HERRING STORER ACOUSTICS

KERRY HILL ARCHITECTS

WOODSIDE CARE PRECINCT
EAST FREMANTLE

DEVELOPMENT APPLICATION
ACOUSTIC REPORT

APRIL 2022

OUR REFERENCE: 29426-1-20159

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FOR

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APPENDICIES

1.0 INTRODUCTION

Herring Storer Acoustics was commissioned by Kerry Hill Architects, to conduct a preliminary review of the proposed development of the Woodside Health and Aged Care Precinct, located at 18 Dalgety Street, East Fremantle.

The development consists of a four storey aged care facility wrapping around the existing heritage listed building, with a lower ground area for parking and pool/health facilities.

This report has been based on the Development Application drawings provided.

2.0 PROPOSED DEVELOPMENT

The proposed development site is located at 18 Dalgety Street, East Fremantle and spans, between Fortescue Street and Dalgety Street.

The development consists of 3 floors of aged care units wrapping around the refurbished/repurposed heritage building with a lower ground area.

The following summarises the development:

Lower Ground Level

Parking.
Health facilities including pool and gym.
Stores.
Staff areas.
Loading dock.

Ground Floor

Aged care accommodation.
Dining Areas.
Hall.
Offices.

First - Third Floors

Aged care accommodation.
Dining Areas.

Rooftop

Photovoltaic Cells.
Mechanical Plant.

In addition to the above, the repurposing / refurbishment of the heritage building consists of the following:

Ground Floor

Dining Areas.
Amenities.

First Floor

Aged care accommodation.

3.0 CRITERIA

3.1 BCA PROVISIONS

Construction of the residential sections of the development (aged care units) are required to meet Part F5 of the Building Code of Australia, with these areas being classified as "Class 9C".

The following is a summary of the requirements that need to be met for the Class 9C aged care facility within the development:

Walls

$R_w \geq 45$ dB	between rooms.
$R_w \geq 45$ dB	between rooms, kitchen, bathroom, sanitary compartment (not being an associated ensuite), laundry plant room or utilities room.

Walls separating rooms from a kitchen or laundry must contain a discontinuous construction.

Floors

$R_w \geq 45$ dB	between rooms.

Soil and Waste Pipes

A duct, soil, waste or water supply pipe that passes through more than one sole occupancy unit must be separated from the rooms of the sole occupancy unit with a construction that is not less than $R_w + C_{tr}$ of:

- 40 if the adjacent room is a habitable room (other than a kitchen); and
- 25 if the adjacent room is a kitchen or non-habitable room.

3.2 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels at any noise sensitive premises from other premises. The allowable or assigned noise levels for noise sensitive premises are determined by the calculation of an influencing factor, which is added to the baseline criteria set out in Table 1 of the Regulations. The baseline assigned noise levels are listed in Table 3.1. For commercial premises, the allowable or assigned noise levels are the same for all hours of the day. Table 3.1 also lists the assigned noise levels for commercial premises.

TABLE 3.1 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises within 15 metres of a dwelling	0700 - 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	35 + IF	45 + IF	55 + IF

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at other premises, 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 15dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3dB $L_{A\ Fast}$ 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 $L_{A\ Slow}$ levels.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at other premises.

TABLE 3.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

From a review of the development, the influencing factor for this development would be 2 dB, based on the following:

Major Roads within outer circle;	
Canning Highway	+ 2 dB
Total IF	**+ 2 dB**

Hence the influencing factor would be + 2 dB and 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 within 15 metres of a dwelling	0700 - 1900 hours Monday to Saturday	47	57	67
	0900 - 1900 hours Sunday and Public Holidays	42	52	67
	1900 - 2200 hours all days	42	52	57
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	37	47	57

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.

We note that noise emissions from the premises need to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*. This primarily consists of mechanical services associated with the development.

3.3 NOISE INGRESS

Inbound Noise Levels

Traffic noise impact for the proposed development will need to be assessed in accordance with WAPC State Planning Policy 5.4, attributable to noise from

The aim of the planning policy is to design the residential building façade to achieve the following internal sound levels:

- L_{eq} 35 dB(A) in sleeping areas (bedrooms); and
- L_{eq} 40 dB(A) in living/work areas and other habitable rooms.

4.0 BCA REQUIREMENTS

The proposed development will be constructed to comply with the requirements of Part F5 of the NCC.

5.0 NOISE INGRESS

5.1 NOISE SOURCE IDENTIFICATION

Noise levels of the area are predominantly impacted by traffic noise. The barrier affect that the houses between the development and Canning Highway is significant, hence, the amelioration required for the development will be limited to the glazing for the upper floors, and those facing the north (direction of Canning Highway).

The measures required are considered to be minimal, with an assessment in accordance with State Planning 5.4 appropriate to be a condition of development approval.

6.0 NOISE FROM DEVELOPMENT

The main source of noise from the proposed development will be from mechanical services consisting of air-conditioning plant and perhaps carpark ventilation fans. Noise received at neighbouring premises, and premises within the development, from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

6.1 MECHANICAL SERVICES

The main source of noise from the proposed development will be from mechanical services consisting of car-park ventilation fans and air-conditioning plant. Noise received at residence (neighbours and residence within the development) from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

As the mechanical services could operate during the night, noise emissions from the development needs to comply with the assigned L_{A10} night period noise level of 37 dB(A) at residential premises. Potentially, noise emissions from mechanical services could be tonal, in which case an +5 dB(A) penalty for a tonal component could be applied to the resultant noise levels. Therefore, the design level at the neighbouring residential premises would be 32 L_{A10} dB.

6.1.1 Air Conditioning

The air conditioning for the aged care units are proposed to be located in plantrooms on the roof of the building.

Once the design of the system is finalised, an acoustic assessment will be carried out of noise emissions from the mechanical plant and any noise amelioration required will be incorporated into the design to ensure compliance with the *Environmental Protection (Noise) Regulations 1997*. However, we believe that compliance would be easily achieved and any noise mitigation would be minimal, with the proposed location of mechanical plant.

The cooling tower on the roof of the northern wing of the proposed new section will need to be considered in relation to applicable noise control measures. This could take the form of barriers between the control tower and the residential premises to the north and/or speed control during the night period (which would not be considered onerous given the lower heat loads at this time).

6.1.2 Car Park Exhaust Fan

Noise emissions from carpark exhaust fans, will also need to comply with the Regulatory requirements. From previous projects, we believe that with careful fan selection and the incorporation of either 1D or 2D unpadded silencers, compliance with the *Environmental Protection (Noise) Regulations 1997* is normally achieved.

An assessment of noise emissions will be carried out once equipment has been selected and submitted for approval.

7.0 WELLNESS SPACE

The location of the wellness space is below accommodation.

The usage of the space will need to be confirmed during the design phase of the project, however, consideration will be needed to prevent any possible structurally re-radiated noise from such sources as:

- Gym use (dropping of weights, pin loaded machine “thumps” etc).
- Pool equipment.

The structural isolation of pool pump equipment can alleviate pool noise radiating through the building. The use of rubber isolation matting and/or lifting platforms and the like will need to be considered in any gym/exercise space to ensure there is no disturbance throughout the building. The isolation requirements, especially of the gym area, is very much dependent on the intended usage.

8.0 HERITAGE BUILDING

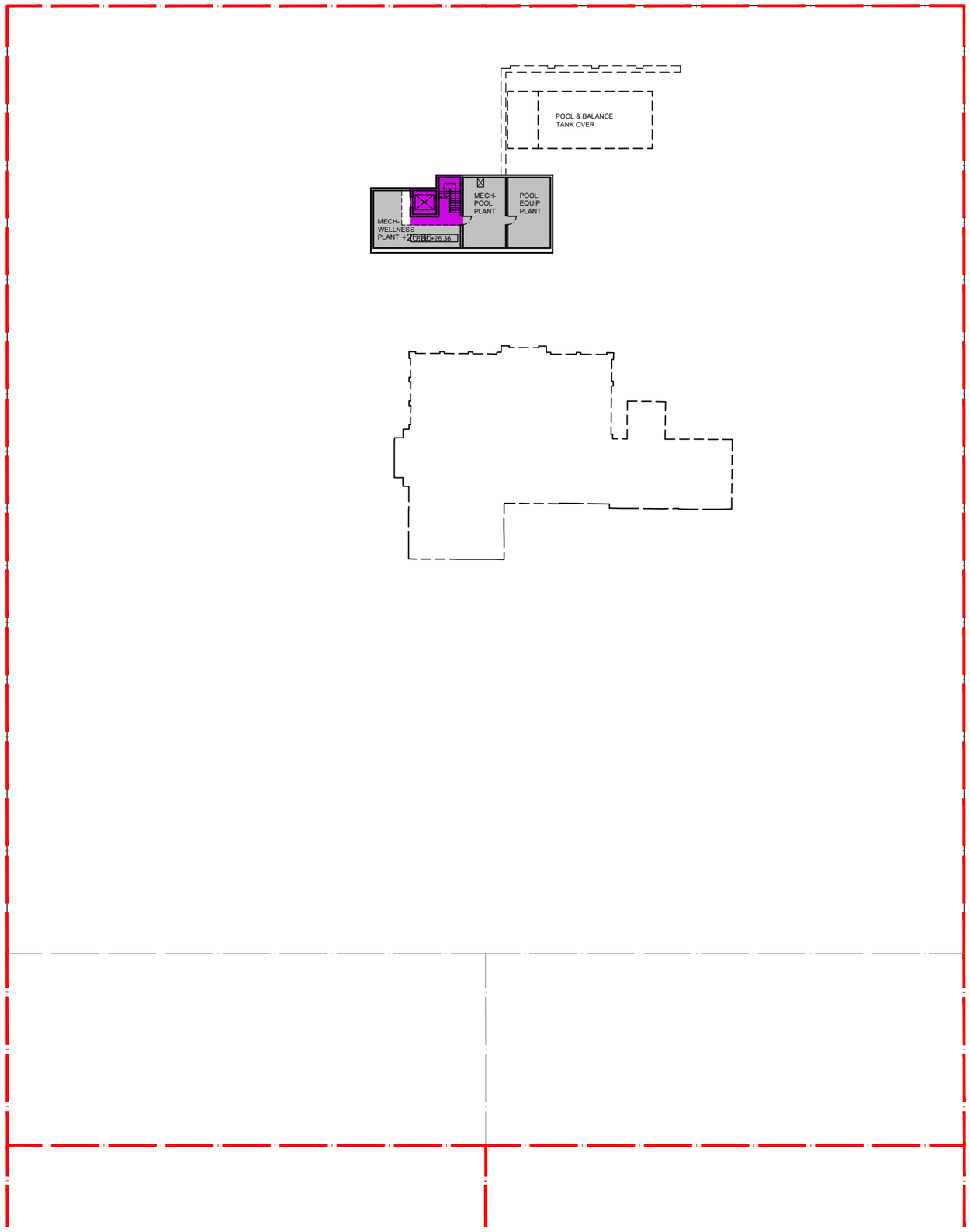
Given the location of the heritage building in relation to the new building areas, during construction there may be a need to consider vibration effects upon the structure. This could take the form of a vibration monitor permanently in place during construction with alert levels set commensurate to the state of the building.

The accommodation on the second floor of the heritage building will require additions to the floor to ensure the NCC requirements are met. Assuming that the floor is of timber construction, this is likely to be either a raised flooring system on the second floor (likely constructed of fibre cement), or similarly below.

The dividing wall construction (assuming that no existing walls within the second floor are to remain) is likely to consist of lightweight walling systems. Should there be existing wall to consider, testing will need to be undertaken to ascertain the existing acoustic properties.

APPENDIX A

DEVELOPMENT APPLICATION PLANS



	FUNCTION	RESIDENTS	ROOM
	SINGLE ROOMS		
	SINGLE ACC. ROOMS		
	COMPANION ROOMS		
	SUITES		
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		
	COMMUNAL SITTING ROOM		
	WELLNESS CENTRE		
	ENGAGE		
	LIFT CORE		1
	SERVICE		
	PLANT		
	CAR PARK (BAYS)		
	BM TOTAL	-	-

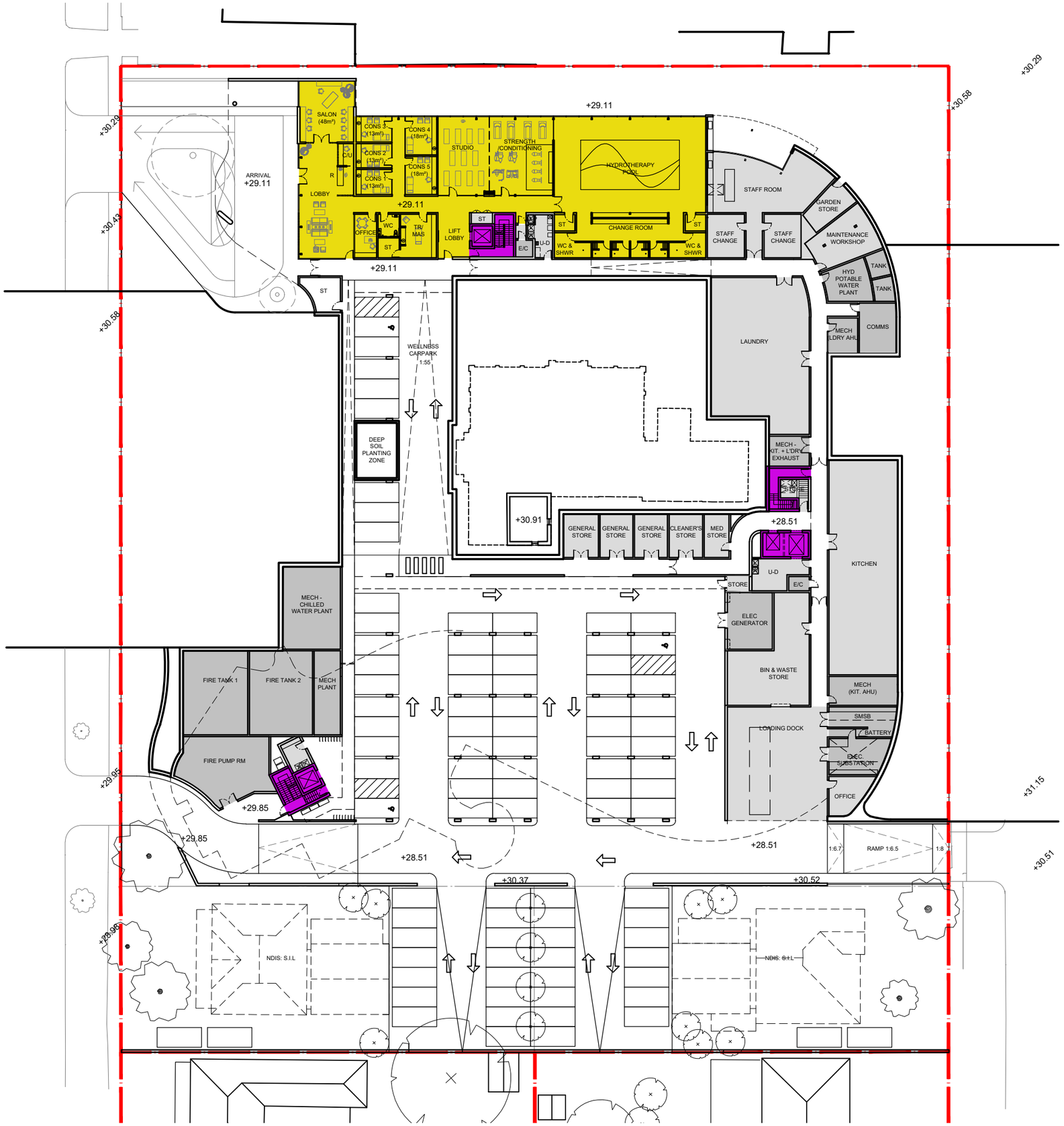
BASEMENT PLAN

1:500 @ A3

WOODSIDE CARE PRECINCT

REV SD-J

DATE 22.04.2022



	FUNCTION		No.
	SINGLE ROOMS		
	SINGLE ACC. ROOMS		
	COMPANION ROOMS		
	SUITES		
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		
	COMMUNAL SITTING ROOM		
	WELLNESS CENTRE		
	ENGAGE		
	LIFT / STAIR CORE		
	SERVICE		
	PLANT		
	CAR BAYS - STANDARD		84
	CAR BAYS - ACCESSIBLE		3
	LG TOTAL		87
	CAR BAYS - STANDARD GF		3
	TOTAL CAR BAYS		90

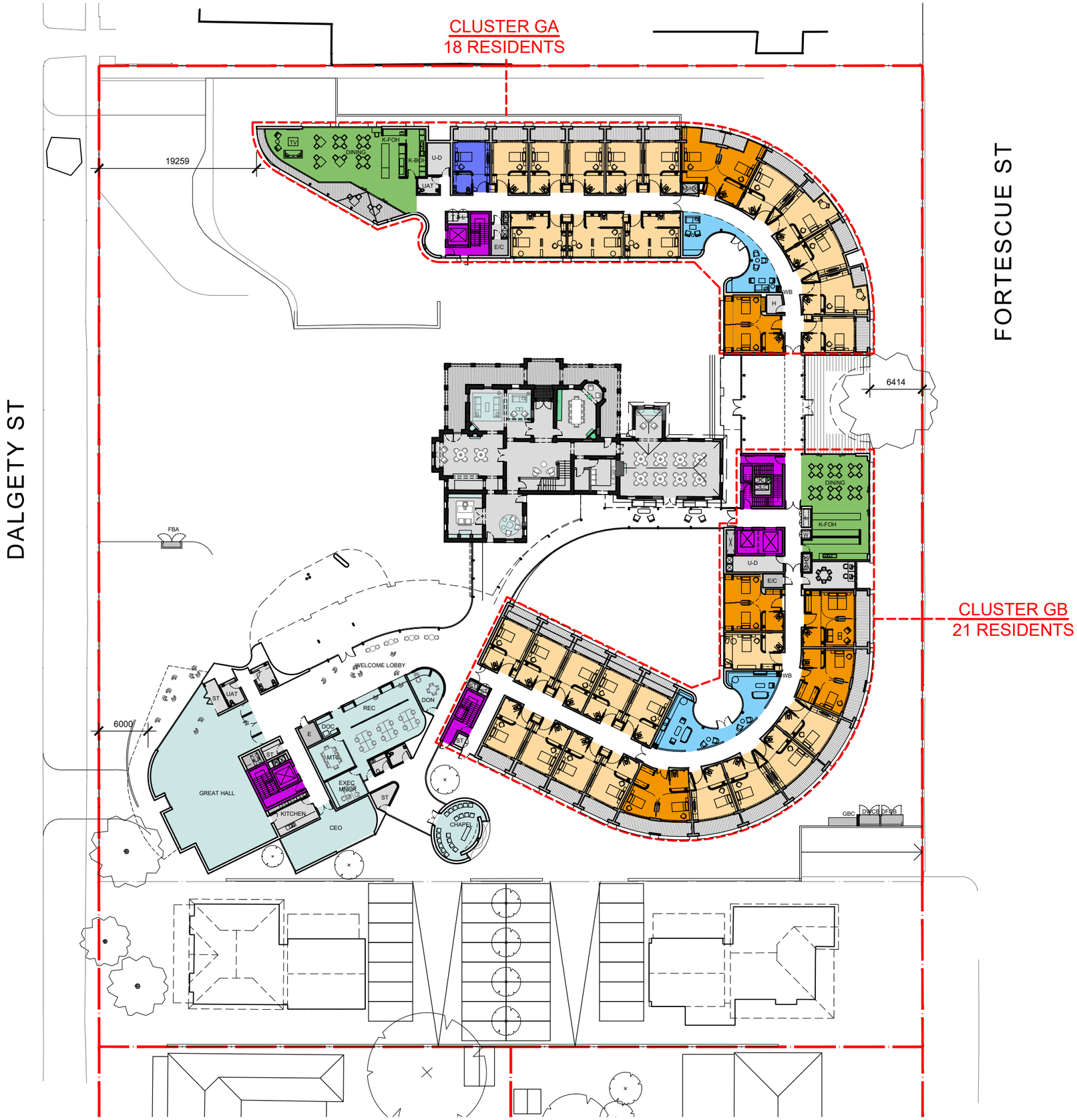
LOWER GROUND PLAN

1:500 @ A3

REV SD-J

DATE 22.04.2022

WOODSIDE CARE PRECINCT



	FUNCTION	RESIDENTS	ROOM
	SINGLE ROOMS	27	27
	SINGLE ACC. ROOMS	1	1
	COMPANION ROOMS	12	6
	SUITES	0	0
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		3
	COMMUNAL SITTING ROOM		2
	WELLNESS CENTRE		
	ENGAGE		
	LIFT / STAIR CORE		4
	SERVICE		
	PLANT		
	CAR PARK (BAYS)		3
	GF TOTAL	40	34

GROUND FLOOR PLAN 1:500 @ A3

REV SD-J DATE 22.04.2022

WOODSIDE CARE PRECINCT

	FUNCTION	RESIDENTS	ROOM
	SINGLE ROOMS	30	30
	SINGLE ACC. ROOMS	4	4
	COMPANION ROOMS	16	8
	SUITES	4	4
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		3
	COMMUNAL SITTING ROOM		5
	WELLNESS CENTRE		
	ENGAGE		
	LIFT / STAIR CORE		4
	SERVICE		
	PLANT		
	CAR PARK (BAYS)		
	FF TOTAL	54	46

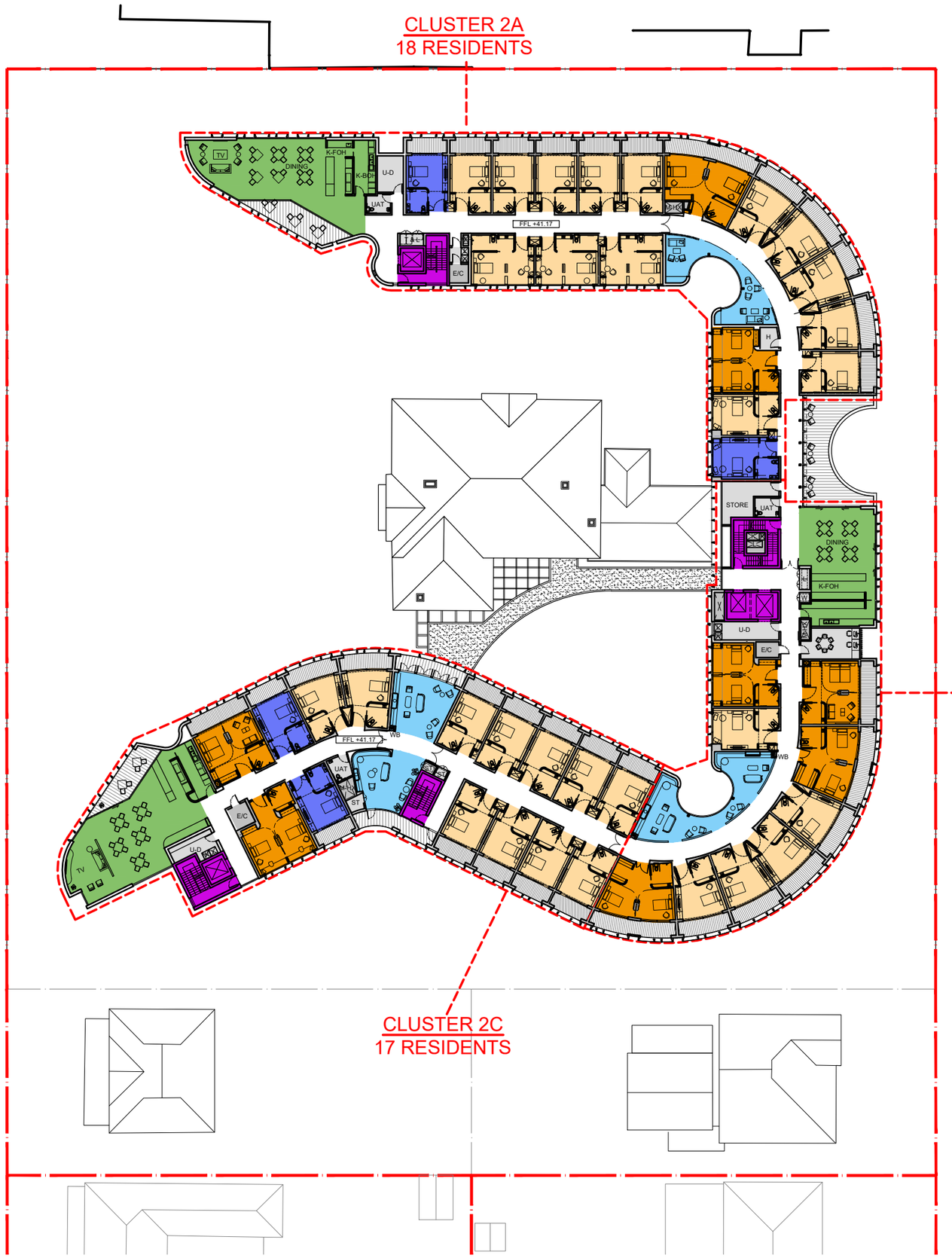
FIRST FLOOR PLAN

1:500 @ A3

WOODSIDE CARE PRECINCT

REV SD-J

DATE 22.04.2022



	FUNCTION	RESIDENTS	ROOM
	SINGLE ROOMS	30	30
	SINGLE ACC. ROOMS	4	4
	COMPANION ROOMS	16	8
	SUITES	0	0
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		3
	COMMUNAL SITTING ROOM		3
	WELLNESS CENTRE		
	ENGAGE		
	LIFT CORE		3
	SERVICE		
	PLANT		
	CAR PARK (BAYS)		
	SF TOTAL	50	42

SECOND FLOOR PLAN

1:500 @ A3

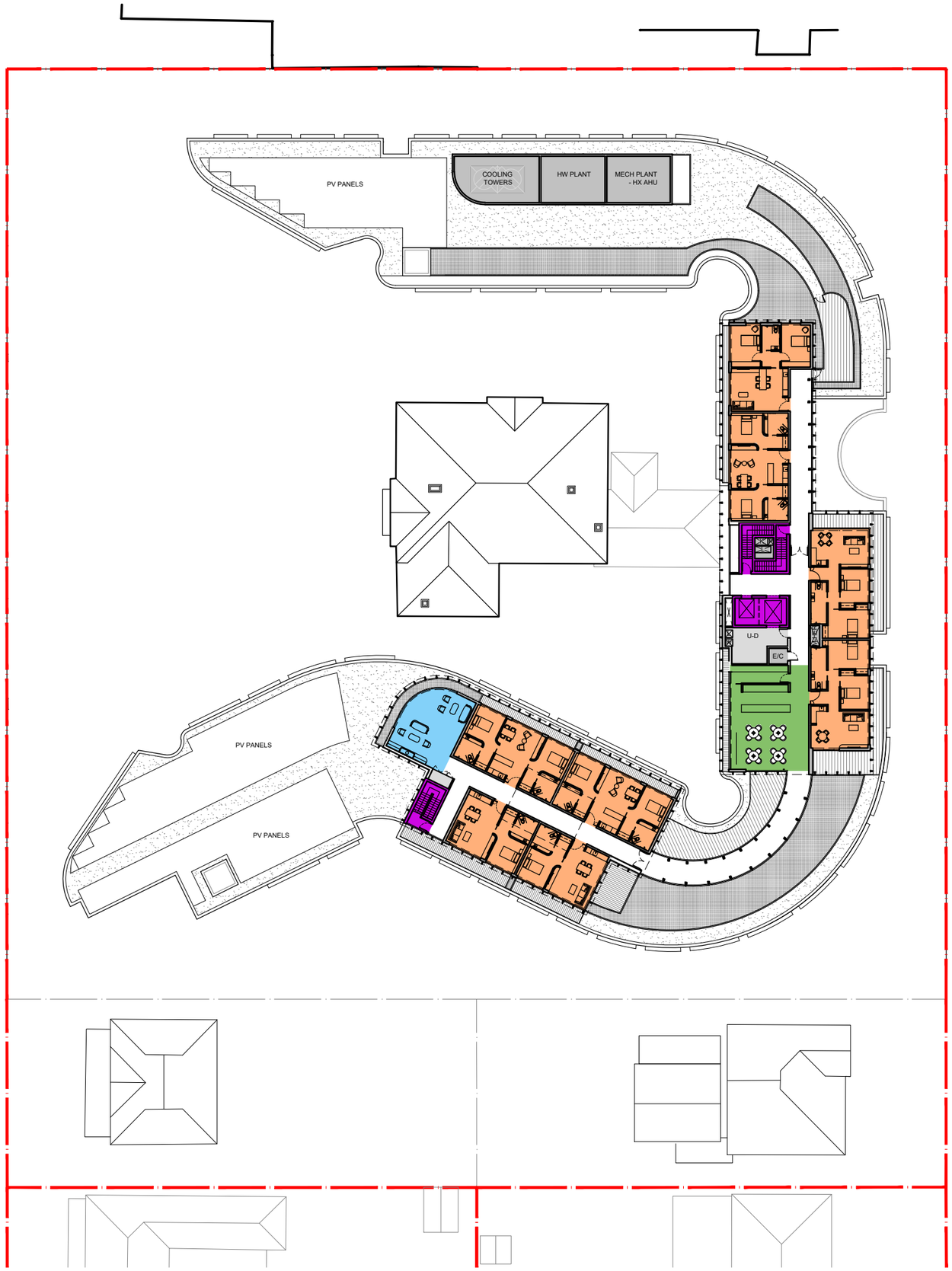
WOODSIDE CARE PRECINCT

REV SD-J

DATE 22.04.2022

DALGETY ST

FORTESCUE ST



	FUNCTION	RESIDENTS	ROOM
	SINGLE ROOMS	0	0
	SINGLE ACC. ROOMS	0	0
	COMPANION ROOMS	0	0
	SUITES	14	8
	BALCONY		
	COMMUNAL TERRACE		
	COMMUNAL LKDT		1
	COMMUNAL SITTING ROOM		1
	WELLNESS CENTRE		
	ENGAGE		
	LIFT / STAIR CORE		2
	SERVICE		
	PLANT		
	CAR PARK (BAYS)		
	TF TOTAL	14	8
	GRAND TOTAL	158	130

THIRD FLOOR PLAN

1:500 @ A3

WOODSIDE CARE PRECINCT

REV SD-J

DATE 22.04.2022