

**PROPOSED COMMUNITY FACILITY
LOT 213 (#28) LEWIS ROAD
WATTLE GROVE**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

DECEMBER 2018

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ENVIRONMENTAL ACOUSTIC ASSESSMENT
COMMUNITY FACILITY
WATTLE GROVE

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FOR

HARLEY DYKSTRA

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by the Harley Dykstra to undertake an acoustic assessment of noise emissions associated with the proposed community facility, located at Lot 213 (#28) Lewis Road, Wattle Grove.

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 the facility, including :

- Mechanical services; and
- Vehicle movements within parking area and includes car starts and doors closing.

Additionally, from the drawings supplied, we understand that the main windows on the south east façade of the main hall are openable. Thus, an assessment of noise breakout from the main hall has also been undertaken.

For reference, a site plan and building plan are attached in Appendix A.

2. SUMMARY

From information supplied, it is understood that the facility would be used between 7am and 10pm on weekdays and Saturdays, and from 9am to around 3pm on Sundays. It is noted that the largest group of around 200 - 250 people would be between 9am and 3pm on Sundays. Therefore, the Sunday day period would be considered the worst case with regards to compliance with the *Environmental Protection (Noise) Regulations 1997*, thus with compliance achieved for this period, compliance would also be achieved for all other usages.

Based on the analysis of noise emissions from the proposed community facility, noise received at the neighbouring premises would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, provided that :

- the mechanical services condensing units are located on the south eastern façade of the development.
- all glazing to the main hall to be as a minimum 10.5mm thick laminated glass.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility are prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are 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

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.
Highly sensitive area is within 15m of the building on the premises that is noise sensitive.

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 –

- (b) is more than 3 dB L_{Afast} or is more than 3 dB L_{Afast} in any one-third octave band;
- (c) is present for more at least 10% of the representative assessment period; and
- (d) 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.

Where the noise emission is music, if the music is audible, then any measured level is adjusted according to Table 3.3 below.

TABLE 3.3 – ADJUSTMENTS TO MEASURED MUSIC NOISE LEVELS

Where impulsiveness is not present	Where impulsiveness is present
+10 dB(A)	+15 dB(A)

At the neighbouring residences located at 20 and 38 Lewis Road, the influencing factor has been determined at +6 dB, they are within 100 metres of a major road (Welshpool Road). For the other neighbouring residences the influencing factor would be +4 dB, as Lewis Road is a secondary road. Thus, the assigned noise levels would as listed in Tables 3.4 and 3.5.

**TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL
20 AND 38 LEWIS ROAD**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Noise sensitive premises : highly sensitive area	0700 - 1900 hours Monday to Saturday (DAY)	51	61	71
	0900 - 1900 hours Sunday and Public Holidays (EVENING)	46	56	71
	1900 - 2200 hours all days (NIGHT)	46	56	61
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (SUNDAY/PUBLIC HOLIDAY DAY)	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.

**TABLE 3.5 - ASSIGNED OUTDOOR NOISE LEVEL
RESIDENCES LOCATED ON NORTH WESTERN SIDE OF LEWIS ROAD**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _A 10	L _A 1	L _A max
Noise sensitive premises : highly sensitive area	0700 - 1900 hours Monday to Saturday (DAY)	49	59	69
	0900 - 1900 hours Sunday and Public Holidays (EVENING)	44	54	69
	1900 - 2200 hours all days (NIGHT)	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (SUNDAY/PUBLIC HOLIDAY DAY)	39	49	59

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.

For information, an aerial showing the development site and neighbouring premises is shown below on Figure 01.



FIGURE 01 – AERIAL

4. PROPOSAL

From information supplied, it is understood that the facility would be used between 7am and 10pm on weekdays and Saturdays, and from 9am to around 3pm on Sundays. It is noted that the largest group of around 200 - 250 people would be between 9am and 3pm on Sundays. Therefore, the Sunday day period would be considered the worst case with regards to compliance with the *Environmental Protection (Noise) Regulations 1997*, thus with compliance achieved for this period, compliance would also be achieved for all other usages.

From information provided, we understand that during main service on Sundays, a worship band performs, as well as singing. Therefore, an assessment of noise breakout from the main hall has also been undertaken.

For reference, a site plan is attached in Appendix A.

5. MODELLING

To assess the noise received at the neighbouring residences from the proposed community facility, noise modelling was undertaken using the noise modelling program SoundPlan.

By utilising acoustic modelling, the propagation of noise to nearby residences has been determined taking into account attenuation due to distance, ground absorption and any barrier affects due to fences, buildings or the like. Also, modelling was undertaken using DWER worst case weather conditions.

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 Noise Level, dB(A)
Singing with band within Main Hall	101
Car Starting	85
Car Moving in Car Park	76
Door Closing	87
Air conditioning condensing Unit	2 @ 72 and 3 @ 76

The above noise sources need to comply with the following assigned noise levels :

L _{A10}	-	Mechanical services and singing.
L _{A1}	-	Car Movements, ordering speaker and voices.
L _{AMax}	-	Car starts and doors closing.

At this stage of the development the mechanical services have not been designed. Therefore, the noise sources have been based on designs used for the same or similar developments. Noise associated with the mechanical services does not take into account any diversity of operation. Thus, this is a conservative assessment. The assessment has been based on the mechanical services condensing units being located on the south eastern façade, with 2 units located adjacent to the children's room; and the other condensing units located adjacent to store 1.

6. ASSESSMENT

Given the operating times, noise emissions from the community facility need to comply with the acoustic criteria for the evening period and Sunday day period.

Assessment of the noise breakout from the Main Hall with music was undertaken and to achieve compliance, the glazing to the Main Hall needs to be 10.5mm laminated glass.

The results of the noise modelling for the air conditioning condensing units and breakout due from the main hall (with windows both open and shut) are also shown in Table 6.1.

A separate scenario of noise from cars was based on a car moving within the parking area. The resultant noise levels are tabulated in Tables 6.2 and 6.3.

**TABLE 6.1 - ACOUSTIC MODELLING RESULTS FOR L_{A10} CRITERIA
SINGING IN MAIN HALL AND MECHANICAL PLANT**

Neighbouring Residence	Calculated Noise Level (dB(A))	
	Main Hall With Band	Mechanical Services
20 Lewis Road	24 [34]	34 (39)
38 Lewis Road	22 [32]	28 (33)
36 Lewis Road	31 [41]	36 (41)
37 Lewis Road	22 [32]	25 (30)
33 Lewis Road	23 [33]	26 (31)
29 Lewis Road	18 [28]	25 (30)
25 Lewis Road	15 [25]	21 (26)

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

[] Includes +10 dB(A) penalty for music

Notes:

- The influencing Factor for 20 and 38 Lewis Road is +6 dB, with the influencing factor for all other neighbouring residences being +4 dB.
- Singing is not impulsive, thus the adjustment for music for this development would be +10 dB.
- Noise emissions from the mechanical services would be tonal and a +5 dB(A) penalty would be applicable

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

Location	Calculated Noise Level (dB(A))
20 Lewis Road	45 (50)
38 Lewis Road	27 (32)
36 Lewis Road	34 (39)
37 Lewis Road	31 (36)
33 Lewis Road	34 (39)
29 Lewis Road	36 (41)
25 Lewis Road	34 (39)

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

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

Location	Calculated Noise Level (dB(A))	
	Car Starting	Door Closing
20 Lewis Road	50 (55)	51 [61]
38 Lewis Road	36 (41)	37 [47]
36 Lewis Road	45 (50)	47 [57]
37 Lewis Road	40 (45)	41 [51]
33 Lewis Road	41 (46)	43 [53]
29 Lewis Road	42 (47)	44 [54]
25 Lewis Road	41 (46)	42 [52]

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

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

Notes :

- Noise emissions from the cars starting would be tonal and a +5 dB(A) penalty would be applicable.
- Noise emissions from a car door closing, at the neighbouring premises could be impulsive and to be conservative, the +10 dB(A) penalty has been applied to the calculated noise level.

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
MUSIC (BAND)**

Source	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
20 Lewis Road	34	46	Complies
38 Lewis Road	32	46	Complies
36 Lewis Road	41	44	Complies
37 Lewis Road	32	44	Complies
33 Lewis Road	33	44	Complies
29 Lewis Road	28	44	Complies
25 Lewis Road	25	44	Complies

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

Source	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
20 Lewis Road	39	46	Complies
38 Lewis Road	33	46	Complies
36 Lewis Road	41	44	Complies
37 Lewis Road	30	44	Complies
33 Lewis Road	31	44	Complies
29 Lewis Road	30	44	Complies
25 Lewis Road	26	44	Complies

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

Source	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
20 Lewis Road	50	56	Complies
38 Lewis Road	32	56	Complies
36 Lewis Road	39	54	Complies
37 Lewis Road	36	54	Complies
33 Lewis Road	39	54	Complies
29 Lewis Road	41	54	Complies
25 Lewis Road	39	54	Complies

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

Source	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
20 Lewis Road	55	61	Complies
38 Lewis Road	41	61	Complies
36 Lewis Road	50	57	Complies
37 Lewis Road	45	57	Complies
33 Lewis Road	46	57	Complies
29 Lewis Road	47	57	Complies
25 Lewis Road	46	57	Complies

TABLE 6.8 – ASSESSMENT OF $L_{A\text{Max}}$ NOISE LEVEL EMISSIONS
CAR DOOR CLOSING

Source	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
20 Lewis Road	61	61	Complies
38 Lewis Road	47	61	Complies
36 Lewis Road	57	57	Complies
37 Lewis Road	51	57	Complies
33 Lewis Road	53	57	Complies
29 Lewis Road	54	57	Complies
25 Lewis Road	52	57	Complies

7. CONCLUSION

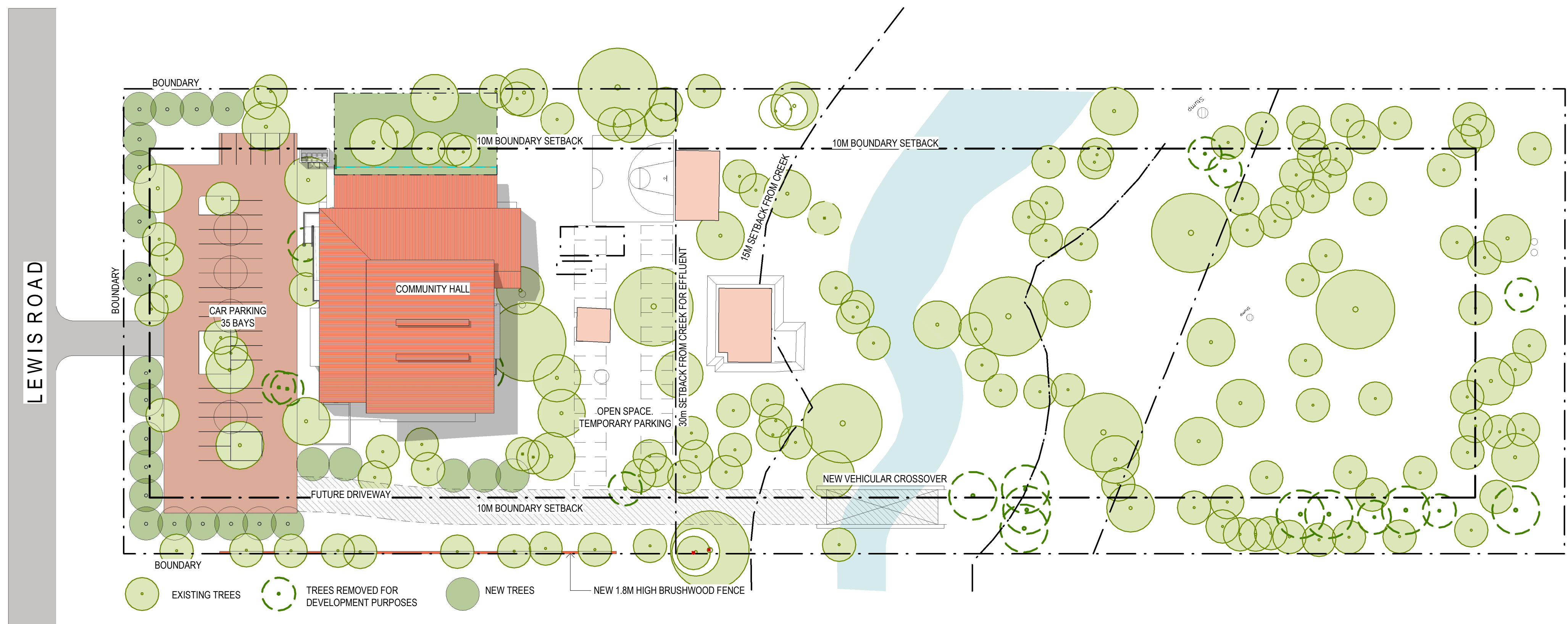
Given the proposed hours of operation, noise received at the neighbouring residence needs to comply with the assigned noise levels during the evening period and during the day on Sundays.

Based on the analysis of noise emissions from the proposed community facility, noise received at the neighbouring premises would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed hours of operation, provided that :

- the mechanical services condensing units are located on the south eastern façade of the development.
- all glazing to the main hall to be as a minimum 10.5mm thick laminated glass.

APPENDIX A

PLANS



COMMUNITY HALL DEVELOPMENT

FOUNT OF LIFE SANCTUARY INC

LOT 213, 28 LEWIS ROAD, WATTLE GROVE

SITE PLAN

DEVELOPMENT APPLICATION

peter hunt architect

Scale 1 : 500@ A1

0 25 50

29/11/2018 REV 3 **DA100**

COMMUNITY HALL DEVELOPMENT

FOUNT OF LIFE SANCTUARY INC

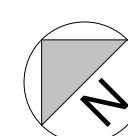
LOT 213, 28 LEWIS ROAD, WATTLE GROVE

SITE PLAN

DEVELOPMENT APPLICATION

peter hunt architect

Scale 1 : 200@ A1



29/11/2018 **REV 4**

DA101



APPROXIMATE ROOM NET AREA	
Name	Area
MAIN HALL	349 m²
FOYER 1	156 m²
FOYER 2	102 m²
KITCHEN	52 m²
STAFF OFFICE	16 m²
OFFICE	22 m²
CRECHE	22 m²
YOUTH	51 m²
CHILDREN	55 m²
CLNR	2 m²
UAC	6 m²
MALE	13 m²
FEMALE	13 m²
STORE 1	27 m²
STORE 2	18 m²
Total: 15	904 m²

GROSS AREA
BUILDING AREA | 1086m²
VERANDAH AREA | 280 m²

COMMUNITY HALL DEVELOPMENT

FOUNT OF LIFE OUTREACH MINISTRIES INC

LOT 213, 28 LEWIS ROAD, WATTLE GROVE

FLOOR PLAN

DEVELOPMENT APPLICATION

peter hunt architect

Scale 1 : 100@ A1



02/11/2018 REV 2

DA200