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COMO BAPTIST CHURCH, COMO

SPP 5.4 NOISE MANAGEMENT PLAN

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**SPP 5.4 NOISE MANAGEMENT PLAN
COMO BAPTIST CHURCH, COMO**

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FOR

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by DEM to carry out an acoustic study with regards to traffic related noise for the proposed Como Baptist Church located on 109, 111 & 113 Robert Street as well as 469 & 371 Canning Highway, Como.

The purpose of the study was to:

- Assess the noise that would be received within the development area from vehicles travelling on Canning Highway for future traffic volumes.
- Compare the results with accepted criteria and if exceedances exist, develop the framework for the management of noise.

It is noted that with regard to State Planning Policy 5.4, that this forms a specialist acoustic assessment, taking into account the provided building design and as such, is more specific assessment than a "Quiet House Design Package" typically recommended with State Planning Policy.

Design plans are attached in Appendix A.

2. ACOUSTIC CRITERIA

2.1 NOISE

The Western Australian Planning Commission (WAPC) released on 6th September 2019 State Planning Policy 5.4 "Road and Rail Noise". The requirements of State Planning Policy 5.4 are outlined below.

POLICY APPLICATION (Section 4)

When and where it applies (Section 4.1)

SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed:

- a) noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in **Table 1**;*
- b) New or major upgrades of roads as specified in **Table 1** and maps (**Schedule 1, 2 and 3**); or*
- c) New railways or major upgrades of railways as specified in maps (**Schedule 1, 2 and 3**); or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise.*

Policy trigger distances (Section 4.1.2)

Table 1 identifies the State's transport corridors and the trigger distances to which the policy applies.

*The designation of land within the trigger distances outlined in **Table 1** should not be interpreted to imply that land is affected by noise and/or that areas outside the trigger distances are un-affected by noise.*

Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/mitigation required. An initial screening assessment (**guidelines: Table 2: noise exposure forecast**) will determine if the lot is affected and to what extent.”

TABLE 1: TRANSPORT CORRIDOR CLASSIFICATION AND TRIGGER DISTANCES

Transport corridor classification	Trigger distance	Distance measured from
Roads		
Strategic freight and major traffic routes Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume	300 metres	Road carriageway edge
Other significant freight/traffic routes These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meet the criteria of either >=23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes)	200 metres	Road carriageway edge
Passenger railways		
	100 metres	Centreline of the closest track
Freight railways		
	200 metres	Centreline of the closest track

Proponents are advised to consult with the decision making authority as site specific conditions (significant differences in ground levels, extreme noise levels) may influence the noise mitigation measures required, that may extend beyond the trigger distance.

POLICY MEASURES (Section 6)

The policy applies a performance-based approach to the management and mitigation of transport noise. The policy measures and resultant noise mitigation will be influenced by the function of the transport corridor and the type and intensity of the land-use proposed. Where there is risk of future land-use conflict in close proximity to strategic freight routes, a precautionary approach should be applied. Planning should also consider other broader planning policies. This is to ensure a balanced approach takes into consideration reasonable and practical considerations.

Noise Targets (Section 6.1)

Table 2 sets out noise targets that are to be achieved by proposals under which the policy applies. Where exceeded, an assessment is required to determine the likely level of transport noise and management/mitigation required.

In the application of the noise targets the objective is to achieve:

- indoor noise levels as specified in **Table 2** in noise sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and
- a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.

It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

TABLE 2: NOISE TARGETS

Proposals	New/Upgrade	Noise Targets		
		Outdoor		Indoor
		Day ($L_{Aeq}(\text{Day})$ dB) (6 am-10 pm)	Night ($L_{Aeq}(\text{Night})$ dB) (10 pm-6 am)	(L_{Aeq} dB)
Noise-sensitive land-use and/or development	New noise sensitive land use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	L_{Aeq} (Day) 40(Living and work areas) L_{Aeq} (Night) 35 (bedrooms)
Roads	New	55	50	N/A
	Upgrade	60	55	N/A
Railways	New	55	50	N/A
	Upgrade	60	55	N/A

Notes:

- The noise target is to be measured at one metre from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.
- For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.
- The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.
- Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.

Noise Exposure Forecast (Section 6.2)

When it is determined that SPP 5.4 applies to a planning proposal as outlined in Section 4, proponents and/or decision makers are required to undertake a preliminary assessment using **Table 2**: noise exposure forecast in the guidelines. This will provide an estimate of the potential noise impacts on noise-sensitive land-use and/or development within the trigger distance of a specified transport corridor. The outcomes of the initial assessment will determine whether:

- no further measures is required;
- noise-sensitive land-use and/or development is acceptable subject to deemed-to-comply mitigation measures; or
- noise-sensitive land-use and/or development is not recommended. Any noise-sensitive land-use and/or development is subject to mitigation measures outlined in a noise management plan.”

3. MEASUREMENTS AND OBSERVATIONS

To determine the existing acoustic environment at the proposed development, two noise data loggers was located at the development site, with data collected from 25 September to 31 September 2020.

The automatic noise data logger records sound pressure levels in accordance with Australian Standard 2702-1984: *Acoustics - Method For Measurement of Road Traffic Noise*. The logger used records statistical noise level data, of which the L_{A1} , L_{A10} , L_{Aeq} and L_{A90} levels are reported. These are defined below:

- L_{A1} The noise level exceeded for 1% of the time (in this instance, the noise level exceeded for 36 seconds in each 1-hour period).
- L_{A10} The noise level exceeded for 10% of the time (in this instance, the noise level exceeded for 6 minutes in each 1-hour period).
- L_{Aeq} The energy equivalent noise level for the 1-hour period. A single number value that expresses the time-varying sound level for the 1-hour period as though it were a constant sound level with the same total sound energy as the time-varying level.
- L_{A90} The noise level exceeded for 90% of the time (in this instance, the noise level exceeded for 54 minutes in each 1-hour period).

The loggers were calibrated before and after the measurement period and have been subject to a laboratory calibration within the last 24 months.

The results of the noise logging are summarised in Table 3.1 and 3.2. It is noted that the logger behind the existing buildings was put in place to ensure that the modelling accurately reflected the barrier effect of the surrounding premises (for Kwinana Freeway noise levels).

TABLE 3.1 - SUMMARY OF MEASURED NOISE LEVELS (CANNING HIGHWAY)

Parameter	Measured Level dB(A)*	Difference between $L_{10(18hour)}$ and $L_{Aeq(parameter)}$ dB(A)
L_{A10} (18 hour)	66.3	N/A
$L_{Aeq, day}$ (6am to 10pm)	63.4	= L_{A10} (18 hour) - 2.9
$L_{Aeq, night}$ (10pm to 6am)	56.8	= L_{A10} (18 hour) - 9.5

TABLE 3.2 - SUMMARY OF MEASURED NOISE LEVELS (BEHIND EXISTING HOUSES)

Parameter	Measured Level dB(A)*	Difference between $L_{10(18hour)}$ and $L_{Aeq(parameter)}$ dB(A)
L_{A10} (18 hour)	53.2	N/A
$L_{Aeq, day}$ (6am to 10pm)	53.8	= L_{A10} (18 hour) + 0.8
$L_{Aeq, night}$ (10pm to 6am)	48.7	= L_{A10} (18 hour) - 4.5

* It is normal practice to quote decibels to the nearest whole number. Fractions are retained here to minimise any cumulative rounding error.

4. MODELLING

To determine the noise levels from traffic on Canning Highway, acoustic modelling was carried out using SoundPlan, using the Calculation of Road Traffic Noise (CoRTN)¹ algorithms.

The input data for the model included:

- Plans supplied by client (Shown in Appendix A);
- Traffic data as per Table 4.1 (And Sourced in Appendix C);
- Adjustments as listed in Table 4.2.

TABLE 4.1 - NOISE MODELLING INPUT DATA

Parameter	Canning Highway (Current) 2018	Canning Highway (Future) 2040
Traffic Volumes	42260 vpd	65430 vpd
Percentage traffic 0600 – 2400 hours (Assumed)	94%	94%
Heavy Vehicles (%) (Assumed)	6.3%	6.3%
Speed (km/hr)	60km/hr	60km/hr

TABLE 4.2 – ADJUSTMENTS FOR NOISE MODELLING

Description	Value
Façade Reflection Adjustment	+2.5 dB
Conversion from L _{A10 (18 hour)} to L _{Aeq (16 hour)} (Day)	-2.9 dB

5. TRAFFIC NOISE ASSESSMENT

Using the data contained in Tables 4.1 and 4.2 modelling was carried out under existing conditions for calibration. The SoundPlan model for the site has been set up for the 2040 scenario as defined in Table 4.1. The following assumptions have been made:

- 18 hour traffic count will be 94% of daily figures;
- The same diurnal relationship will exist in the future between the L_{A10 (18 hour)} and the L_{Aeq} parameters; and
- 2.5 dB(A) has been added to the results for façade reflection.

The results of the noise modelling as well as required R_w ratings for windows are shown in Appendix B, with example windows for various R_w ratings showing Table 5.1

¹ Calculation of Road Traffic Noise UK Department of Transport 1987

TABLE 5.1 MINIMUM ACOUSTIC RATING OF SELECTED EXTERNAL BUILDING ELEMENTS

Glazing Type	Airborne weighted sound reduction rating with traffic correction R_w+C_{tr} , dB	Building element Type Airborne weighted sound
Sliding or double hung opening	23	<ul style="list-style-type: none"> • 4mm monolithic glass
	26	<ul style="list-style-type: none"> • Single pane glazing to R_w 33dB • 6mm monolithic or laminated glass • 6mm toughened safety glass • '6-12-6' double insulated glass unit (IGU)
	29	<ul style="list-style-type: none"> • Single pane glazing to R_w 36dB • 10mm monolithic (aka float) glass • 10mm laminated or toughened safety glass • 6mm-12mm-10mm double insulating
Fixed sash, awning or casement type opening	26	<ul style="list-style-type: none"> • 4mm monolithic glass
	31	<ul style="list-style-type: none"> • Single pane glazing to R_w 33dB • 6mm monolithic or laminated glass • 6mm toughened safety glass • '6-12-6' double insulated glass unit (IGU)
	34	<ul style="list-style-type: none"> • Single pane glazing to R_w 36dB • 10mm monolithic (a.k.a. float) glass • 10mm laminated or toughened safety glass • 6mm-12mm-10mm double insulated glass unit (IGU)
	36	6.5mm VLam Hush
	38	8.5mm VLam Hush
	39	10.5mm VLam Hush
	40	12.5mm VLam Hush
Fully glazed sliding door	24	<ul style="list-style-type: none"> • 6mm monolithic or laminated • 5 or 6mm toughened safety glass
	27	<ul style="list-style-type: none"> • 10mm monolithic or laminated • 10mm toughened safety glass
	36	6.5mm VLam Hush
	38	8.5mm VLam Hush
	39	10.5mm VLam Hush
	40	12.5mm VLam Hush

6. CONCLUSION

In accordance with the WAPC Planning Policy 5.4, an assessment of the noise that would be received within the Como Baptist Church development, from vehicles travelling on Canning Highway has been undertaken.

In accordance with the Policy, the following would be the acoustic criteria applicable to this project:

External

Day	55 dB(A) L_{Aeq}
Night	50 dB(A) L_{Aeq}

Internal

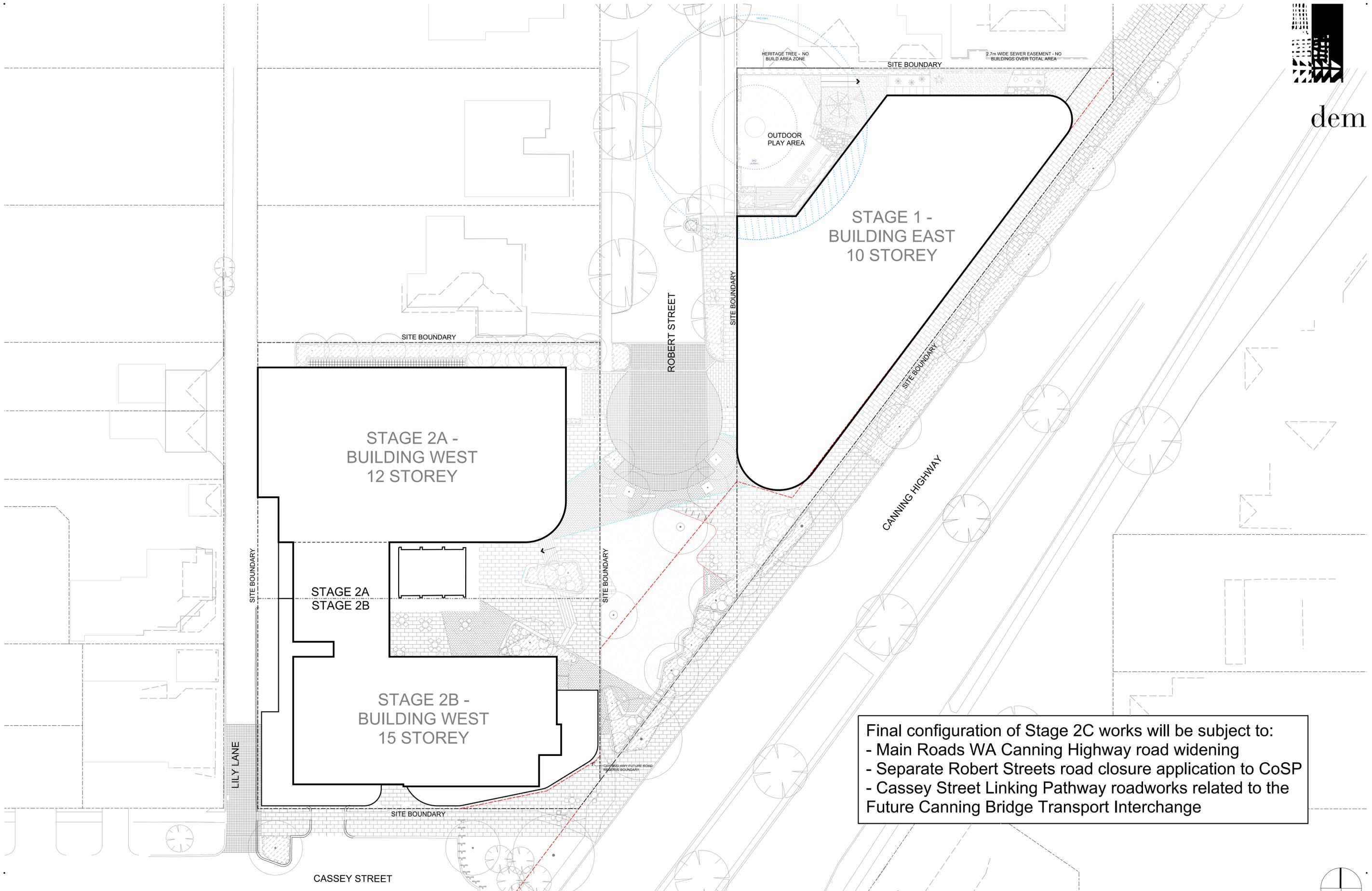
Sleeping Areas	35 dB(A) $L_{Aeq(night)}$
Living Areas	40 dB(A) $L_{Aeq(day)}$

The results of the acoustic assessment indicate that noise received at the development from future traffic, exceed external noise level criteria. Therefore, noise amelioration in the form of "Quiet House" design upgrades as listed in Appendix B are required.

Additionally, notifications on the title for the development would be required for the development.

APPENDIX A

Plans



Final configuration of Stage 2C works will be subject to:

- Main Roads WA Canning Highway road widening
- Separate Robert Streets road closure application to CoSP
- Cassey Street Linking Pathway roadworks related to the Future Canning Bridge Transport Interchange

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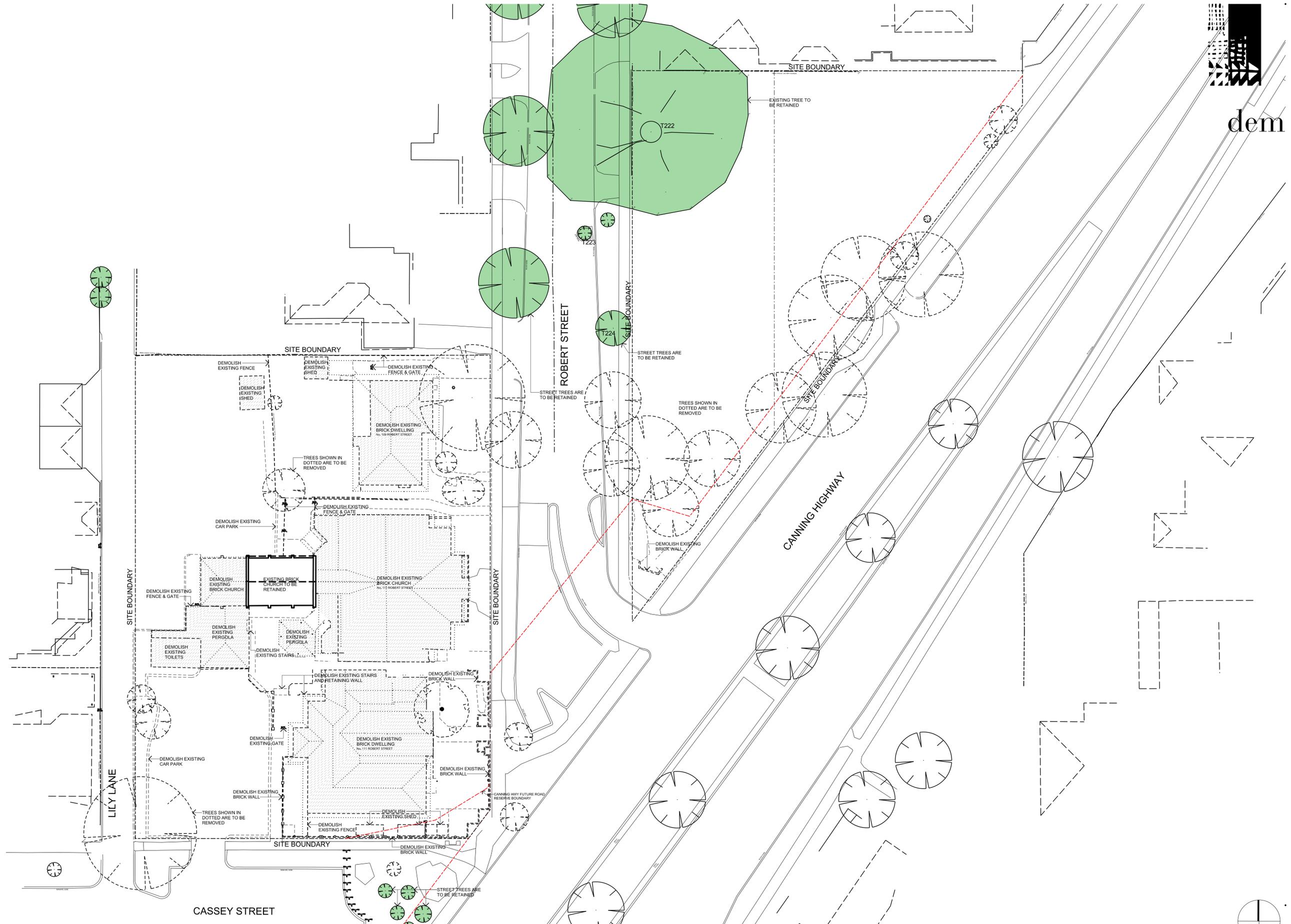
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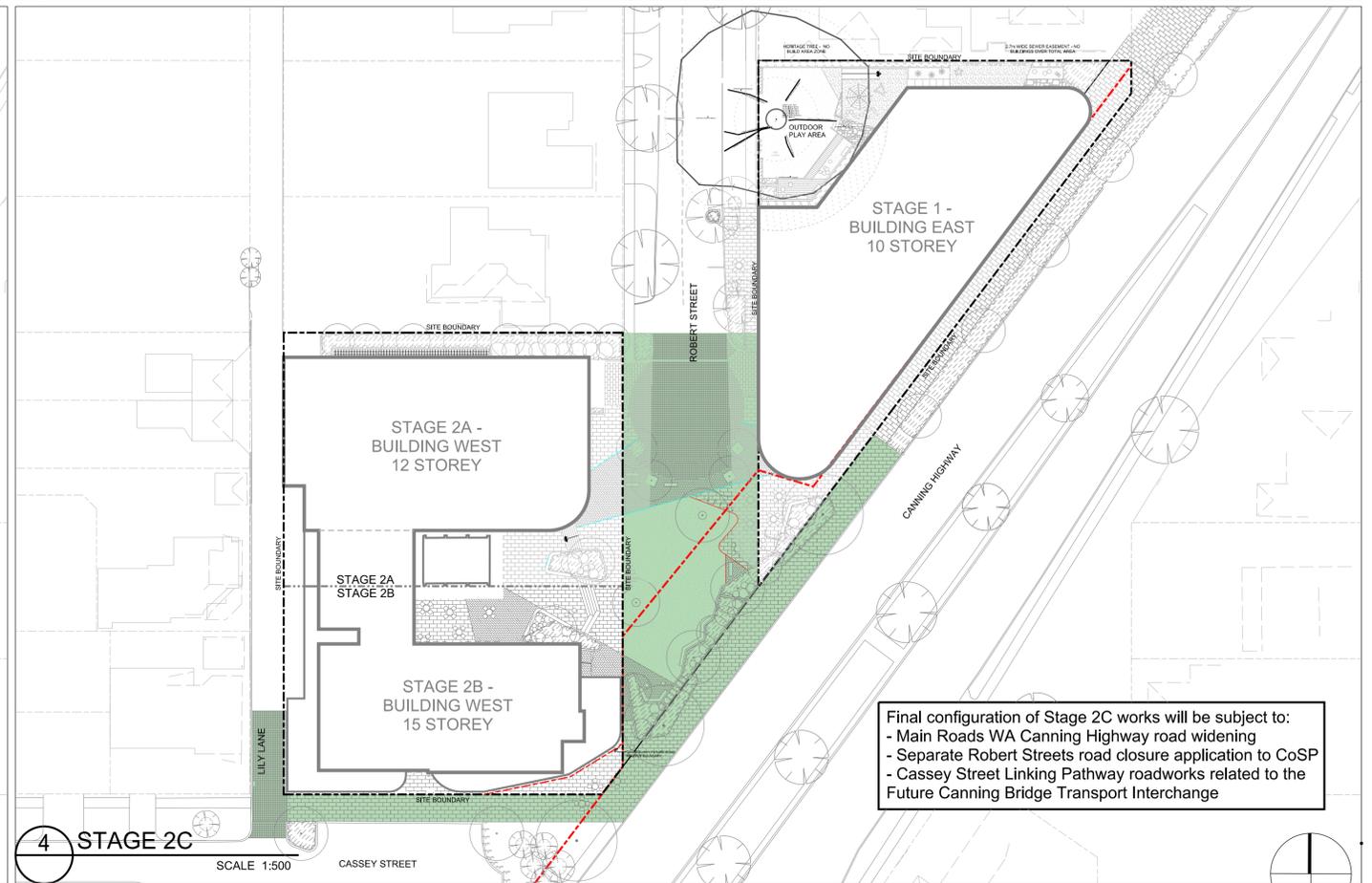
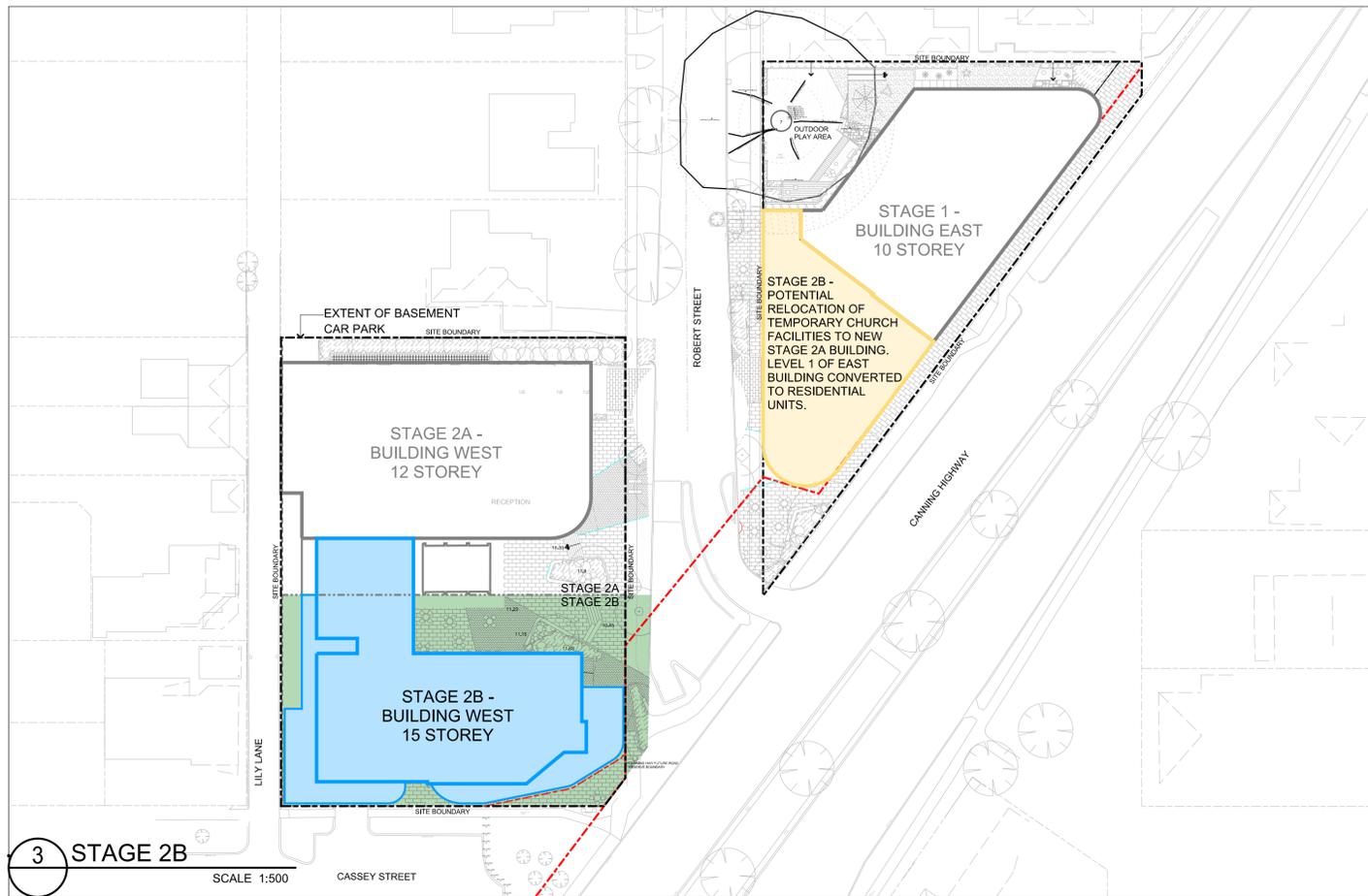
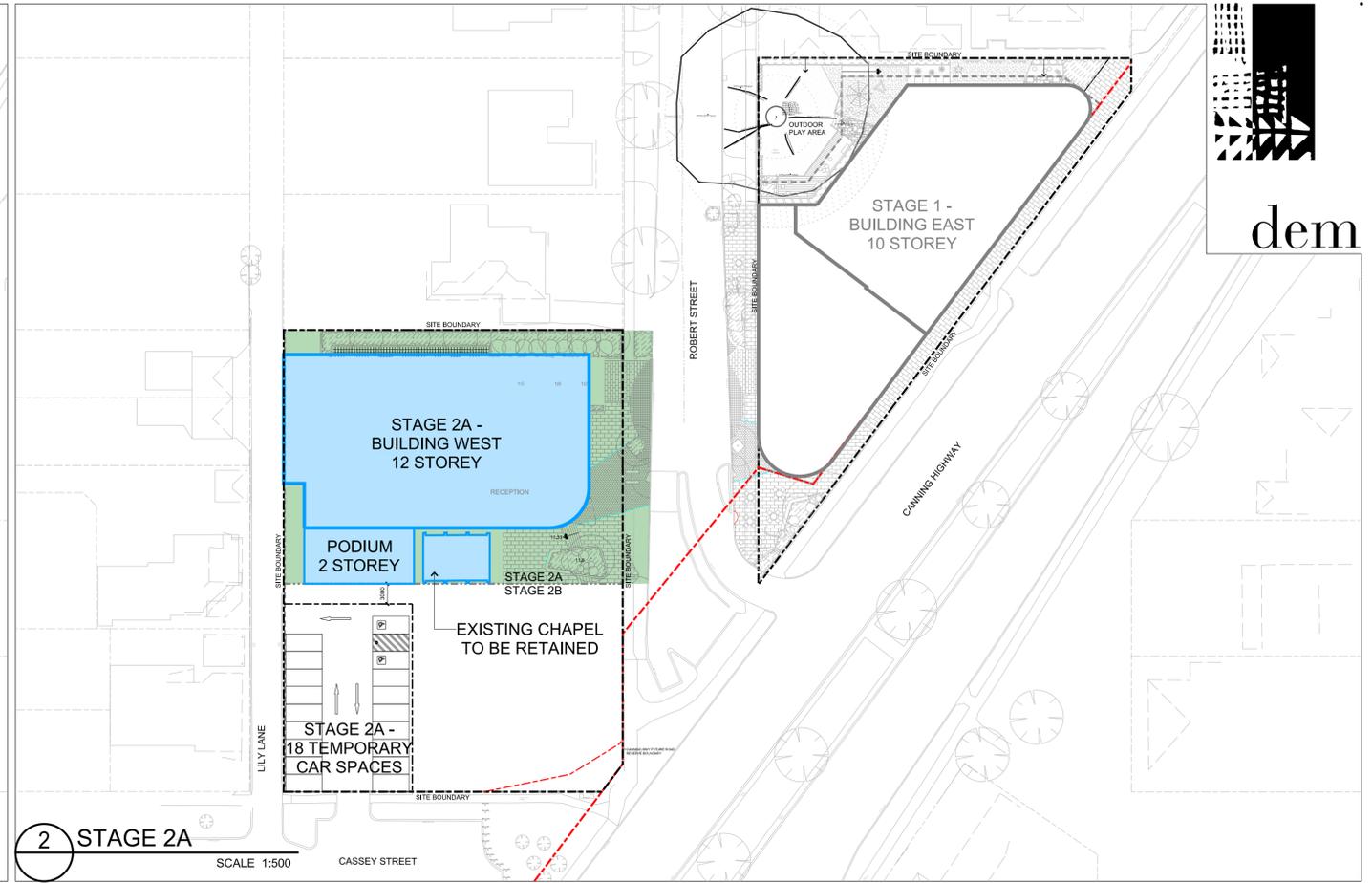
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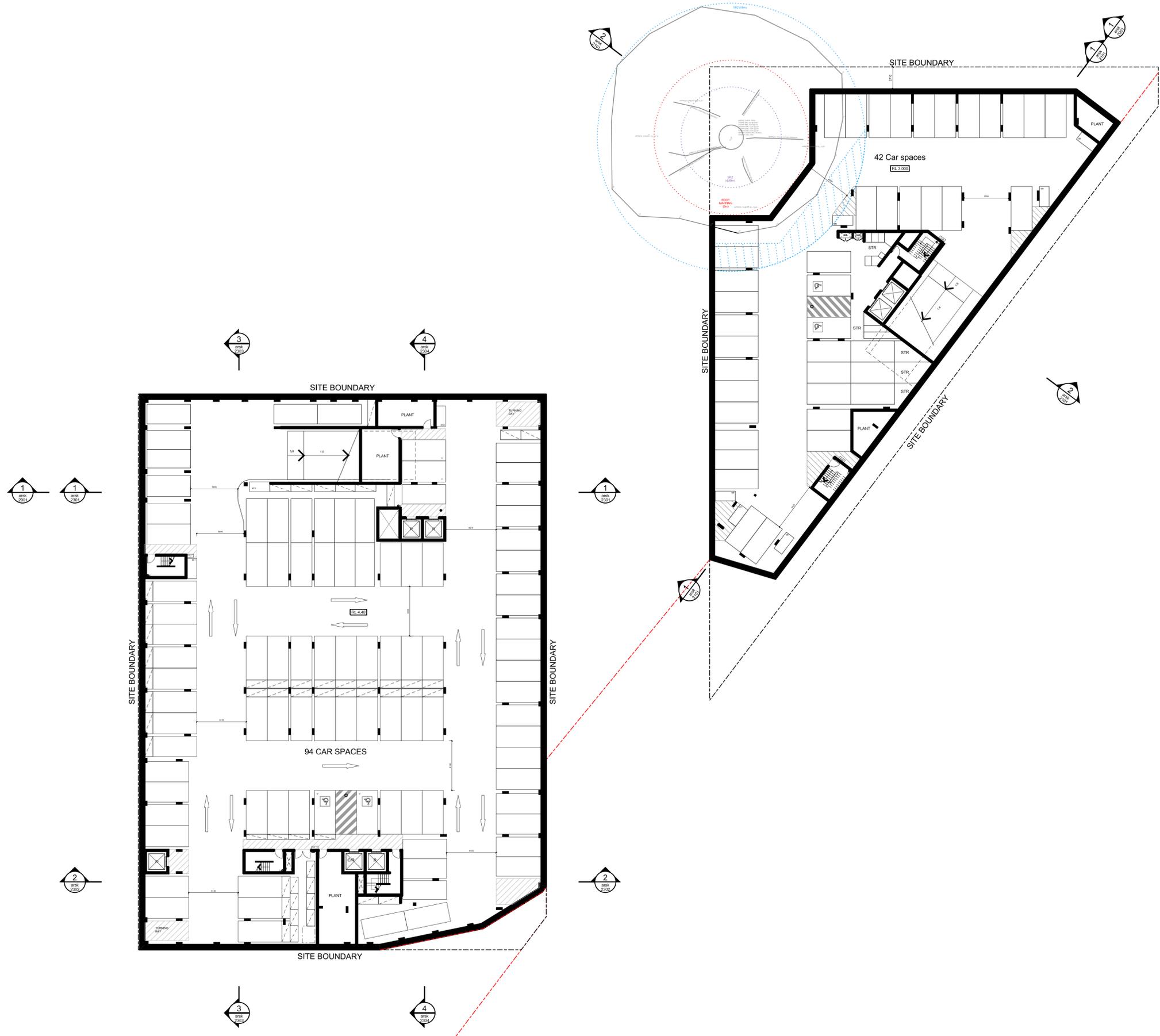




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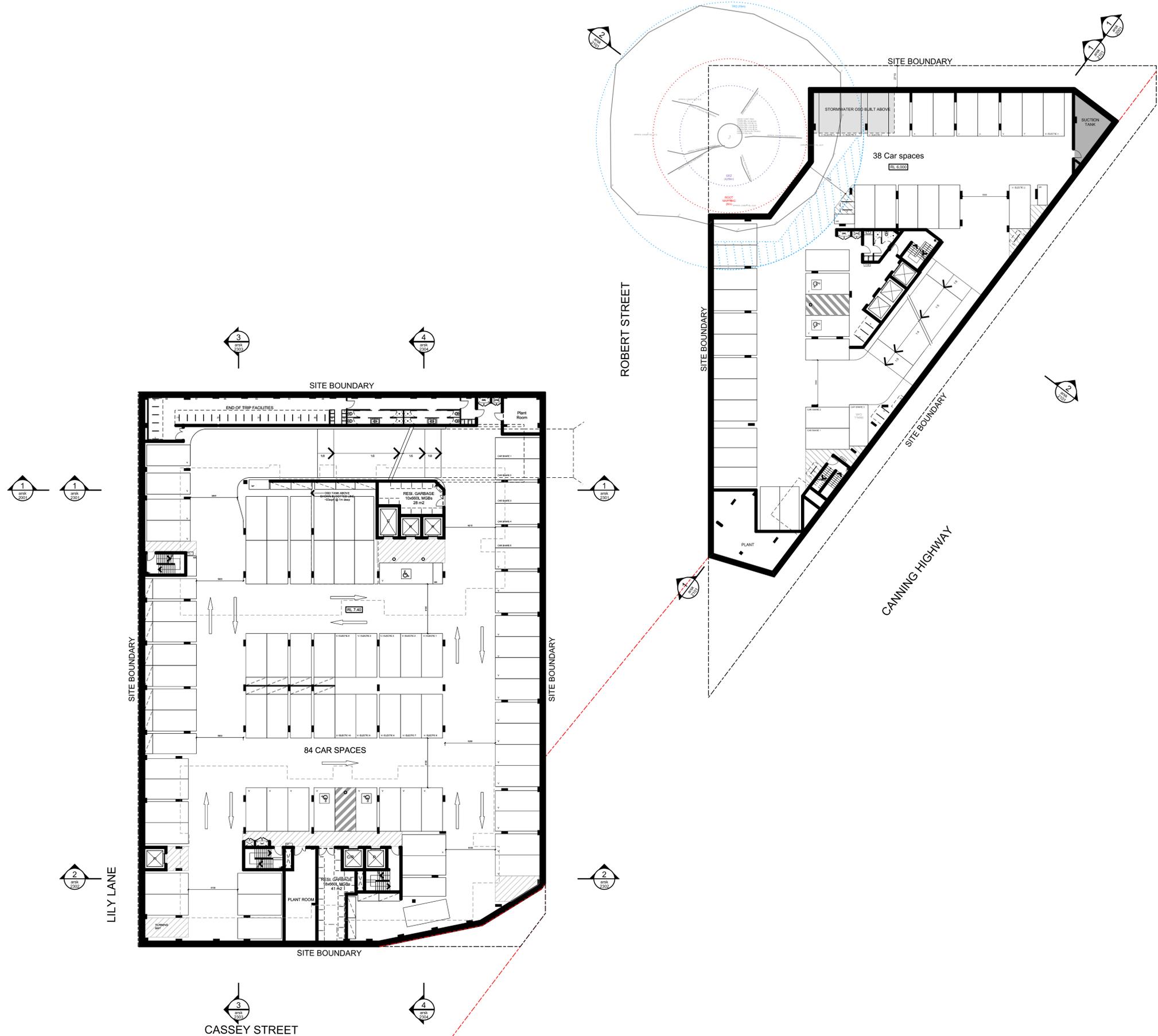
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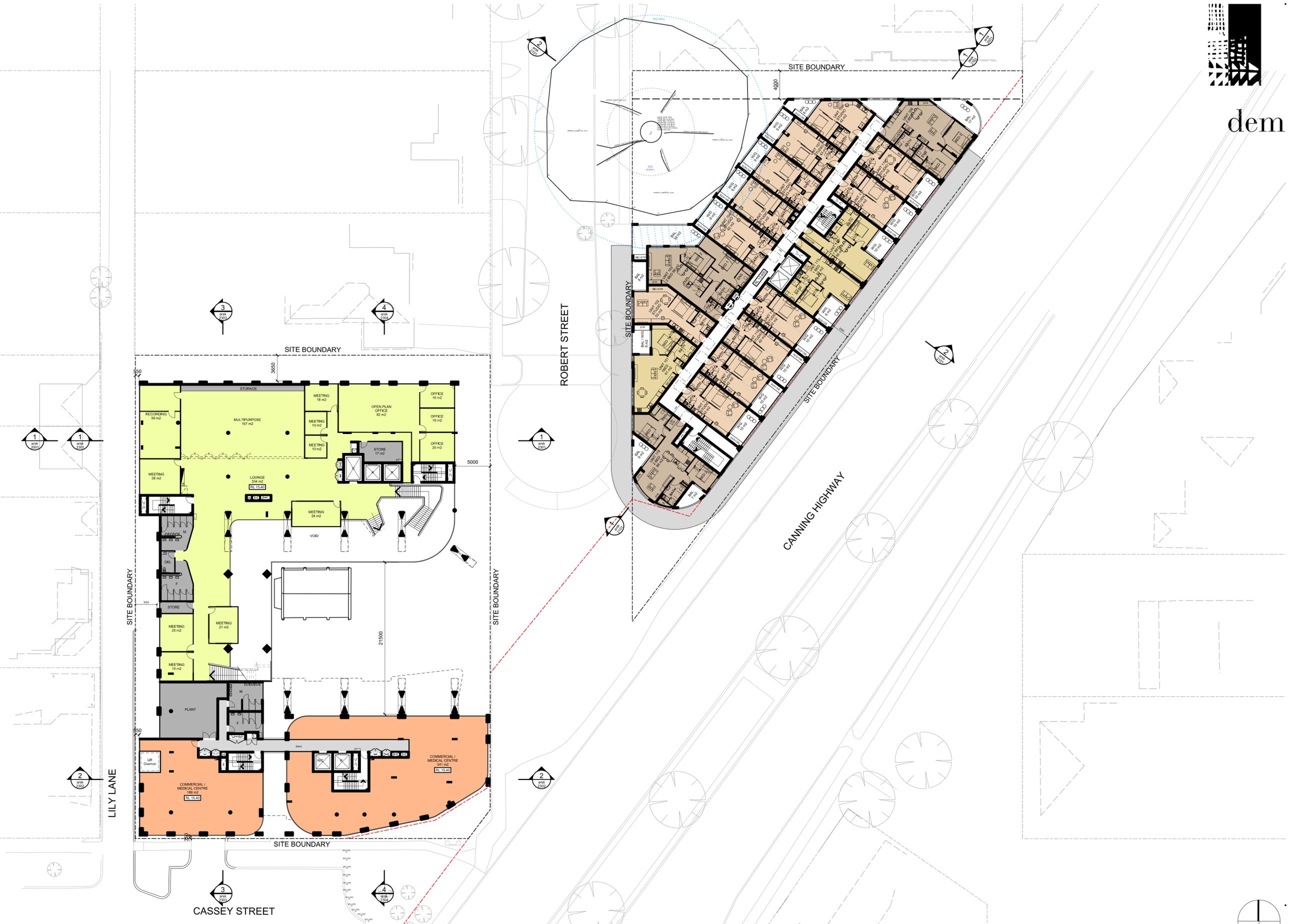
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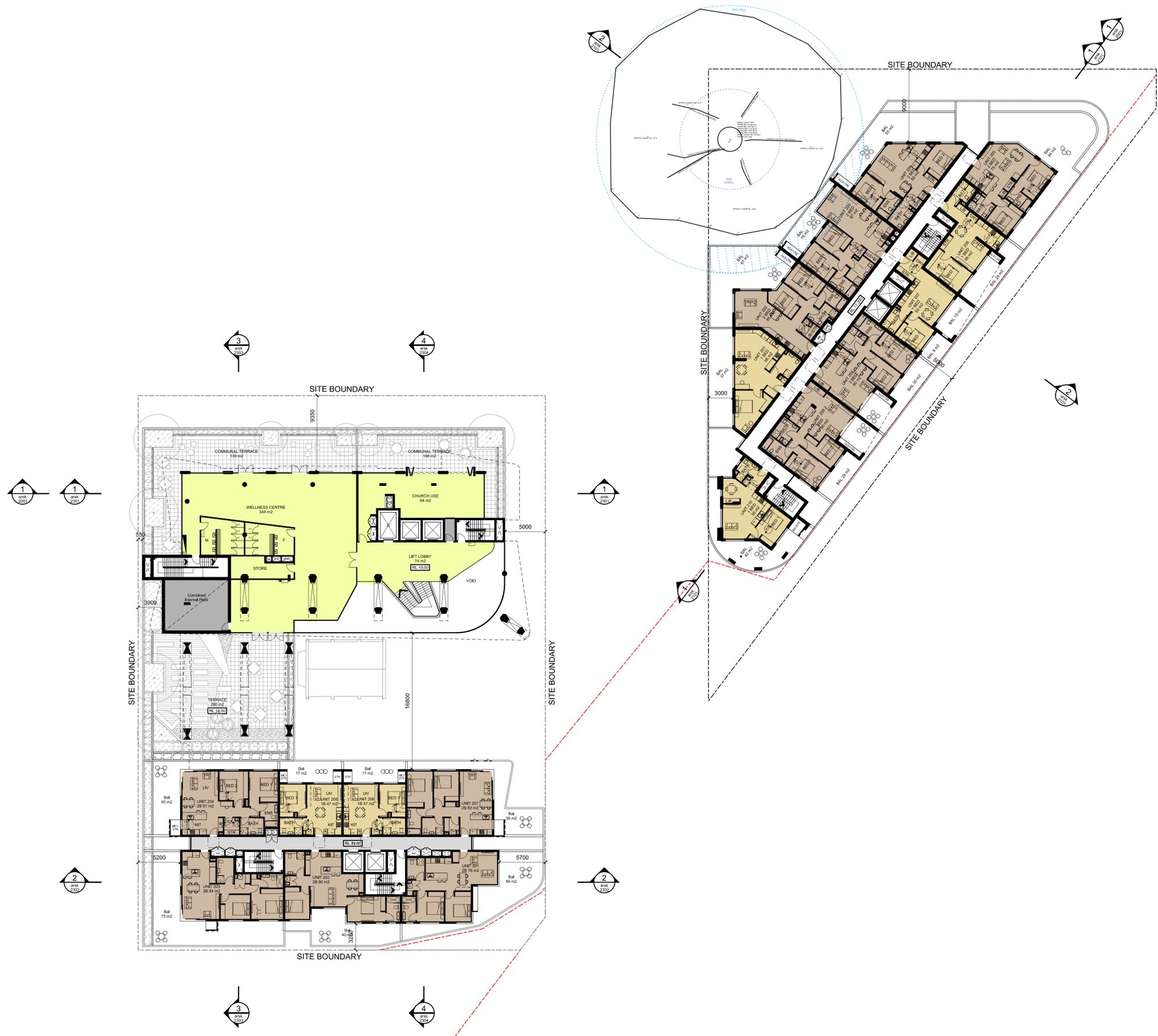
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Level 1 Plan
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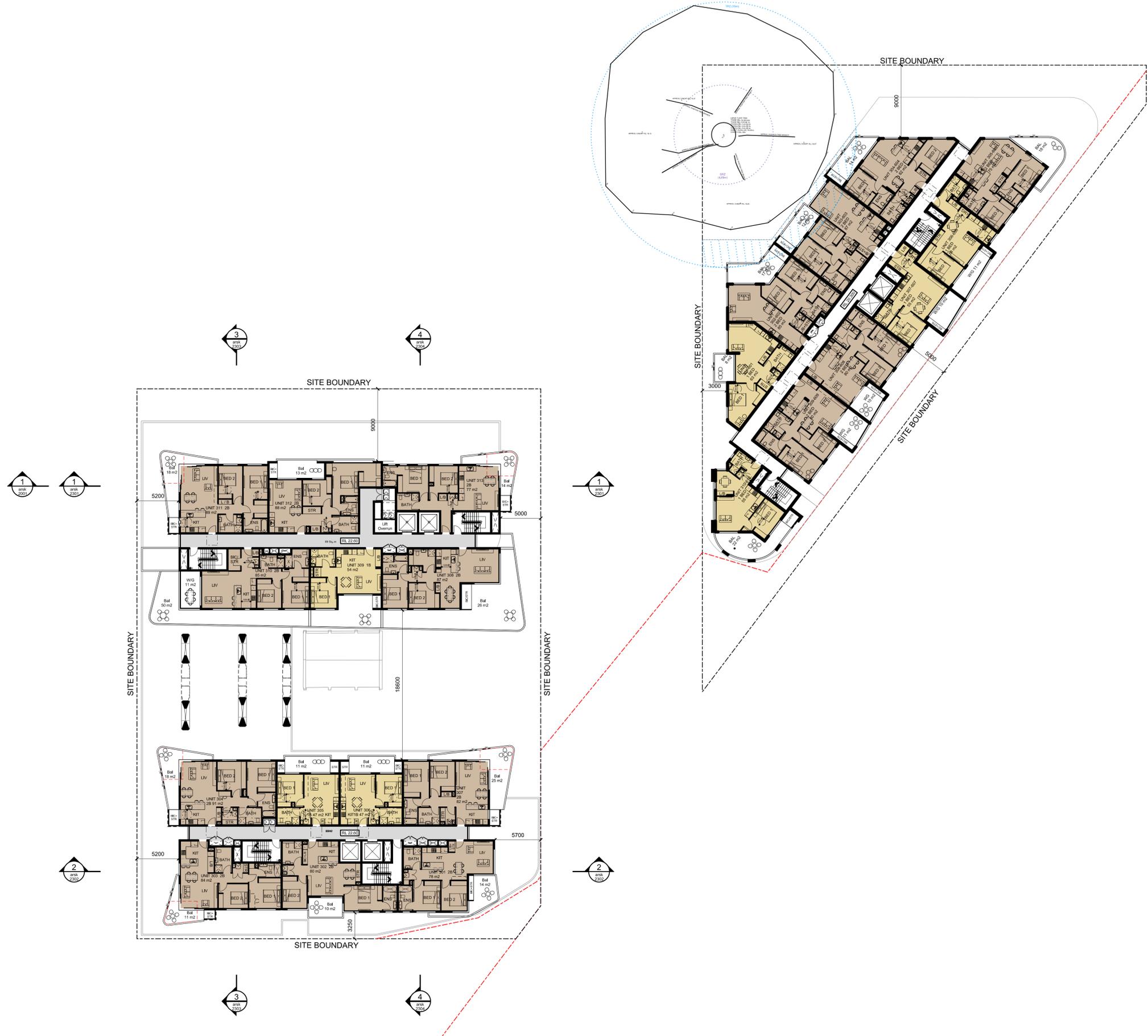
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Level 2 Plan
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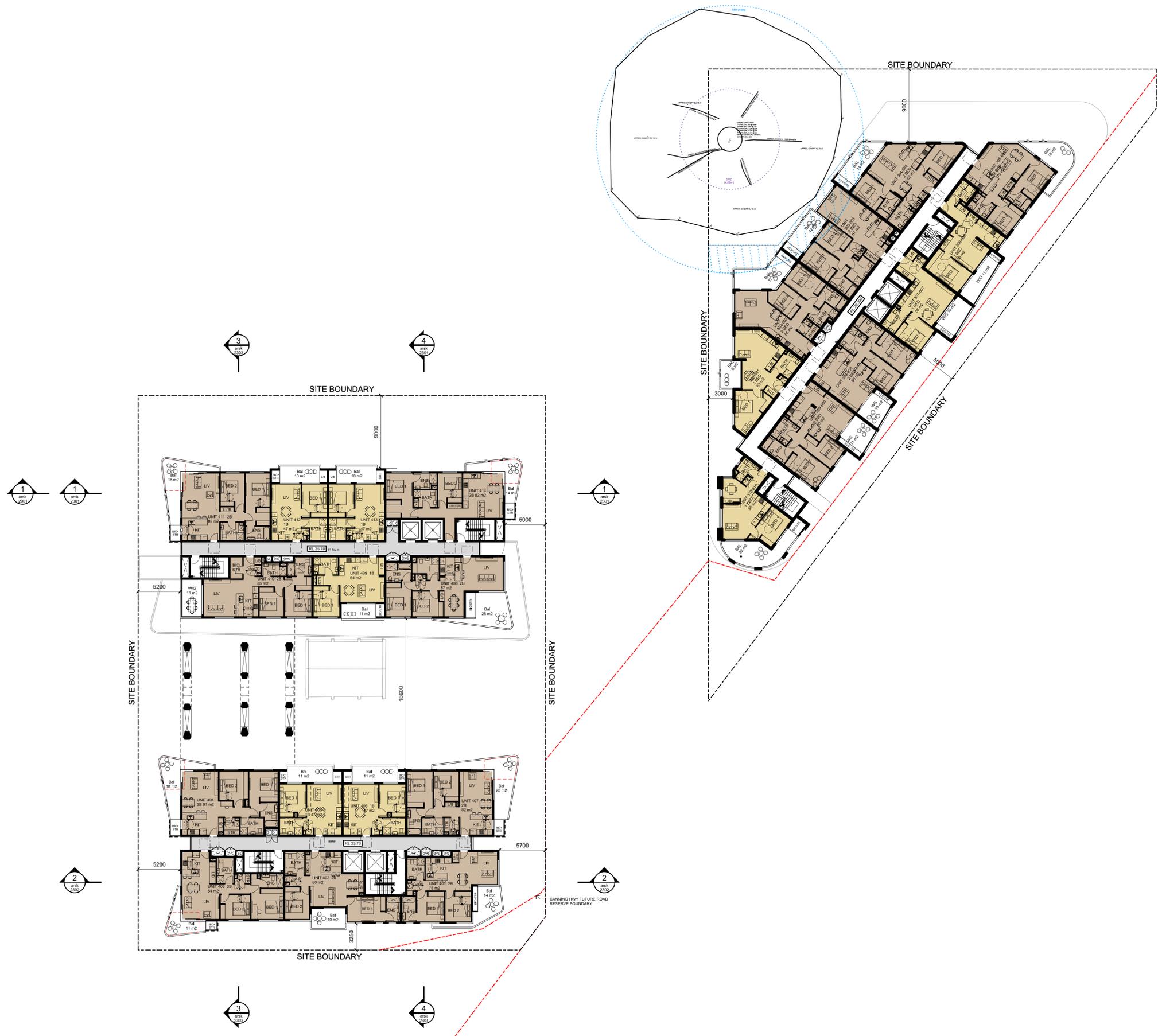
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Level 4-6 Plan
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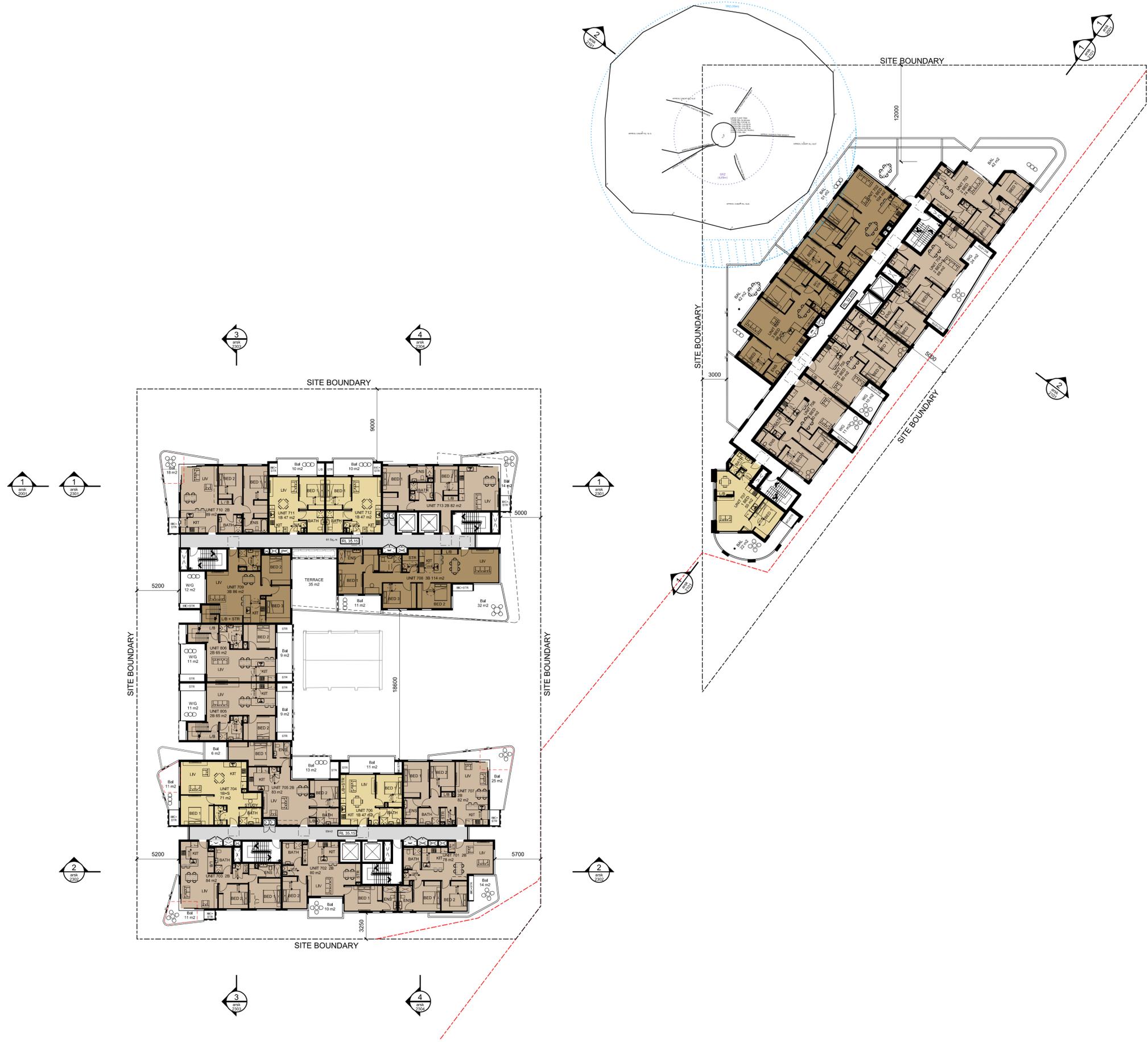
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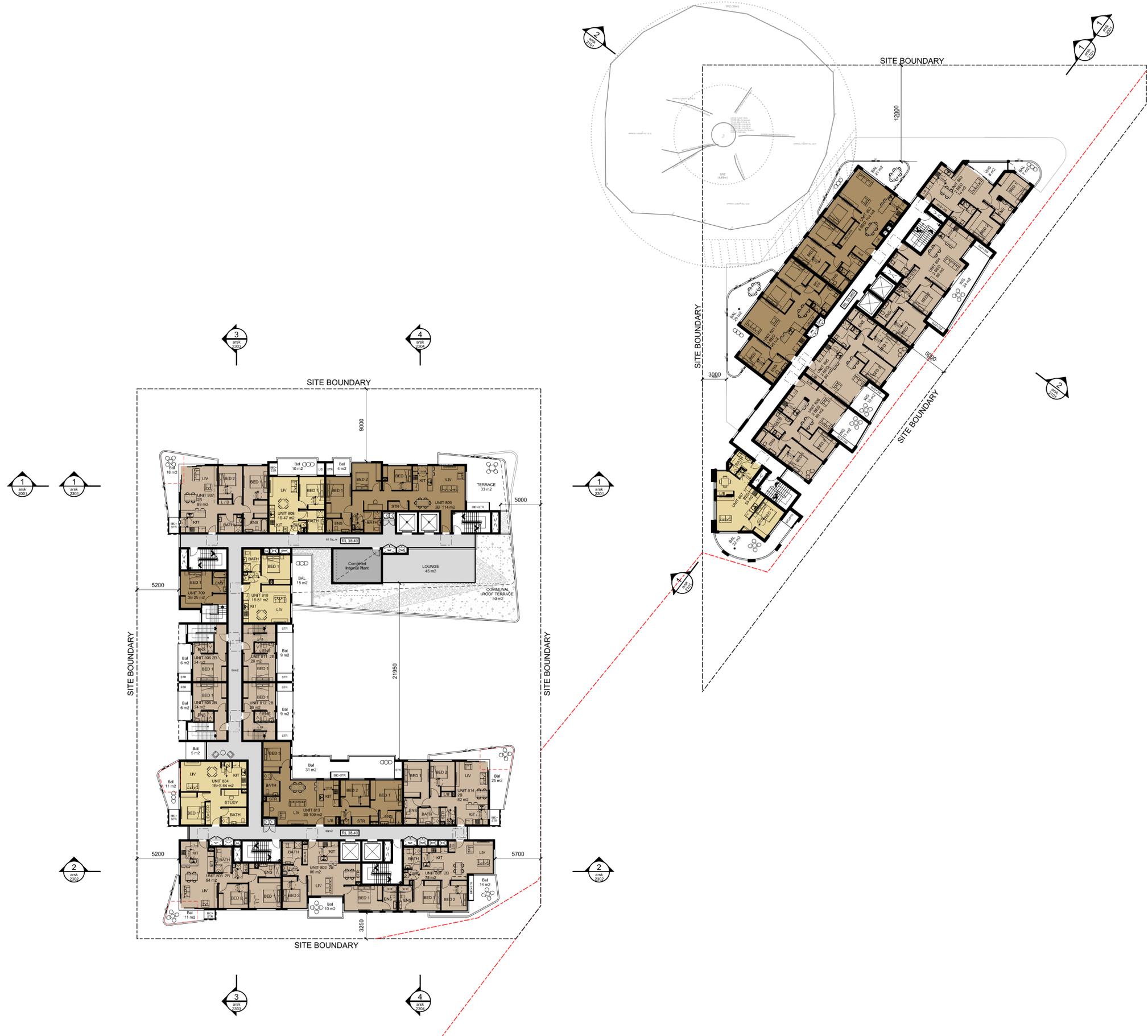
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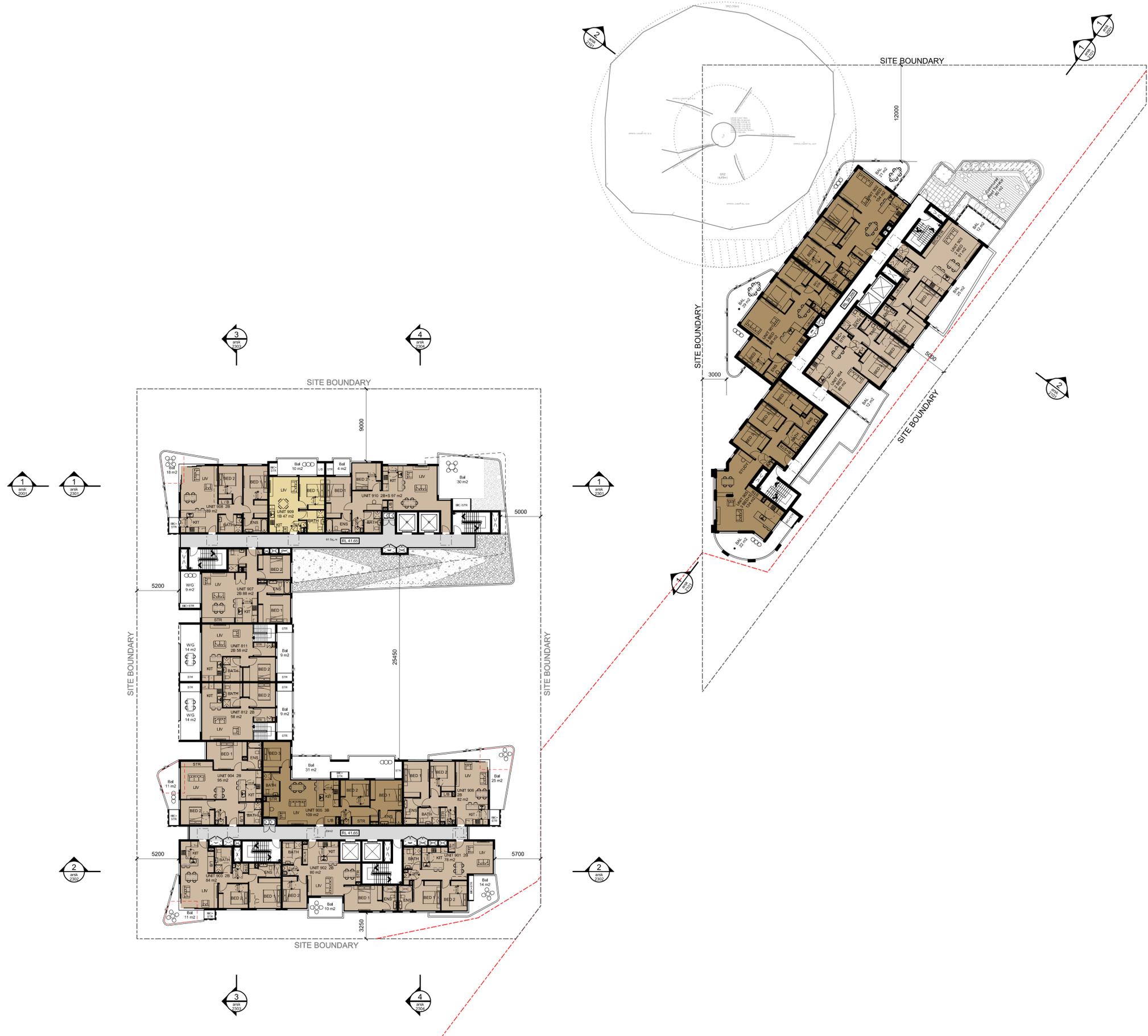
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Level 8 Plan
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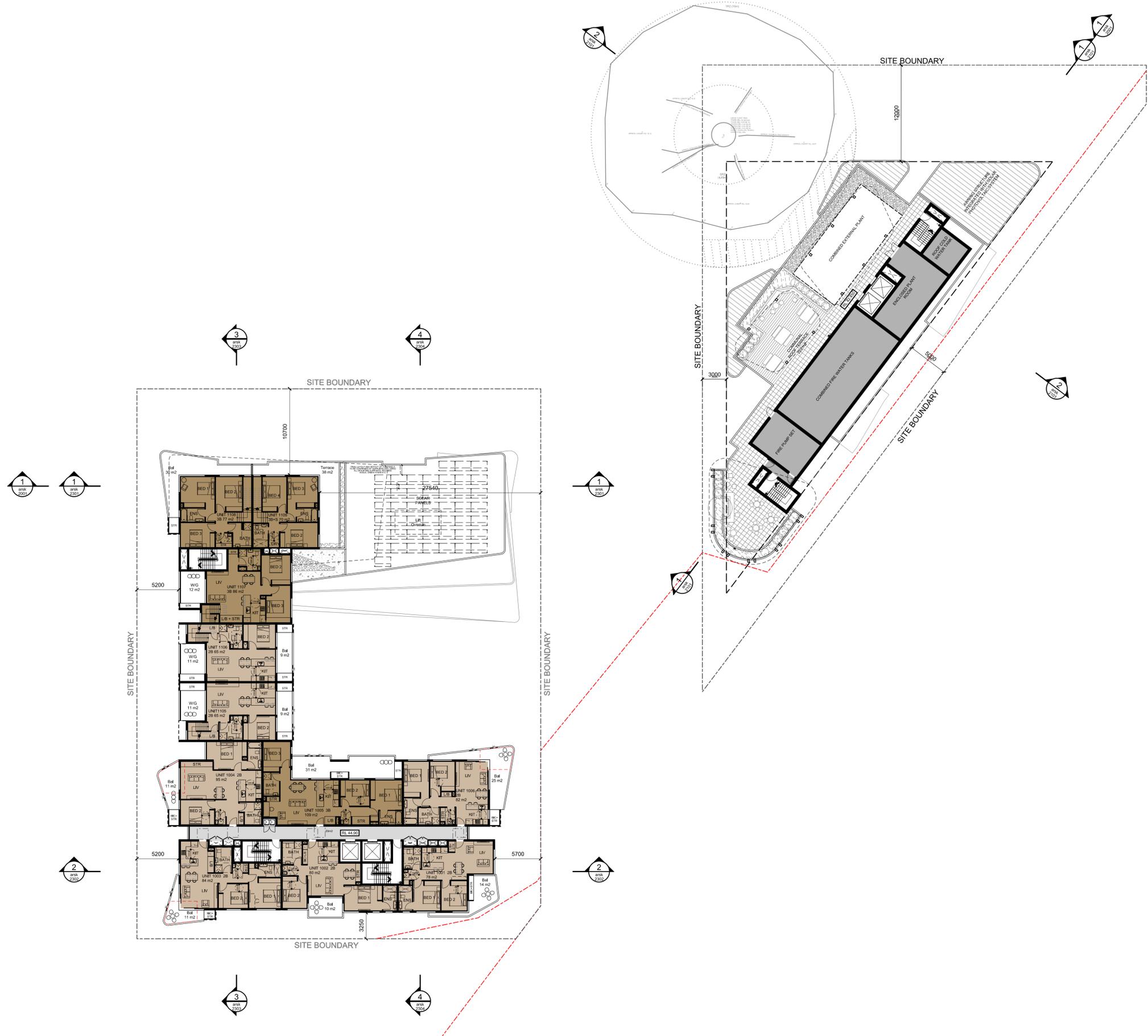
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Level 10 Plan (W)/ Roof Plan (E)
Master Plan - Combined Sites

date 19/02/21
scale 1:250
drawg no. ar-0110

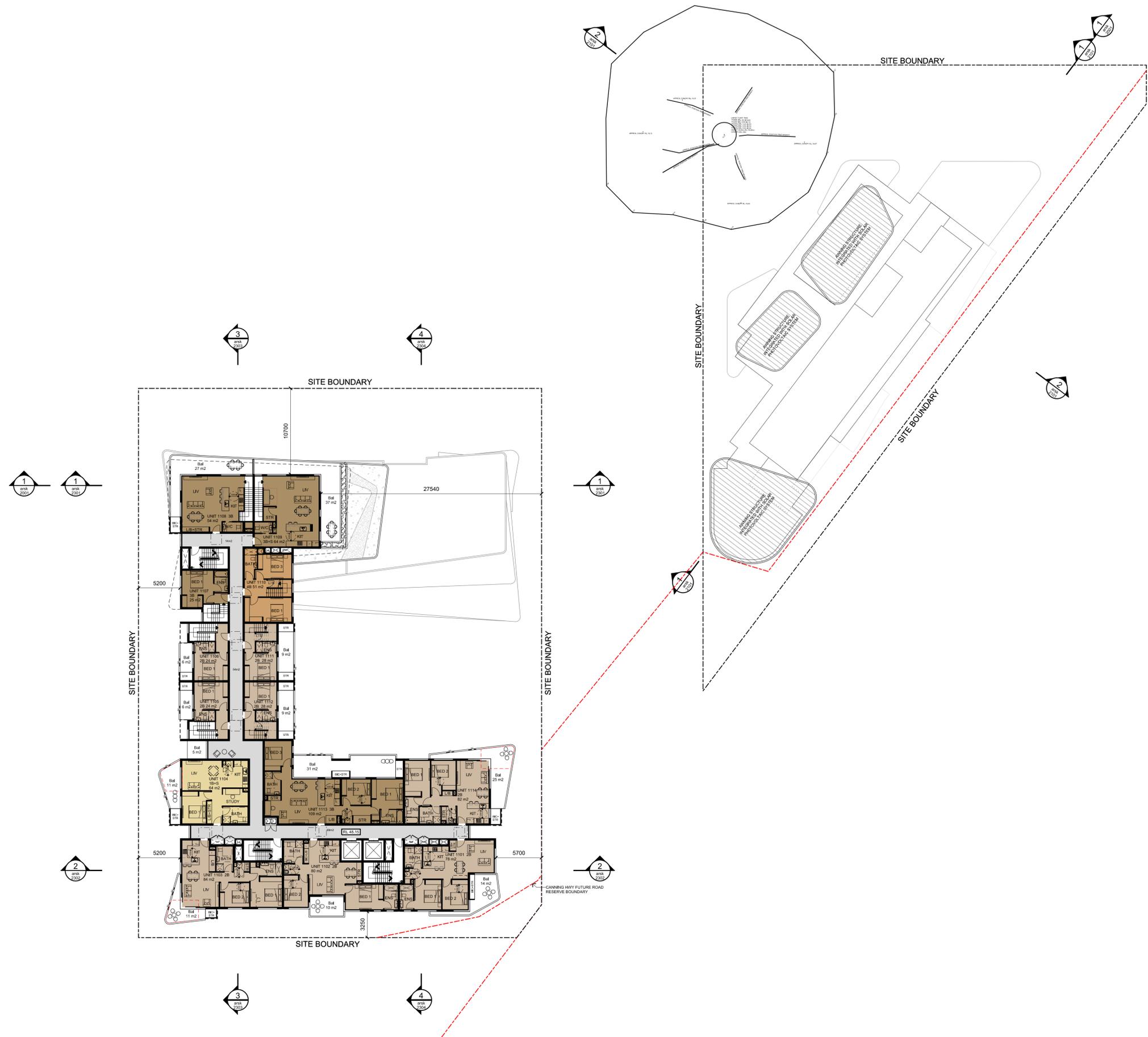
proj no. 4524-00
rev no. b01

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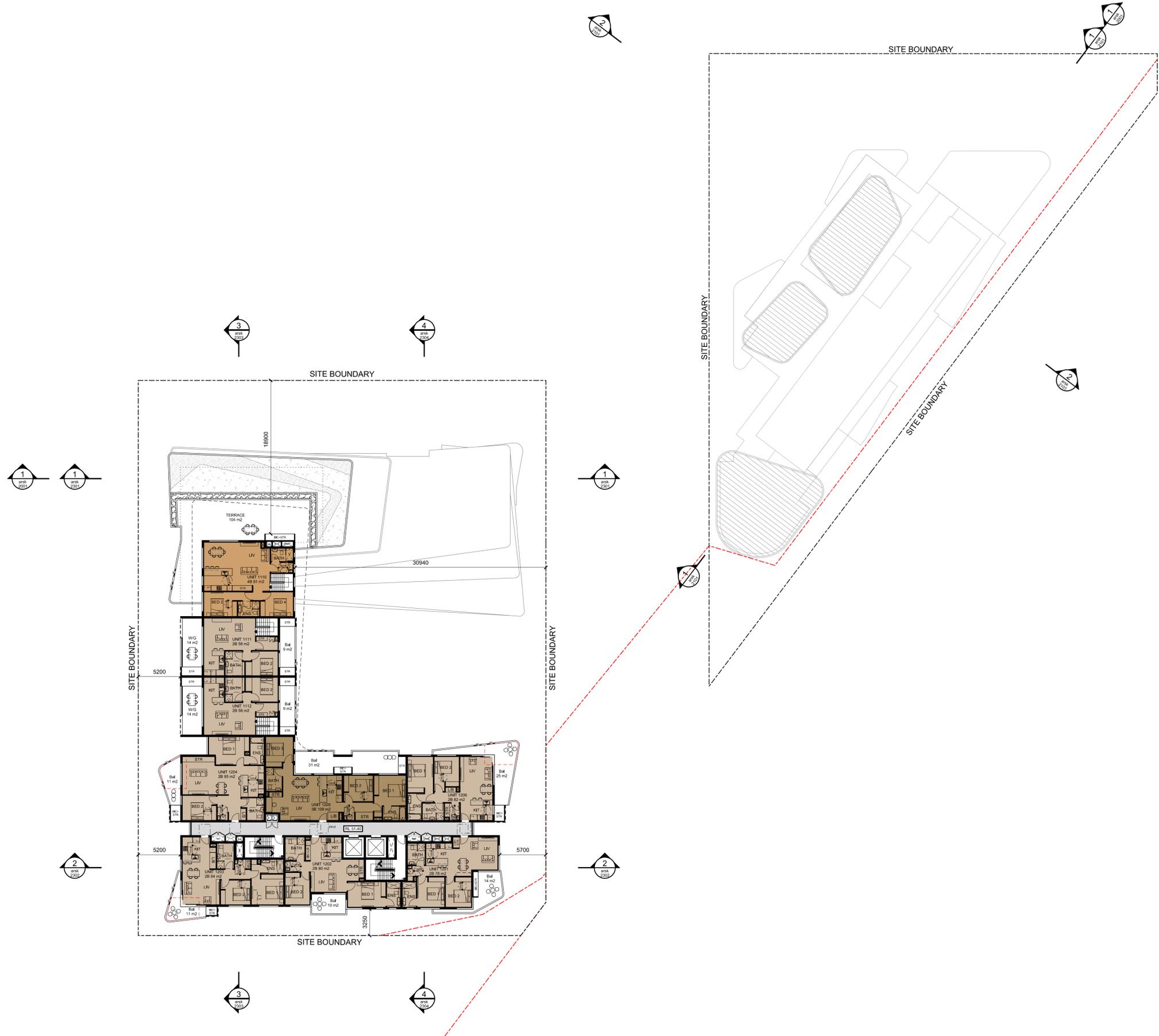
Level 11 Plan(W)/ Upper Roof Plan(E)
Master Plan - Combined Sites

date 19/02/21
scale 1:250
drawg no. ar-0111

proj no. 4524-00
rev no. b01

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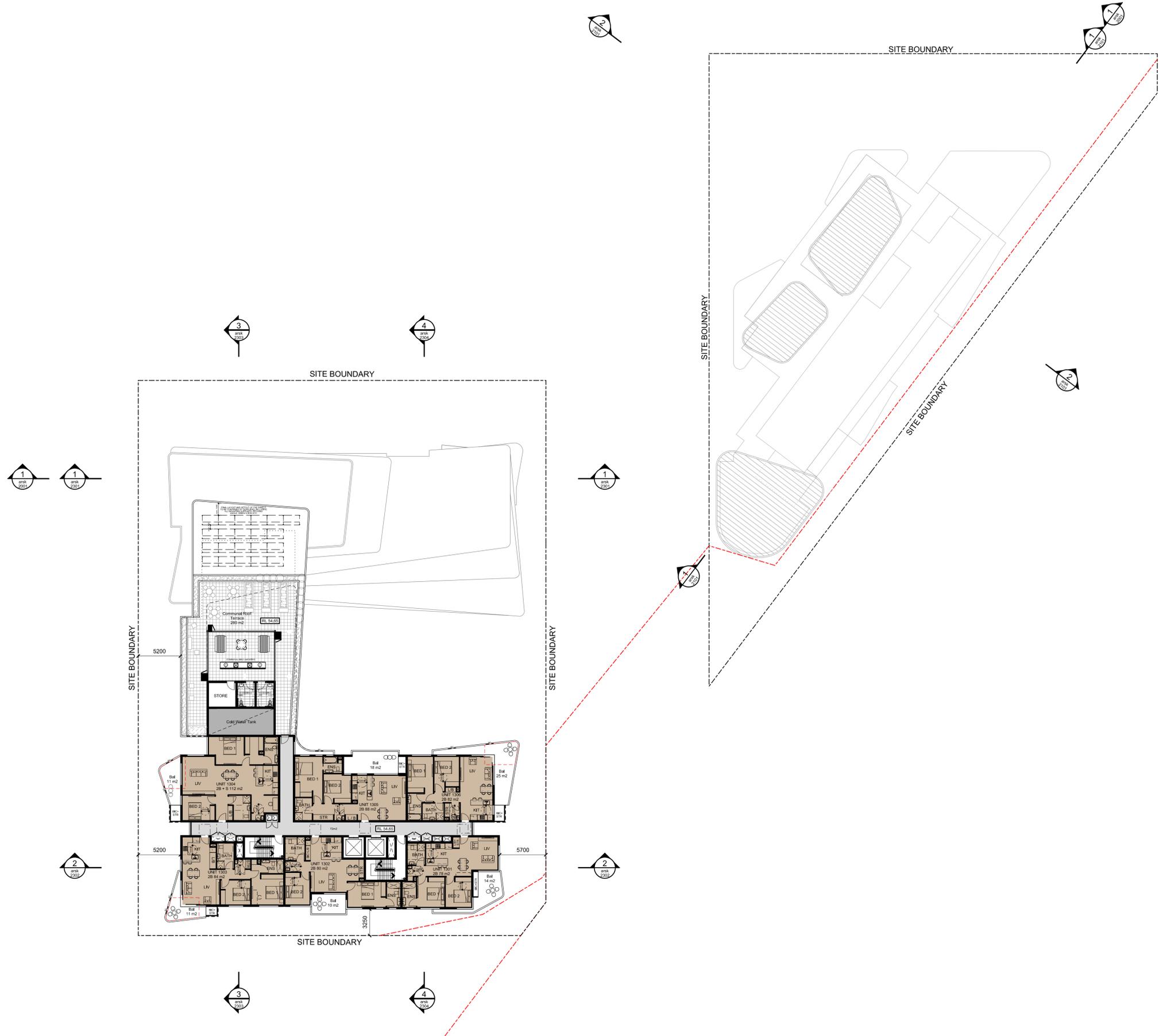
Level 12 Plan
Master Plan - Combined Sites

date 19/02/21
scale 1:250
drawg no. ar-0112

proj no. 4524-00
rev no.
b01

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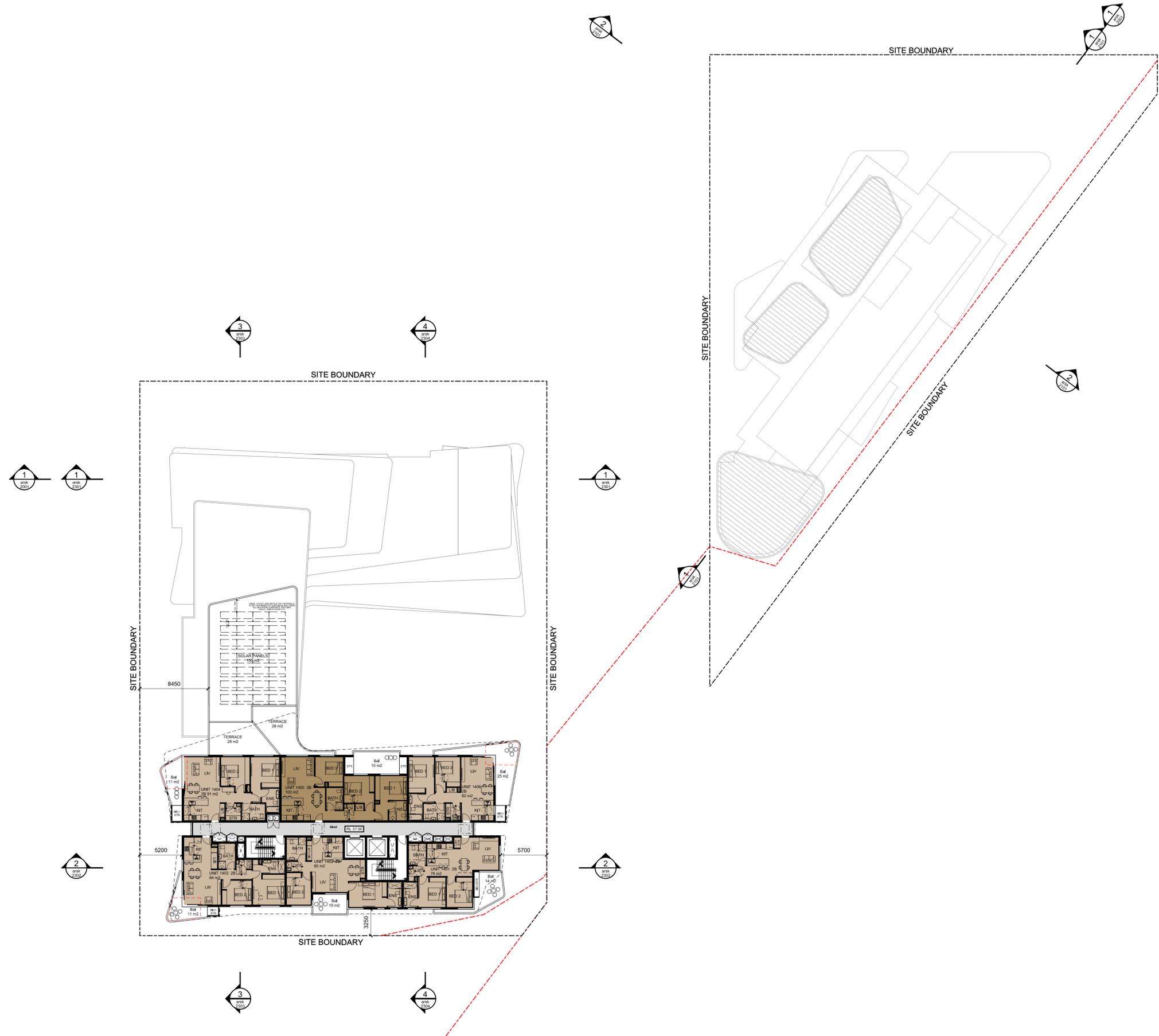
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Level 13 Plan
Master Plan - Combined Sites

date 19/02/21
scale 1:250
proj no 4524-00
rev no ar-0113
b01

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Level 14 Plan
Master Plan - Combined Sites

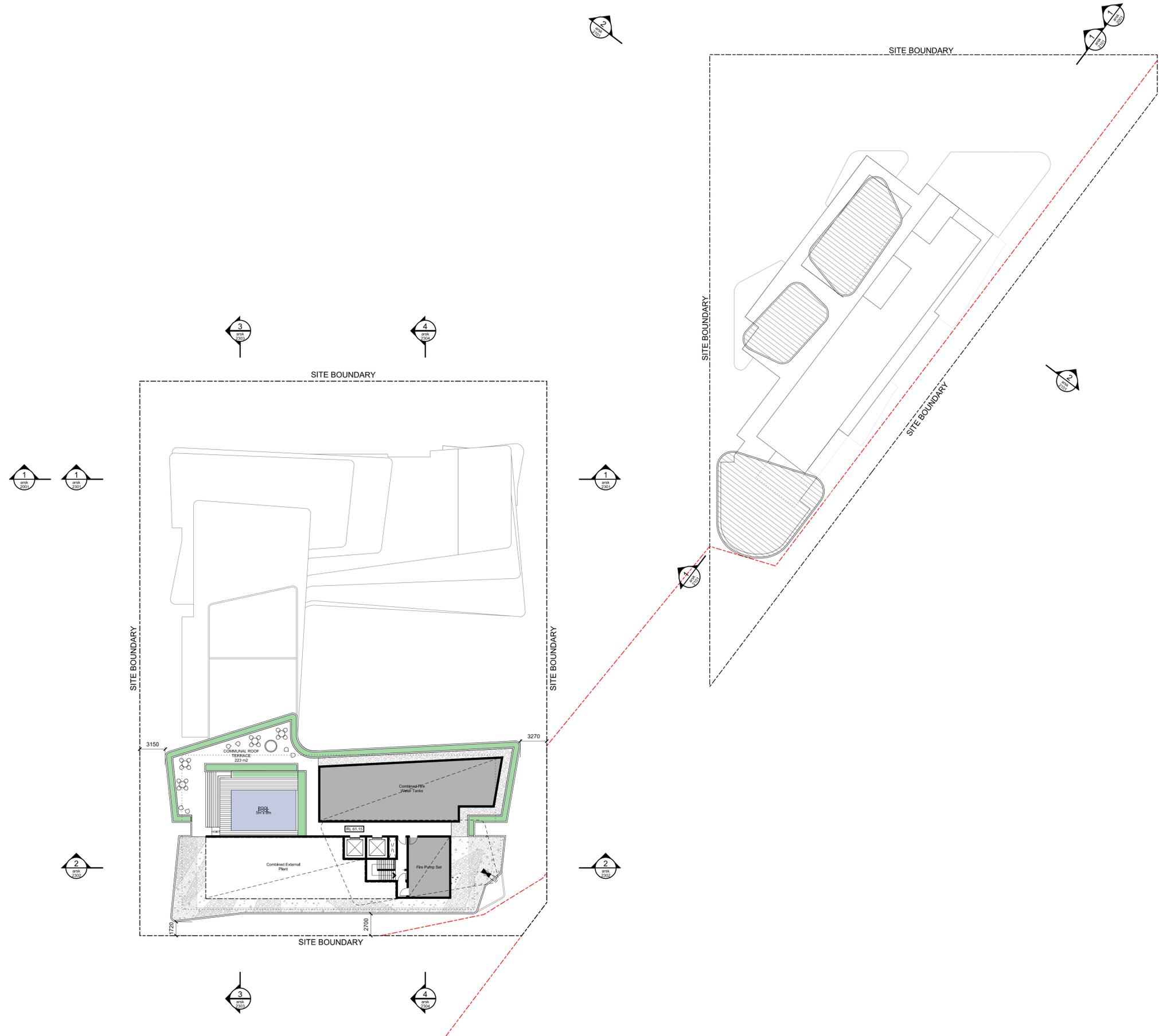
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proj no. 4524-00
rev no. b01

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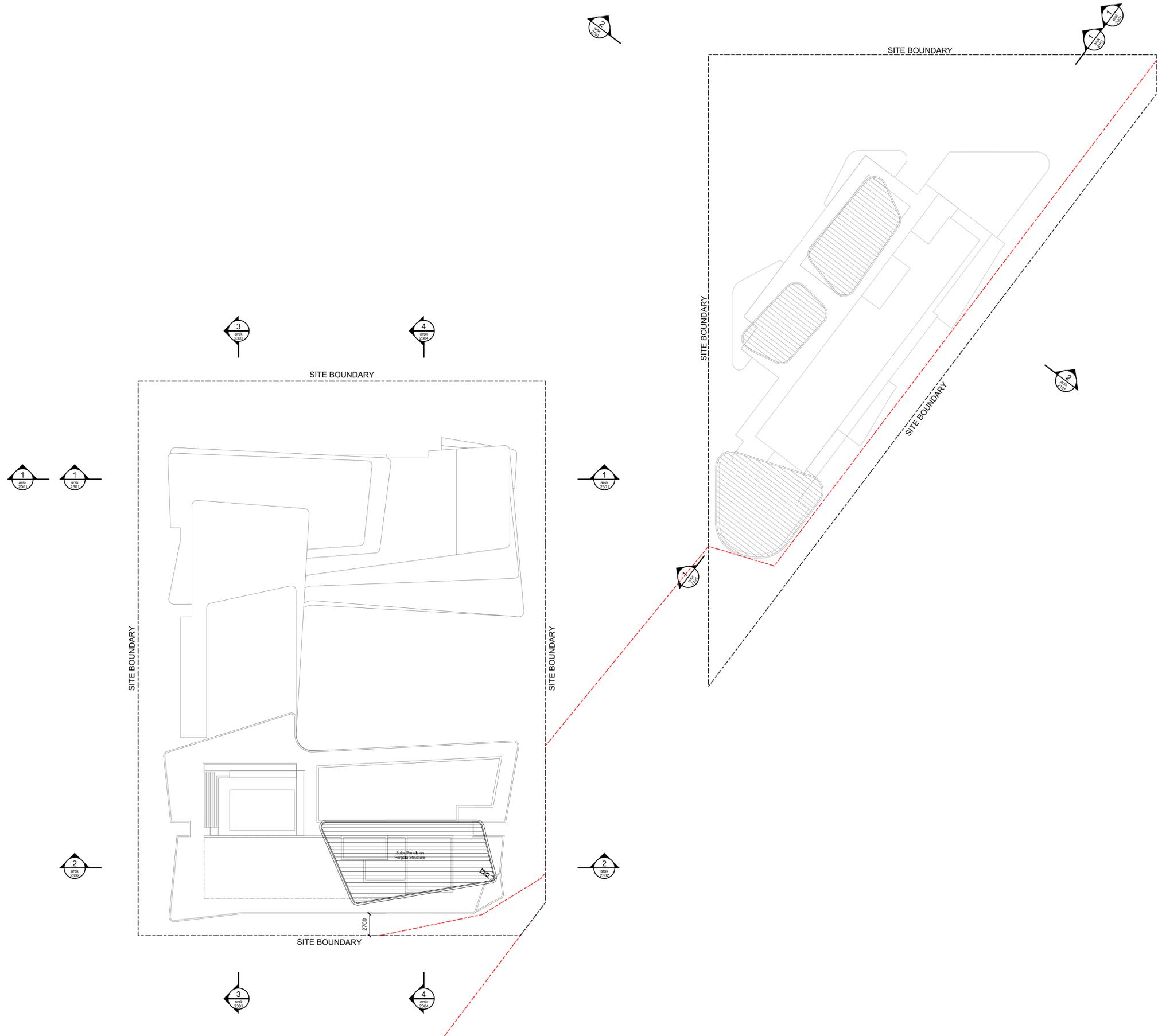
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Level 15 Plan
Master Plan - Combined Sites

date 19/02/21
scale 1:250
proj no. 4524-00
rev no.
ar-0115 b01

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Upper Roof Plan
Master Plan - Combined Sites



APPENDIX B

Calculated Noise Levels and Required $R_w + C_{tr}$ Ratings

Calculated Noise Levels and Required R_w and C_{tr} Ratings				
Location	Floor	Noise Level - dB(A)	Bedroom	Living
Tower 1				
North East Facing	1-2	67	37	32
	3-7	68	38	33
	8-9	67	37	32
North West Facing	1-6	53	23	23
	7-9	57	27	
South East Facing	1-4	70	41	36
	5-6	69	40	35
	7-9	68	39	34
South West Facing	All Floors	62	33	28
Tower 2A				
East Facing	All Floors	63	33	28
North Facing	All Floors	51	23	23
South Facing	All Floors	60	31	26
West Facing	All Floors	54	25	23
Tower 2B				
East Facing	2-7	67	38	33
	8-10	66	37	32
	11-14	65	36	31
East Facing (Setback)	All Floors	59	29	24
North Facing	All Floors	59	30	25
South Facing	2-9	66	36	31
	10-14	64	35	30
West Facing	All Floors	56	27	23

Notes: The required R_w rating can be reduced by reducing the area of glazing.
 The above R_w values have an assumed C_{tr} of 3.
 R_w for winter gardens is for the entire element, ie both windows and winter garden barrier system combined.

APPENDIX C

MRWA Traffic Flow Data

