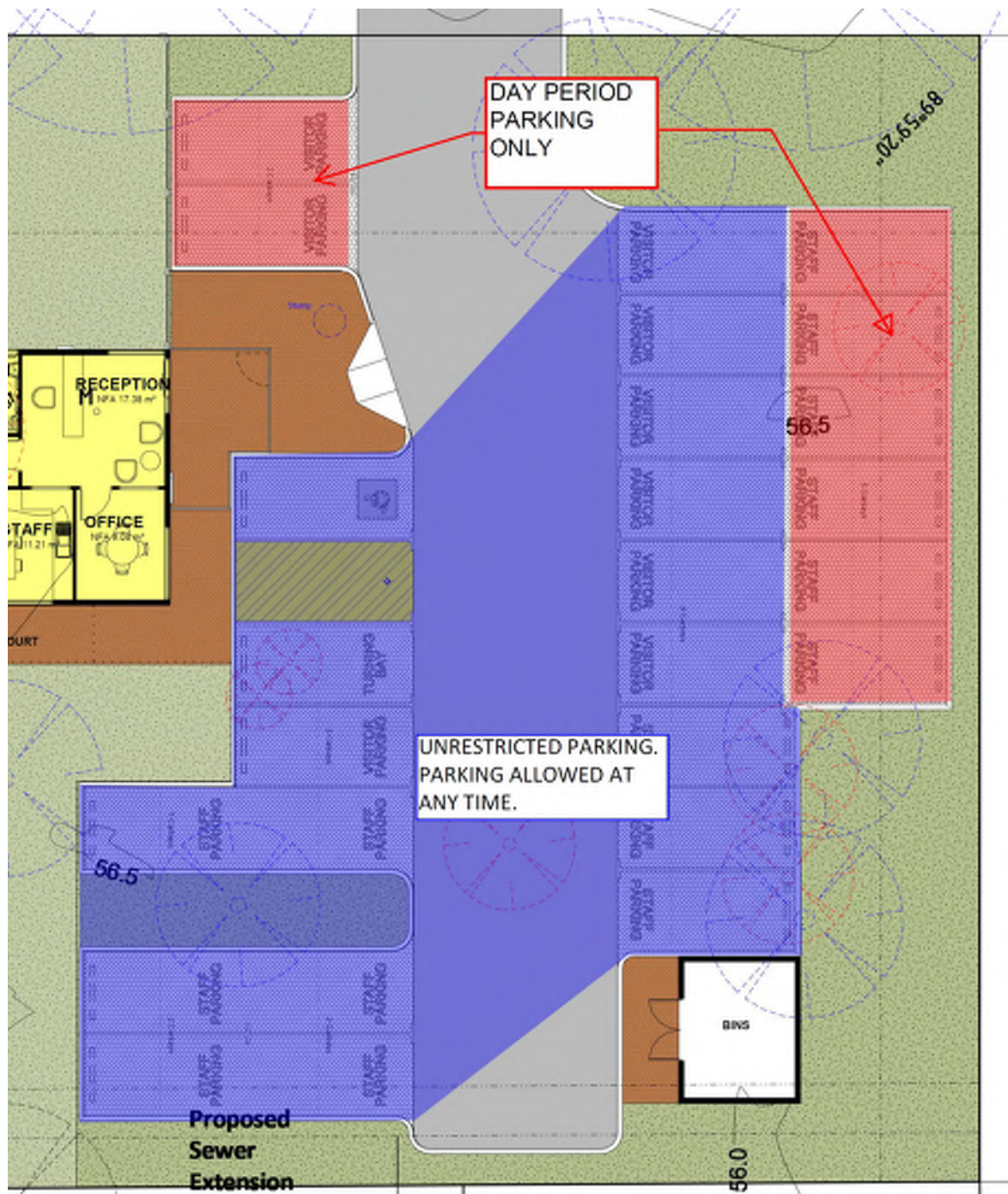


FIGURE 5.2 – PARKING RESTRICTIONS

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
North	46	22 (27)
East	36	25 (30)
South	46	28 (33)

() 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	43
East	41
South	44

**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
North	47	45	48 [58]	46 [56]
East	48	44	51 [61]	45 [54]
South	45	45	46 [56]	46 [56]

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

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
North	46	46	Complies
East	36	46	Complies
South	46	46	Complies

**TABLE 6.5 – ASSESSMENT OF L_{A10} NIGHT NOISE LEVEL EMISSIONS
 MECHANICAL SERVICES**

Location	Assessable Noise Level dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
North	27	36	Complies
East	30	36	Complies
South	33	36	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
North	43	46	Complies
East	41	46	Complies
South	44	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
North	47	66	Complies
East	48	66	Complies
South	45	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
North	45	56	Complies
East	44	56	Complies
South	45	56	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
North	58	66	Complies
East	61	66	Complies
South	56	66	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
North	56	56	Complies
East	54	56	Complies
South	56	56	Complies

7. CONCLUSION

Noise received at the neighbouring residences from the outdoor play area would comply with day period assigned noise level for the day period, with the fencing to be as shown on Figure 5.1 in Section 5 – Modelling.

The air conditioning condensing units, being located on the southern façade of the office / staff room, within the drying court and be screened with louvres from neighbouring premises, noise received at the neighbouring residences have also been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, although not required to achieve compliance, it is recommended that the air conditioning condensing units be installed with “low noise” night modes.

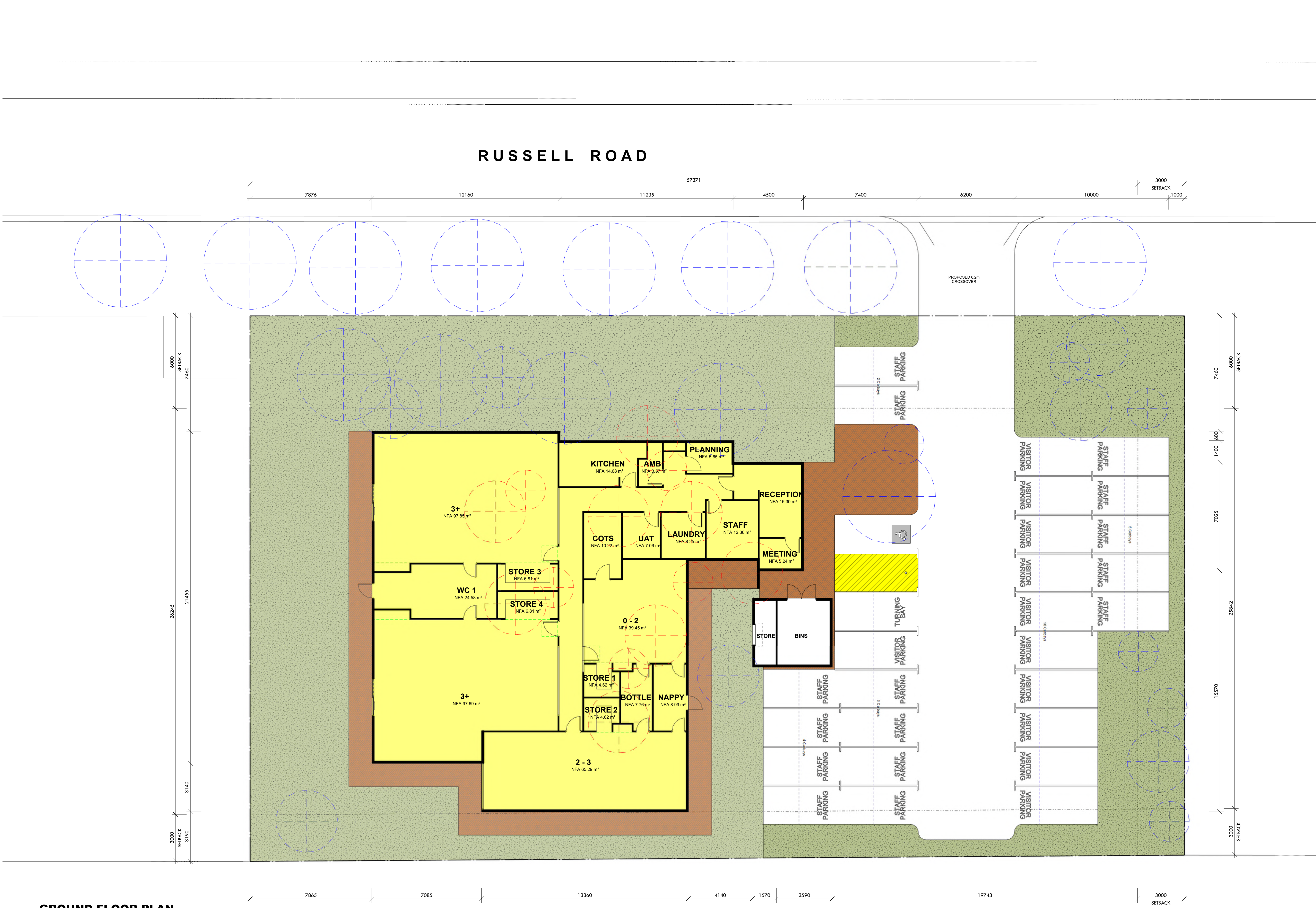
It is noted that noise associated with cars movements and cars starting are exempt from complying with the Regulations. However, noise emissions from car doors are not strictly exempt from the Regulations. Noise received at the neighbouring residences from these noise sources would comply at all times, with the fencing to be as shown on Figure 5.1 in Section 5 – Modelling and the parking restrictions, as shown on Figure 5.2 in Section 5 – Modelling.

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 Figure 5.1 in Section 5 – Modelling. We note that for this development, colourbond is an acceptable fencing material.
- 3 The air conditioning condensing units located on the southern façade of the office / staff room, within the drying court and be screened with louvres from neighbouring premises. Additionally, although not required to achieve compliance, it is recommended that the air conditioning condensing units be installed with “low noise” night modes.
- 4 As the air conditioning has not been design at this stage, it is recommended that the design be reviewed / assessed to ensure compliance with the Environmental Protection (Noise) Regulations 1997 are achieved and mitigation measures are as required for the final design.
- 5 For noise associated with cars within the car park to comply with the Regulations, parking restrictions, as shown as shown on Figure 5.2 in Section 5 – Modelling are required.

APPENDIX A

PLANS



GROUND FLOOR PLAN
SCALE: 1:100

SITE CRITERIA

1. Site Area		2115.3m²
a. Site Area		
2. Landscaping		211.5m²
a. Required 10% of Site Area		
b. Provided		
Soft		787 m ² (37.2%)
Hard		157 m ²
	Total	944 m²
3. Floor Area (GFA)	Total	529m²
4. Carparking		
i. Cars Required		
a. 1:1 Staff		15 Staff Cars
b. 1:10 Kids		9.2 Visitors cars
Total Car required		24.2 Cars
ii. Cars Provided		
a. Staff		15 Cars
b. Visitors		12 Cars
		27 Cars

CHILD CARE CRITERIA

1. Centre capacity		92 places
a. Number of places		
2. Landscaping		644m²
a. Required 7m ² :1 child		986m ²
b. Provided		7.45 m ²
	Total m² provided per child	
3. Floor Area (GFA)		296m²
a. Area required		300.3m ²
b. Area provided		
4. Room distribution		
a. Room 0-24 m		12 Places
Number of places		
Staff required	1:4 Staff	3 Staff
b. Room 24 - 36 m		20 Places
Number of places		
Staff required	1:5 Staff	4 Staff
c. Room +3y		30 Places
Number of places		
Staff required	1:10 Staff	3 Staff
d. Room +5y		30 Places
Number of places		
Staff required	1:10 Staff	3 Staff
	Total places	92 Places
	Total Staff (+2 Staff (Chef, Manager))	15 Places

Landscaping
A. Hard Landscaping
Defined as paved walkways either open or covered.
B. Soft Landscaping
Defined as vegetative landscaping.

Gross Floor Area (GFA)
A. All floor areas on this plan are shown as GROSS FLOOR AREA.
Unless otherwise noted as Net Floor Area
B. Definition of Gross Floor Area is defined as:
i. GROSS FLOOR AREA OF TENANCY
Gross Floor Area of an individual Tenancy is defined as the area contained between the centre line of common tenancy walls and the outside edge of external walls.
ii. GROSS FLOOR AREA OF A BUILDING
Gross Floor Area of a building is defined as the total area contained between the outside edge of external walls.

Net Floor Area (NFA)
A. Net Floor Area of a Tenancy on this plan is defined as the area between external or tenancy dividing walls.
B. This area is inclusive of toilets if the toilets are exclusive to the Tenancy.

SITE DESIGN CHECKLIST

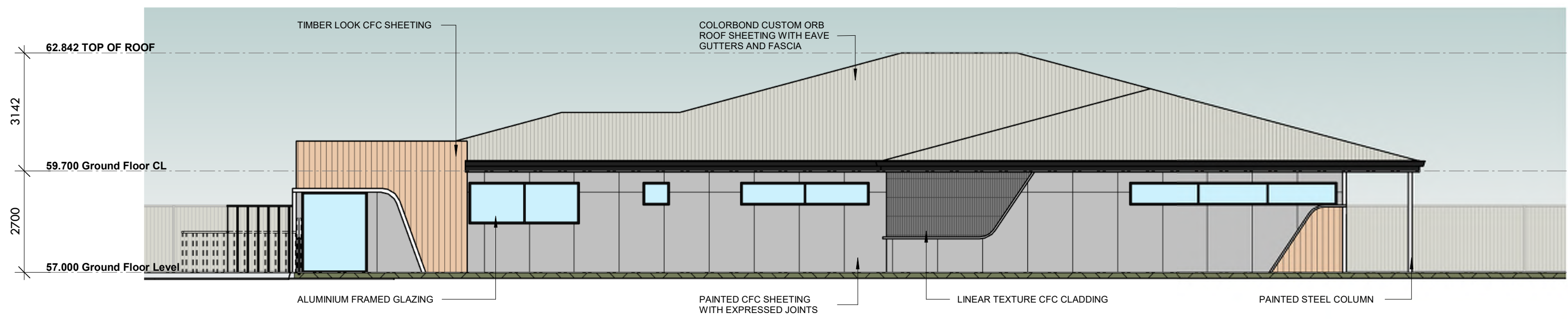
- 1. SEWER MAINS LOCATION TO BE DETERMINED
- 2. FIRE MAINS PRESSURE TEST REQUIRED
- 3. FIRE TANKS OR PUMPS TO BE DETERMINED
- 4. WESTERN POWER TRANSFORMER LOCATION TO BE DETERMINED
- 5. CROSSOVER & ACCESS TO STREET TO BE DETERMINED BY LOCAL AUTHORITY
- 6. FULL FEATURE SITE SURVEY REQUIRED
- 7. DIAL BEFORE YOU DIG REQUIRED
- 8. BUSHFIRE ATTACK LEVEL (BAL) TO BE DETERMINED
- 9. STREET POWER POLES TO BE DETERMINED
- 10. SITE ZONING & USE TO BE DETERMINED

NOTE: Any of the following items that do not have an 'X' in the provided square require determination.

LEGEND

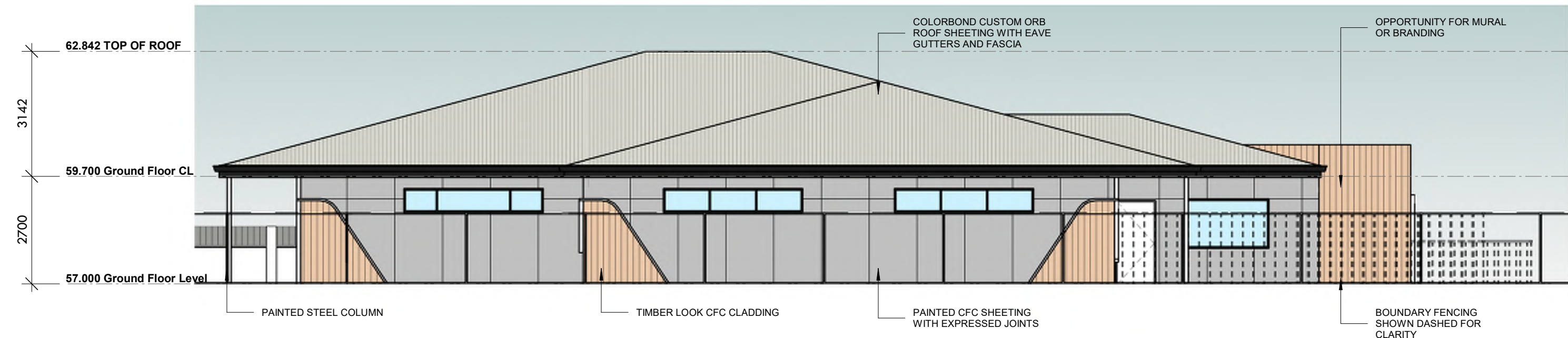
- BUILDING FOOTPRINT
- EXTENT OF BITUMEN PAVING
- EXTENT OF BRICK PAVING / CONCRETE PAVING
- EXTENT OF LANDSCAPING
- RETAIN TREE
- REMOVE/RELOCATE TREE

PRELIMINARY



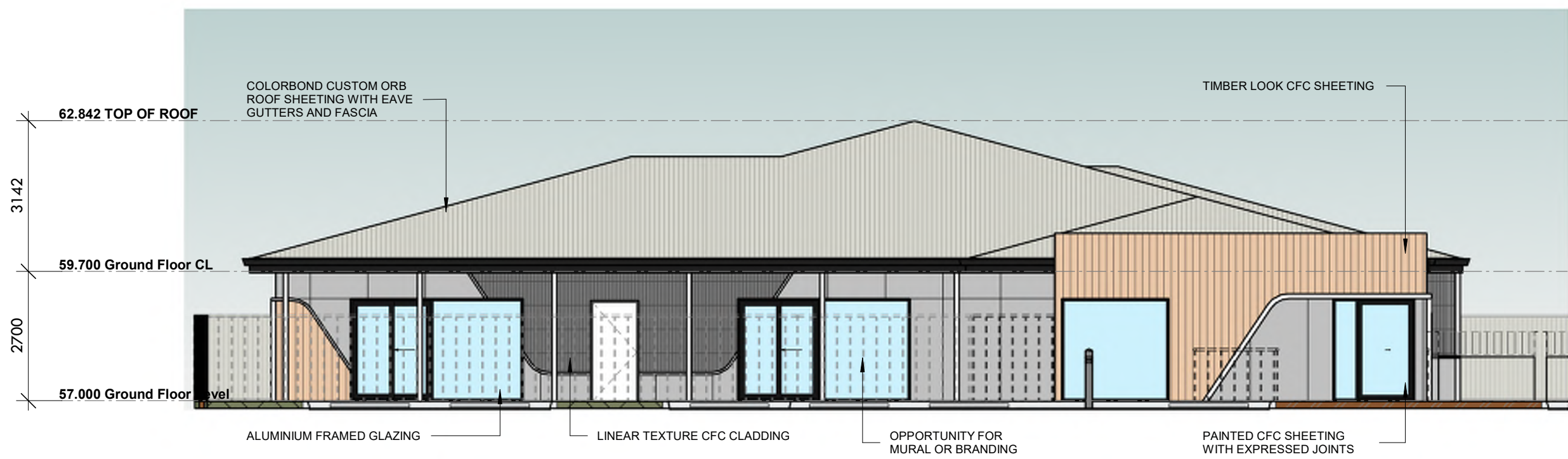
NORTH ELEVATION

SCALE: 1 : 100



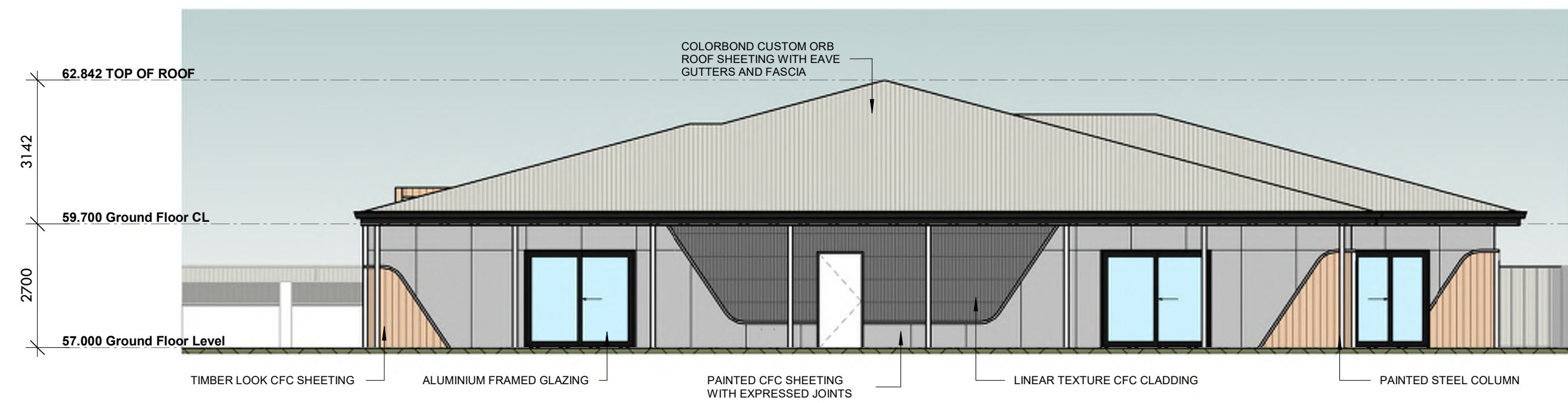
SOUTH ELEVATION

SCALE: 1 : 100



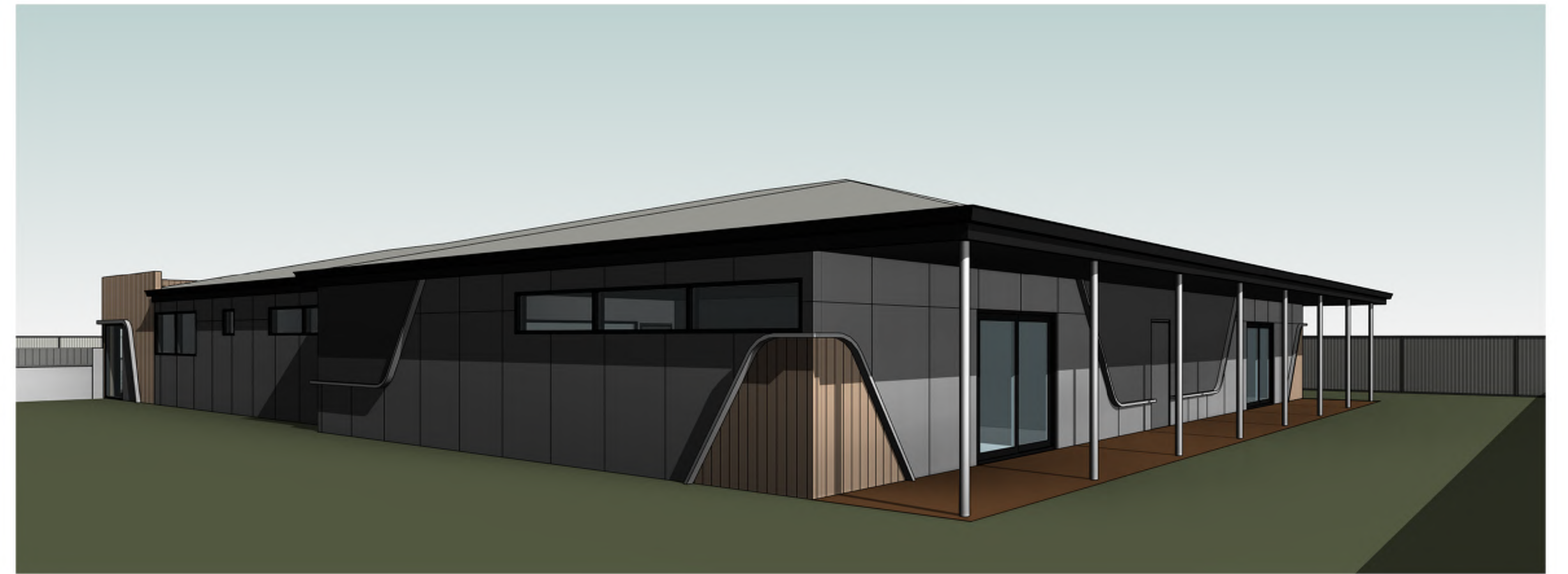
EAST ELEVATION

SCALE: 1 : 100



WEST ELEVATION

SCALE: 1 : 100



PRELIMINARY