

**PROPOSED CHILD CARE CENTRE
10 HARBOUR ELBOW
BANKSIA GROVE**

ENVIRONMENTAL ACOUSTIC ASSESSMENT

MARCH 2019

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PROPOSED CHILD CARE CENTRE
10 HARBOUR ELBOW, BANKSIA GROVE

Job No: 18086

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FOR

THE ATLANTIS GROUP

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by The Atlantis Group to undertake an acoustic assessment of noise emissions associated with the proposed child care centre located at 10 Harbour Elbow, Banksia 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 :

- 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.

2. SUMMARY

We understand that it is proposed that the proposed child care centre would only operate between 6:30am and 6:00pm, Monday to Friday and would cater for up to 92 children.

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. 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 would, with the inclusion of the 1.8 metre high fences to the northern and southern boundaries, as shown on the landscape plan attached in Appendix A comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, for the proposed hours of operation.

Noise from the mechanical services has been assessed to also comply with the relevant assigned noise levels.

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.

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, an 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 0 dB for the residence to the east (R2) and +1 dB for the other neighbouring residences. Thus, the assigned noise levels would be as listed in Tables 3.3 and 3.4.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL (RESIDENCE R2)

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	55	65
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40	50	66
	1900 - 2200 hours all days (Evening)	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35	45	55
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.

TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL (RESIDENCES R1, R3-R6)

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
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.

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 92 children, with the following breakdown of children :

Babies / Nursery	-	16
Toddlers	-	36
Kindy	-	40

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. 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.

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

As part of the development, 1.8 metre high boundary fences will be installed along the northern and southern boundaries, as shown on the landscape plan attached in Appendix A.

The air condensing units will be located on the roof of the child care centre, as shown in Figure 02.

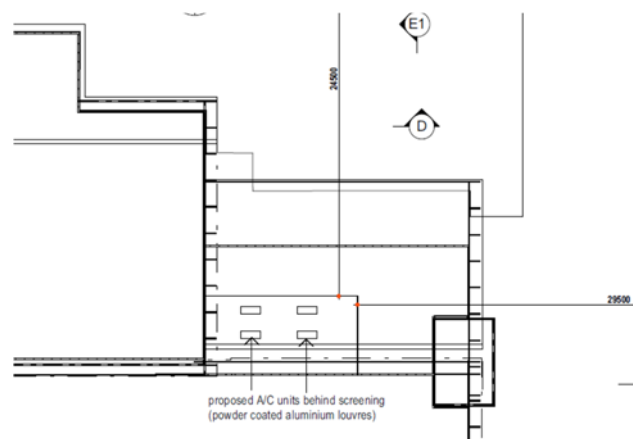


FIGURE 02 – LOCATION OF AIR CONDITIONING CONDENSING UNITS

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 as stated in the Department of Environment Regulation “Draft Guidance on Environmental Noise for Prescribed Premises”.

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)
Air conditioning condensing Unit	4 @ 72

6. ASSESSMENT

Given the number and breakdown of children, acoustic modelling of outdoor play noise was made, based on 60 children playing outside within the outdoor play areas at the one time, utilising 6 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 residence are also listed in Table 6.1.

From previous measurements, noise emissions from children playing is a broadband noise and does not contain any annoying characteristics. Noise emissions from the mechanical services would be tonal and a +5 dB(A) penalty would be applied, as shown in Table 6.1.

**TABLE 6.1 - ACOUSTIC MODELLING RESULTS FOR LA10 CRITERIA
 OUTDOOR PLAY AREAS AND MECHANICAL PLANT**

Neighbouring Premises	Calculated Noise Level (dB(A))	
	Children Playing	Air Conditioning
R1	43	29(34)
R2	37	22(27)
R3	45	28(33)
R4	45	19(24)
R5	44	19(24)
R6	43	18(23)

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

Tables 6.2 and 6.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

**TABLE 6.2 – 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	43	46	Complies
R2	37	45	Complies
R3	45	46	Complies
R4	45	46	Complies
R5	44	46	Complies
R6	43	46	Complies

**TABLE 6.3 – ASSESSMENT OF L_{A10} DAY PERIOD NOISE LEVEL EMISSIONS
 ALL AIR CONDITIONING (NIGHT PERIOD)**

Location	Assessable Noise Level, dB(A)	Applicable Assigned Noise Level (dB(A))	Exceedance to Assigned Noise Level
R1	34	36	Complies
R2	27	35	Complies
R3	33	36	Complies
R4	24	36	Complies
R5	24	36	Complies
R6	23	46	Complies

7. CONCLUSION

It is proposed that the proposed child care centre would only operate between 6:30am and 6pm, Monday to Friday (ie closed on Saturday, Sunday and Public Holidays) and would cater for up to 92 children, including 16 babies / nursery.

Noise received at the neighbouring residential premises from children playing in the outdoor play area would, with the inclusion of the 1.8 metre high fences to the northern and southern boundaries, as shown on the landscape plan attached in Appendix A, comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for the proposed operating hours.

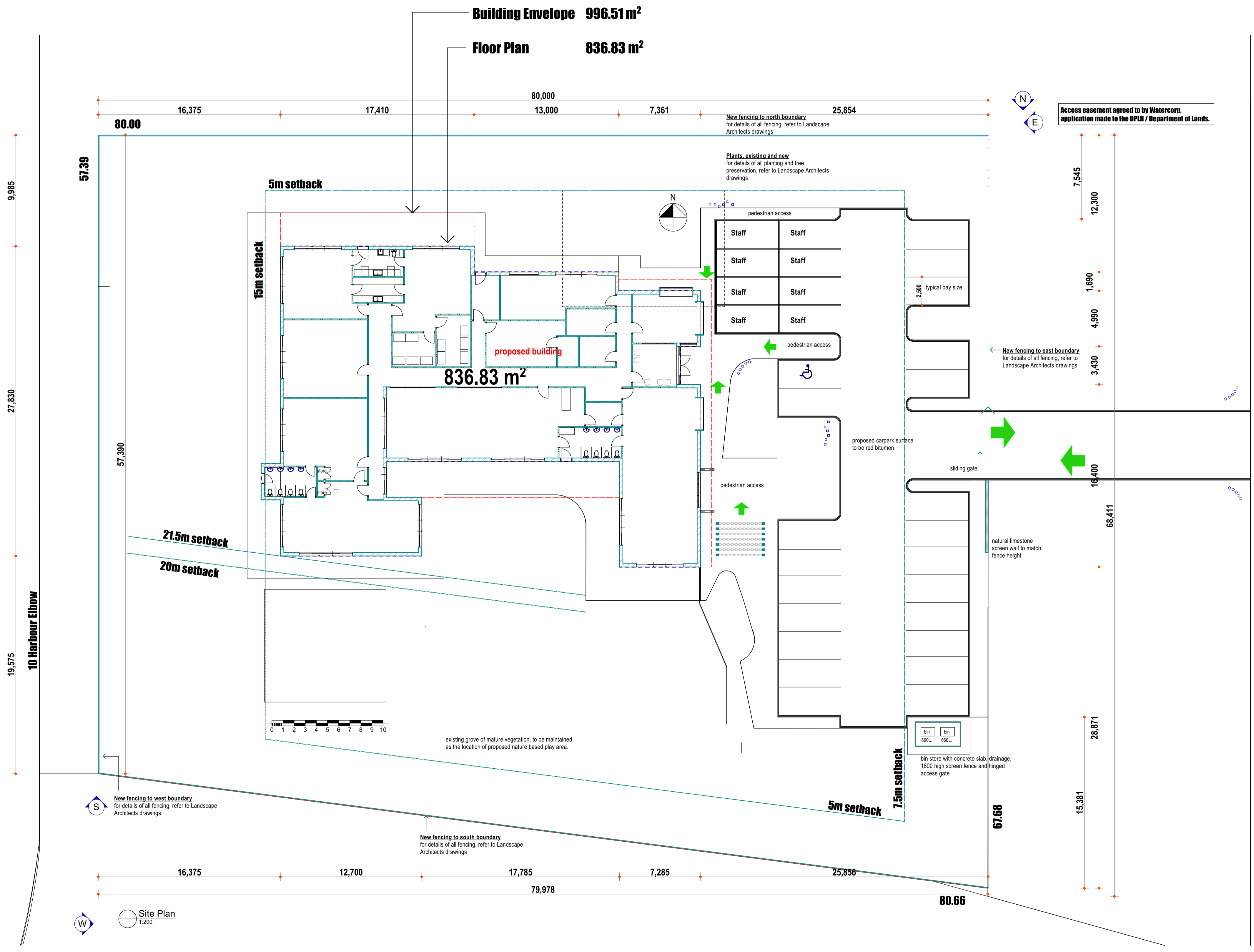
Note : Use of the outdoor play areas, to be restricted to the day period (ie after 7am).

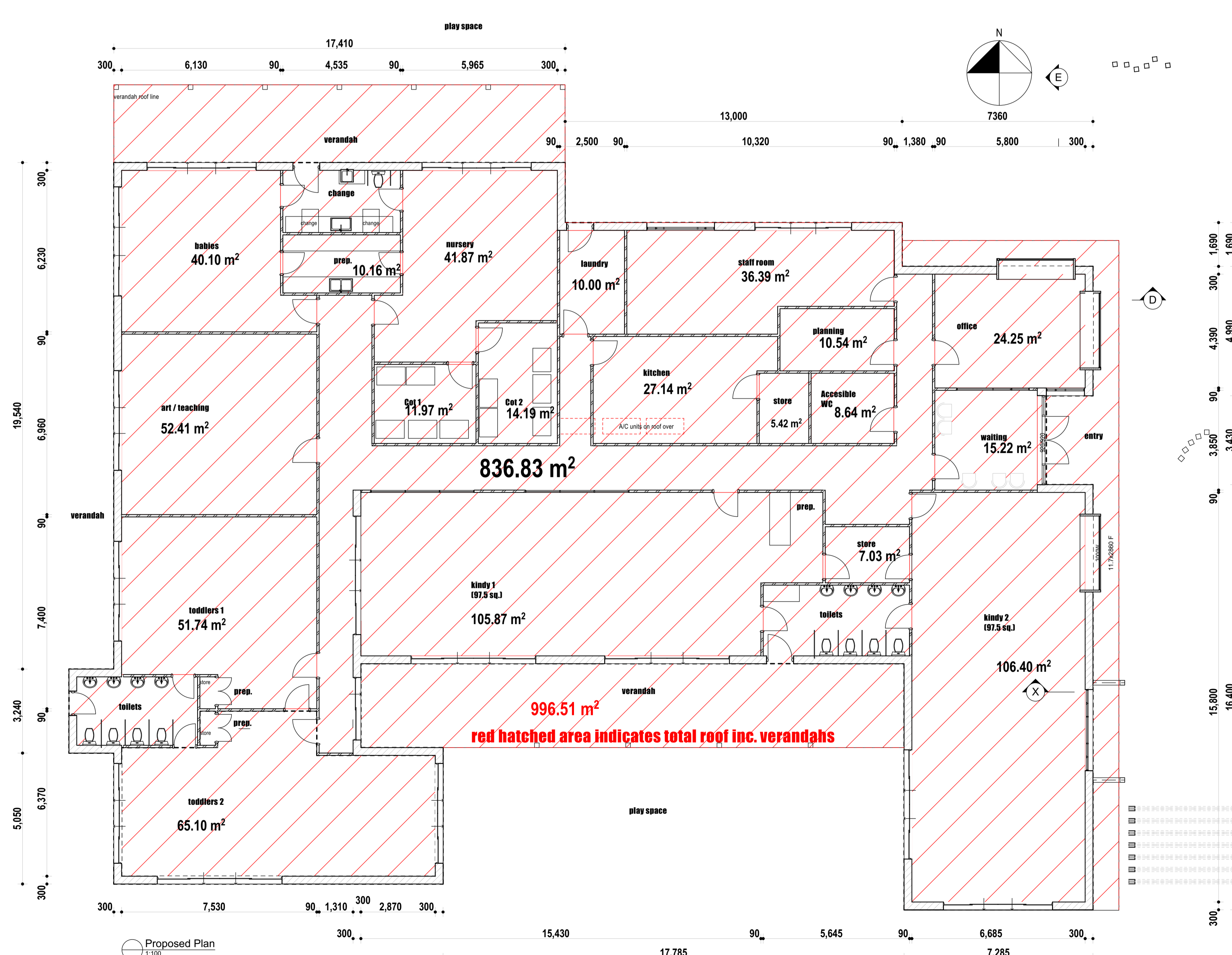
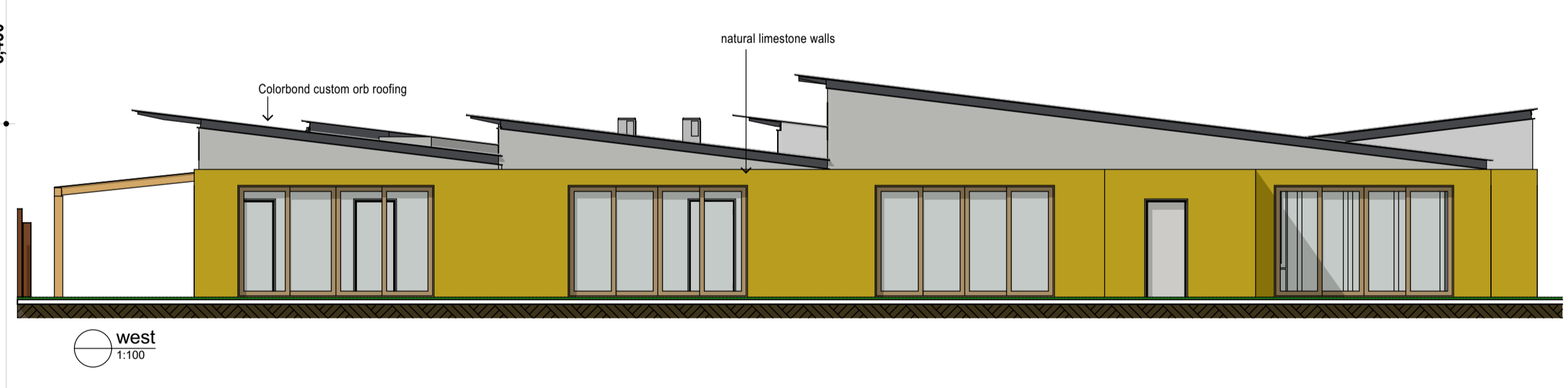
Noise from the mechanical services has also been assessed to comply with the relevant criteria.

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





john chisholm design BUILDING DESIGN & VISUALISATION 1 9397 2919 m, 0438 833 399 jcd@jchisholm.com www.jchisholm.com		NATIONAL ASSOCIATION OF BUILDING DESIGNERS BUILDING DESIGNERS ASSOCIATION OF WESTERN AUSTRALIA INC.		Project: Childcare Centre 10 Harbour Elb. Banksia Grove		Drawing: Proposed Floor Plan		Date: 19/03/2019		Drawn: JC	
E issued for planning 14/8/2018		K issued for information 19/3/2019		D issued for planning 16/5/2018		J issued for information 12/3/2019		Job No: 1702		Rev: A201 K	
F issued for planning 16/5/2018		H issued for information 4/3/2019		B issued for information 4/5/2018		G issued for information 13/2/2019		The builder must verify all dimensions on site before commencing any work or shop draws.			
A issued for information 20/4/2018		F issued for information 21/1/2019		REV. AMENDMENT DATE							



main entry



north elevation



east elevation



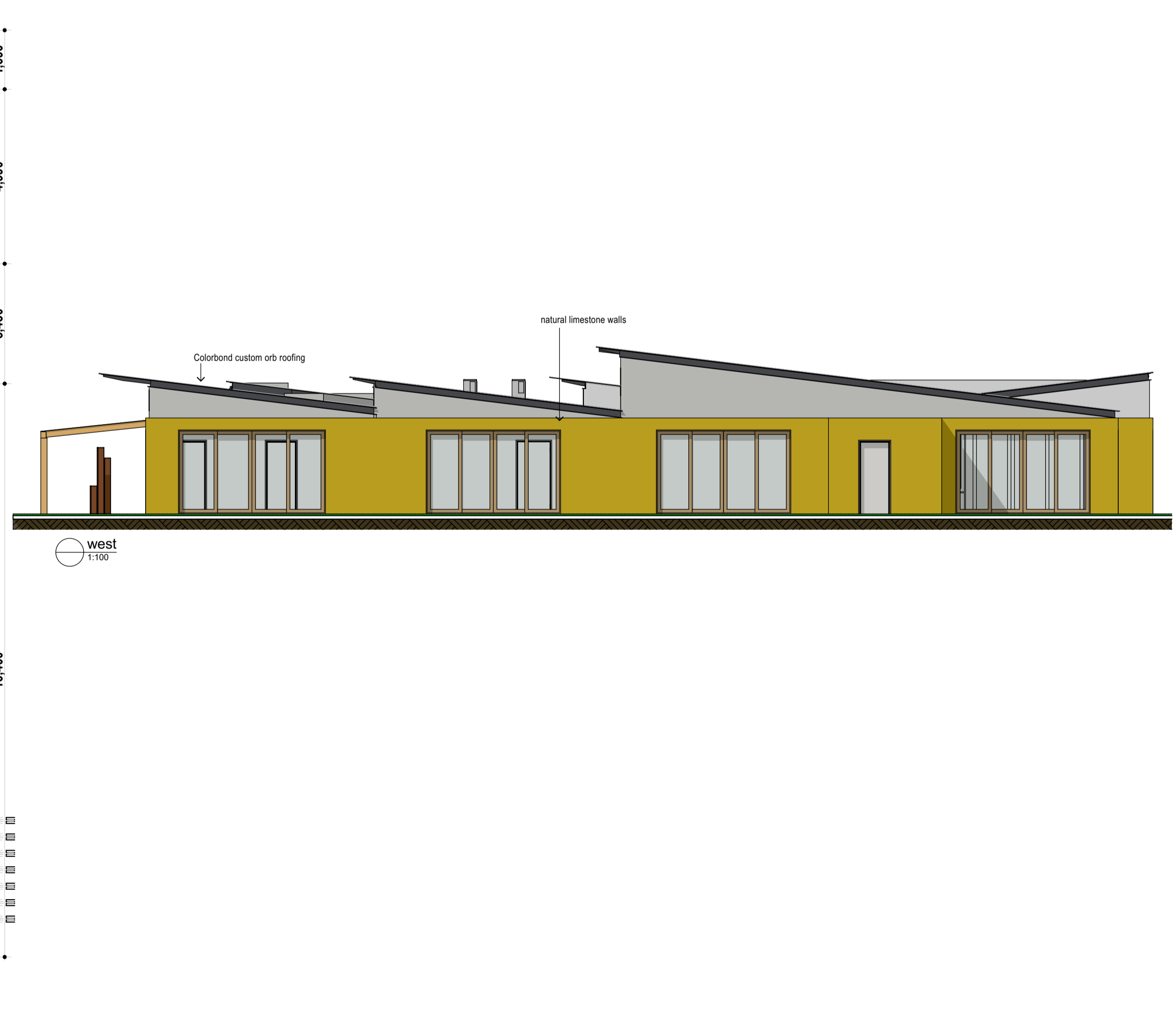
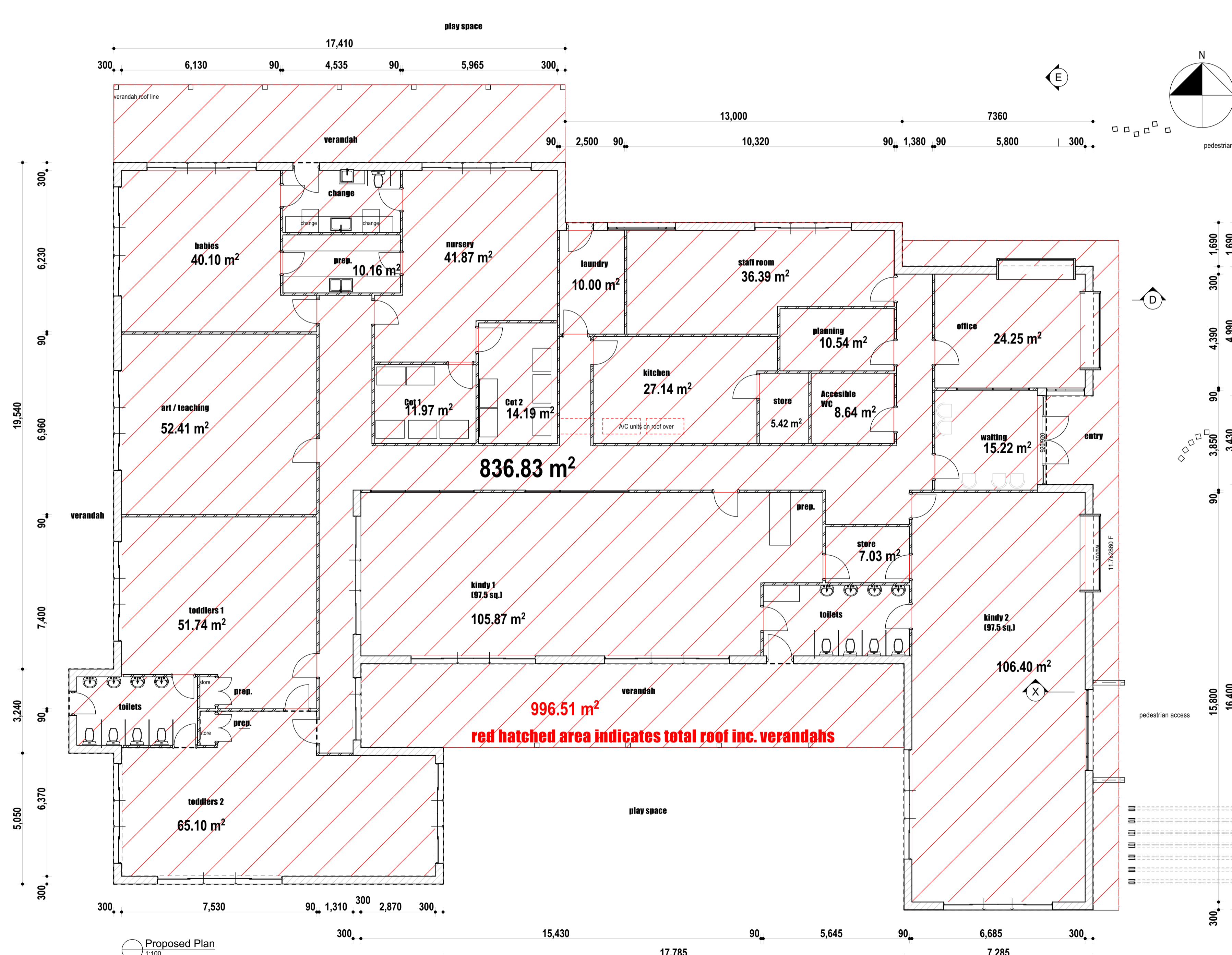
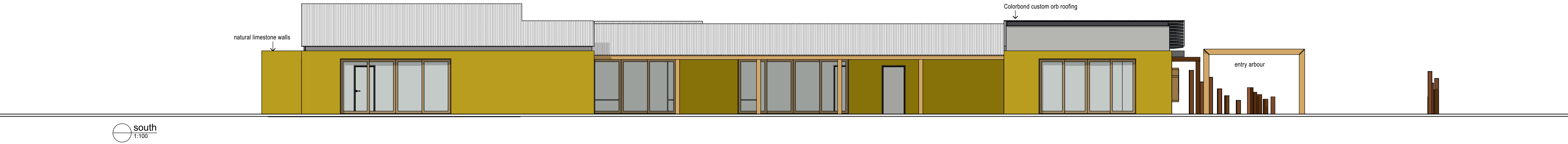
south east pedestrian entry



south elevation

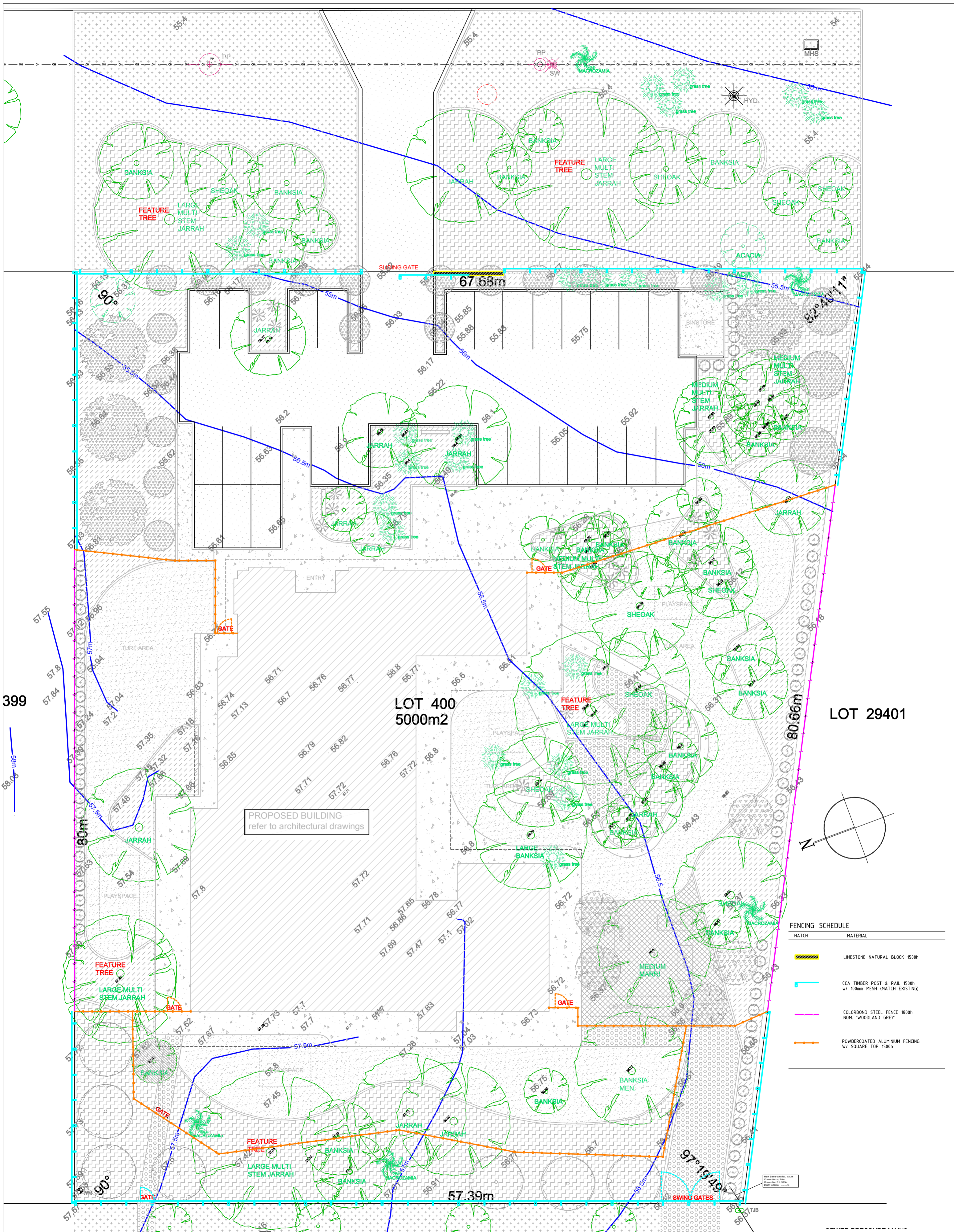


west elevation



Proposed Plan
1:100

john chisholm design BUILDING DESIGN & VISUALISATION 1 9397 2919 m, 0438 833 399 jcd@johnchisholm.com www.johnchisholm.com		NATIONAL ASSOCIATION OF BUILDING DESIGNERS BUILDING DESIGNERS ASSOCIATION OF WESTERN AUSTRALIA INC.		Project: Childcare Centre 10 Harbour Elb. Banksia Grove		Drawing: Proposed Floor Plan		Date: 12/03/2019		Drawn: JC	
E issued for planning 14/8/2018 D issued for planning 16/5/2018 C issued for planning 16/5/2018 B issued for information 4/5/2018 A issued for information 20/4/2018 REV AMENDMENT DATE		J issued for information 12/3/2019 H issued for information 4/3/2019 G issued for information 13/2/2019 F issued for information 21/1/2019		Job No: 1702		Date: 12/03/2019		Drawn: JC		Rev: A201 J	
The builder must verify all dimensions on site before commencing any work or shop draws.											



FENCING SCHEDULE	
HATCH	MATERIAL
	LIMESTONE NATURAL BLOCK 1500h
	CCA TIMBER POST & RAIL 1500h w/ 100mm MESH (MATCH EXISTING)
	COLORBOND STEEL FENCE 1800h NOM. "WOODLAND GREY"
	POWDERCOATED ALUMINIUM FENCING W/ SQUARE TOP 1500h

NOTES:

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DRAWN	N.CROWE	No	VARIATION	DRN	DATE	AUTH	PROJECT
SCALE	1:200 @ A2	A	ISSUED FOR REVIEW	CA	12.03.19	NC	ATLANTIS CHILDCARE CENTRE 10 HARBOUR ELBOW BANKSIA GROVE
DATE	12.03.19						TITLE
CLIENT	ATLANTIS CHILDCARE						LANDSCAPE - FENCING LAYOUT ISSUED FOR REVIEW
LANDSCAPE ARCHITECT							SIZE
							A2
							DRAWING NO.
							I C-04
							REV
							-