DESIGN NOTES

PROJECT	Marine Parade Residence
Date	31/03/2021
Subject	Energy / Sustainability Review
JN	123462

INTRODUCTION

CADDS Group have undertaken an initial review of the proposed Marine Parade Residences at 120 Marine Parade, Cottesloe. The intent of the analysis is to

- outline the benchmarks required to be met for the project,
- outline a strategy for compliance;
- Run several simulations to provide indication of requirements;
- And identify a potential specification.

INDUSTRY BENCHMARK

CADDS Group have identified two industry benchmarks applicable to the development in relation to Energy Efficiency / Sustainability:

1. Energy Efficiency Provisions of the National Construction Code (NCC) – Minimum compliance; and
2. Design WA – Residential Design Code – Volume 2 – Apartments (Best practice) Section 4.14 Energy Efficiency.

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Energy Provisions of the NCC
The assessment has been conducted in compliance with JV protocol as specified in the NCC 2019.

The required targets are outlined in part J0.2 heating and cooling loads of sole-occupancy units of a class 2 building and state:

(a) for reducing the heating and cooling loads-

*a. collectively achieve an average energy rating of not less than **6 stars, including the separate heating and cooling load limits**; and*

*b. individually achieve an energy rating of not less than **5 stars including the separate heating and cooling load limits**,*

using house energy rating software and the load limits specified in the ABCB Standard for NatHERS Heating and Cooling Load Limits.

Design WA – Residential Design Code.

Design WA – Residential Design Code – Volume 2 – Apartments 4.14 Energy Efficiency which identifies the following as an acceptable outcome

(a) Incorporate **at least one significant energy efficiency initiative** within the development that exceeds minimum practice.

OR

(b) All dwellings exceed the minimum NATHERS requirement for apartments by 0.5 stars.

An Examples of energy efficient initiatives that exceed current minimum practice:

- ceiling fans to all habitable rooms
- **hot water systems that are more energy efficient than electric storage units**
- provision of an external clothesline to every dwelling, located in an area out of direct view on an external wall or in a breezeway
- **use of a photovoltaic array for communal services**
- installation of a lift with regenerative braking
- **solar powered lighting of external open space, circulation areas and common spaces.**

INITIAL NATHERS RESULTS

The results of the initial thermal analysis are outlined in table 1 below. The table highlights the heating and cooling loads for each apartment and associated star rating.

Table 1 Preliminary NatHERS Ratings – Class 2

Apt No	Level	Proposed Cooling MJ/m2	Proposed Heating MJ/m2	Total MJ/m2	Proposed Star Rating
Unit 1	**1**	19.1	58.8	77.9	3.7
Unit 1A	**1**	31.4	45.3	76.7	3.8
Unit 2	**1**	19.3	70.8	90.1	3.3
Unit 3	**2**	6.2	4.1	10.3	9.1
Unit 4	**2**	7.1	9.3	16.4	8.4
Unit 5	**3**	10.2	1.5	11.7	8.9
Unit 6	**3**	6.4	4.6	11	9.0
Unit 7	**4**	7.6	4.7	16.7	8.8
Unit 8	**4**	8.9	8.2	19	8.3
Unit 9	**5**	7.6	4.7	12.3	8.8
Unit 10	**5**	8.9	8.2	17.1	8.3
Unit 11	**6**	8	6.6	14.6	8.6
Unit 12	**6**	9.5	10.7	20.2	7.9
Unit 13	**8**	35	28.2	63.2	4.4
Total					**7.23**

THERMAL REVIEW

Based on the thermal review CADDS have identified apartments with exposed concrete floors with carpark below resulted in a high heating and/or cooling loads and the lowest NatHERS rating.

In addition, the Penthouse suite with larger exposed external surface area and a high volume of glazing to main Kitchen/Living/ Dining spaces, results in higher heating and cooling requirements for this apartment. While the benefits of high levels of glazing maximise daylight into the space, a balance with thermal comfort is warranted.

Most other apartments are well oriented and are shaded by deep balconies on the west elevation that reduce direct solar gains in summer.

MINIMUM SPECIFICATION

The following specification has been included as minimum, noting the exact construction is yet to be provided.

Table 2 Proposed Specification for Class 2 Apartments

Construction		Materials
External Walls	Structural External Walls:	150mm thick Concrete Walls + Stud frame lining insulated with **Aircell Insulbreak 65** + **R1.5 Insulation batt** or similar + 13mm Plasterboard lining External finishes as per Elevations
Internal & Party Walls	Within Apartments	Studframe + **R1.5 Glasswool batt**
	Lightweight Neighbour/ Party walls:	80mm Pronto Panel Wall - Side 1: + Stud with **R1.5 Glasswool batt** + 2 layers Plasterboard (26mm); Side 2: Stud with **R1.5 Glasswool batt** + 2 layers Plasterboard (26mm)
	Concrete Walls to Core/ Stair:	Precast Concrete Wall/ AFS lined internally +**R1.5 Insulation batt**
Floors	Construction	Form Floor Concrete Slab construction Apartment floors are minimum **257mm thick**
	Covering	Coverings as per plans + Regupol 4515 4-5mm acoustic underlay
Ceilings /Roof:	Exposed Concrete Slab (Balcony/concrete deck above)	**R3.0 Insulation Batts (est 165mm thick)** to ceiling or **R3.35 rigid (ie 70mm K10 Soffit)** fixed to underside of concrete soffit (or equivalent) (Note: **75mm R1.5 Insulation batt** included between apartments)
	Metal Deck Roof	Metal Deck roof, **Anticon 60** (60mm thick, R1.3) to u/s of roof sheet + **195mm thick R4 Insulation Batts** (or equivalent) to Ceiling

COMPLIANCE SOLUTION

CADDS recommends the following specification to exceed NCC minimum requirements and meet Design WA (best practice) Guidelines:

FLOOR INSULATION

- Under Slab insulation (ie 25mm K10 Soffit insulation board or equivalent) to apartments with large areas of exposed floors to carpark. See attached plans for extent of requirement.
    - ***Discussion point*** – take note of where insulation cannot be installed due to functionality or aesthetics

Floors	Exposed	Minimum R1.1 insulation
	Between apartment	None

GLAZING SELECTION

- Use of a high-performance glazing system where required to improve thermal comfort of the apartments
    - ***Discussion point*** – high performance glazing that may be cost prohibitive

A Low-E Neutral/Toned Double Glazing system is recommended for the Penthouse Suite.

Glazing Specification	U-Value	SHGC	Estimated Areas
Double Glazed Grey, in Aluminium Frame ie. 6mm Grey/12mm airspace/6mm Clear	3.9	0.50	Apartments level 1-7
Double-Glazed, Low-E Neutral / Toned in Aluminium Frame	2.9	0.30	Penthouse Suite

SUMMARY

The Performance review in Table 3 below gives a comparison between the original thermal performance of the apartments and the updated results including Compliance solutions.

Table 3 Performance Overview

Apartment Type	Cooling (MJ/m2)	Heating (MJ/m2)	Total Energy (MJ/m2)	Base Star Rating	Thermal Impact	Required Upgrade BCA Compliance	Proposed Star Rating
Unit 1	19.1	58.8	77.9	3.7	*Exposed Slab*	Upgrade 1	7.7
Unit 1A	31.4	45.3	76.7	3.8	*Exposed Slab*	Upgrade 1	7.3
Unit 2	19.3	70.8	90.1	3.3	*Exposed Slab*	Upgrade 1	7.1
Unit 3	6.2	4.1	10.3	9.1			9.1
Unit 4	7.1	9.3	16.4	8.4			8.4
Unit 5	10.2	1.5	11.7	8.9			8.9
Unit 6	6.4	4.6	11	9.0			9.0
Unit 7	7.6	4.7	16.7	8.8			8.8
Unit 8	8.9	8.2	19	8.3			8.3
Unit 9	7.6	4.7	12.3	8.8			8.8
Unit 10	8.9	8.2	17.1	8.3			8.3
Unit 11	8	6.6	14.6	8.6			8.6
Unit 12	9.5	10.7	20.2	7.9			7.9
Unit 13	35	28.2	63.2	3.8	*High Glass %*	Upgrade 2	7.6
Average Star Rating				**7.23**			**8.27**

Based on CADDS Preliminary modelling, the apartments with proposed upgrades incorporated would achieve an 8-star average NATHERS Rating, which is +2 Star higher than current NCC requirements, and +1.5 Stars above the Design WA (best practice) guidelines. This would demonstrate a 48% improvement in thermal performance of apartments when compared to NCC Minimum compliance.

Table 4 Calculated Energy reductions in comparison to NCC

	Average Star Rating	Average Energy use (MJ/m2)	% Improvement in Thermal performance (MJ/m2) compared to Min. NCC Requirement
Min. NCC Requirement	6	39	0%
Achieved Rating	8	20	48%

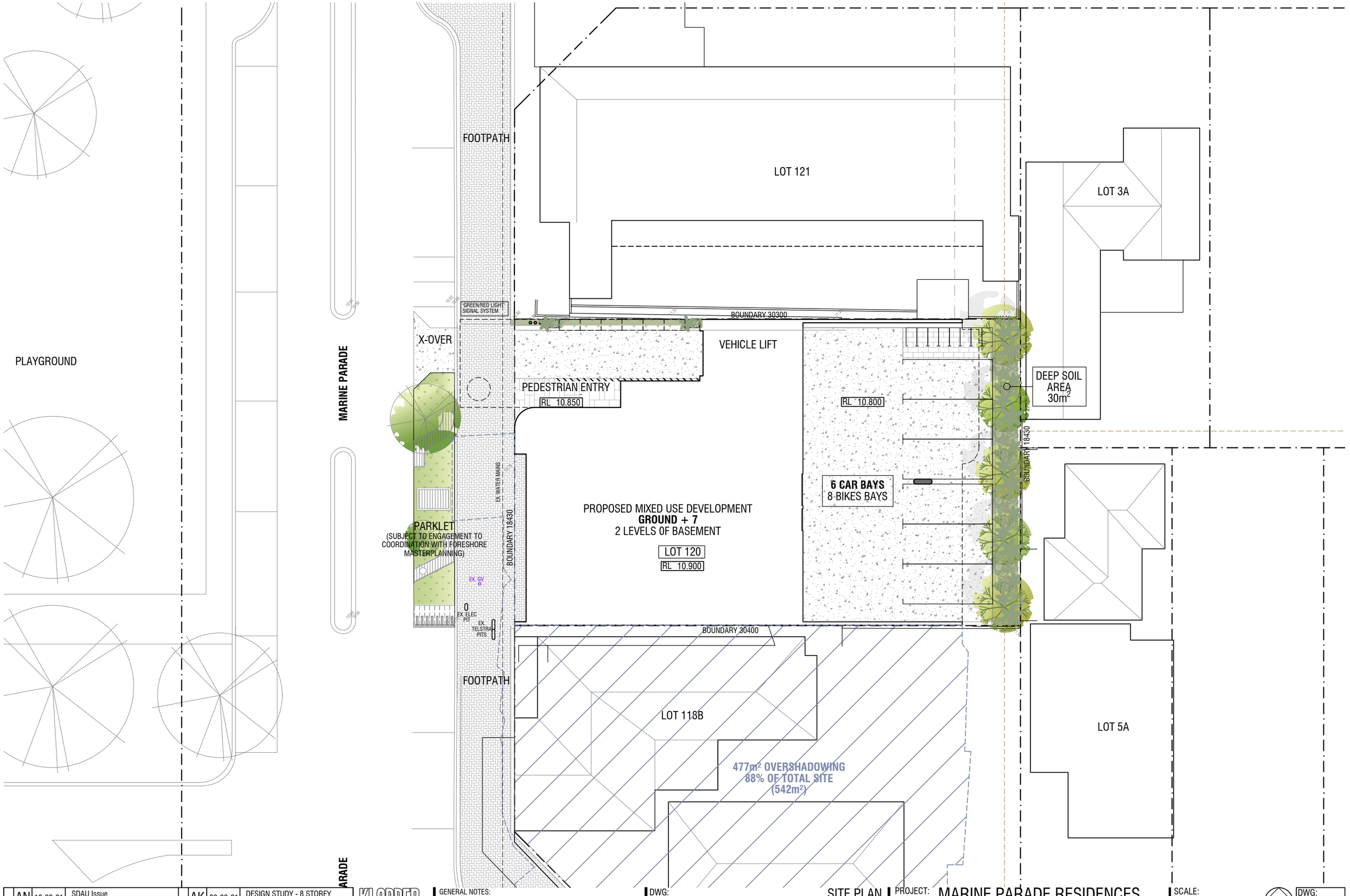
The development will also incorporate a number of additional best practice sustainability initiatives from Design WA Guidelines, such as:

- **Hot water systems that are more energy efficient than electric storage units:**
  - Steibel Eltron Instantaneous Hot water units to be installed to all apartments

- **Use of a photovoltaic array for communal services:**
  - Proposed 15-20KW Solar PV System installed to roof, used to power communal services. The solar power system will also be used to power lighting of external open space, circulation areas and common spaces.

APPENDIX 1

Marked up Plans



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AL	09-03-21	CLIENT REVIEW - 8 STOREY	
AK	02-03-21	DESIGN STUDY - 8 STOREY	
AJ	25-02-21	REVISED DEVELOPMENT APPLICATION	
AI	27-11-20	DEVELOPMENT APPLICATION	

KLOPPER & DAVIS ARCHITECTS

GENERAL NOTES:
1. CHECK ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF WORKS.
2. COORDINATE WORKS WITH ALL CONSULTANTS DRAWINGS.
3. DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.
4. REFER TO INTERIOR DRAWINGS FOR PLUMBING SETOUTS.
5. TILE UNDER ALL CABINETWORK U.O.N. DIMENSIONS ARE FROM FFL

DWG: SITE PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:200

JOB#: 1902

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DWG: A102

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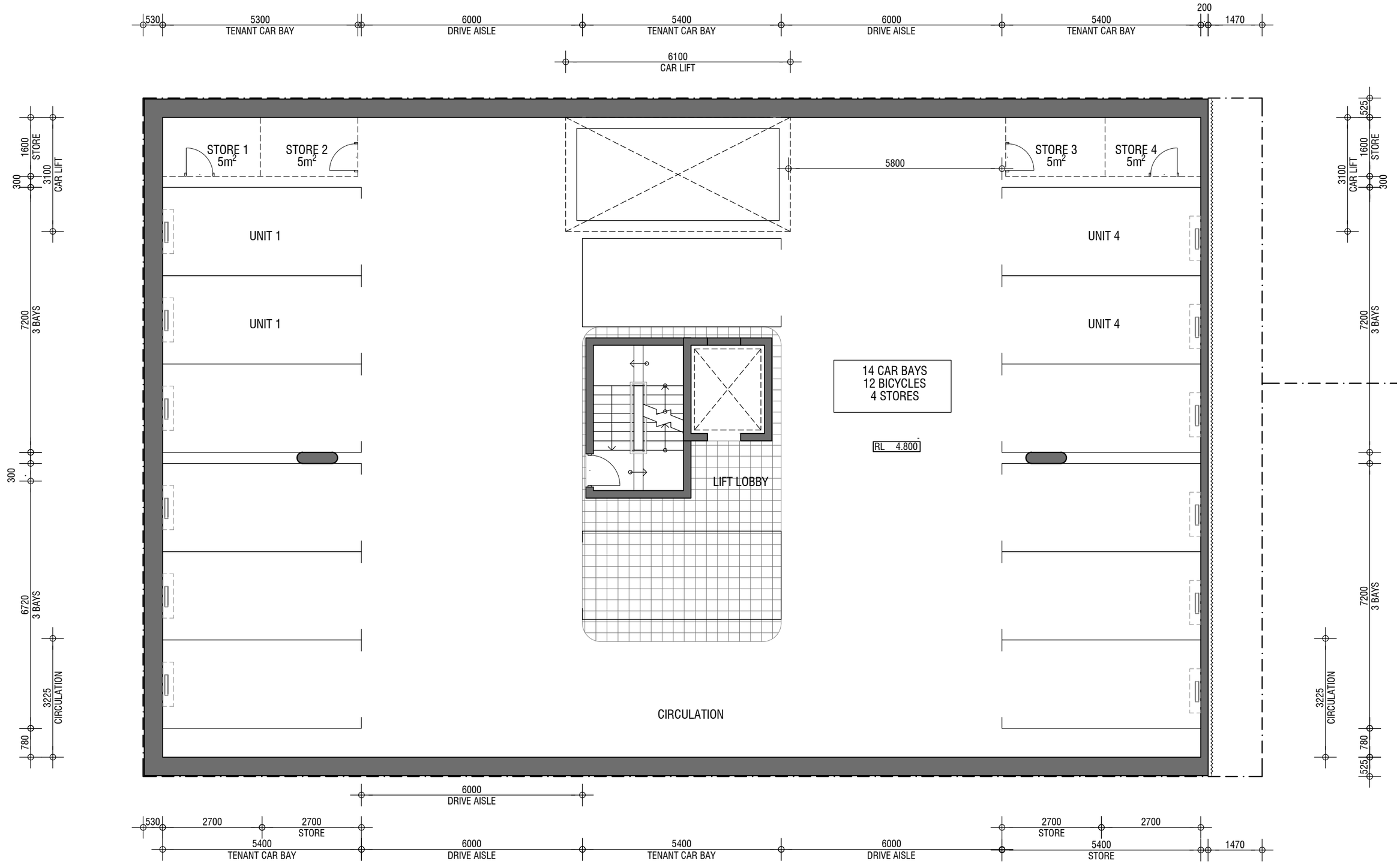

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DWG: BASEMENT 2 PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

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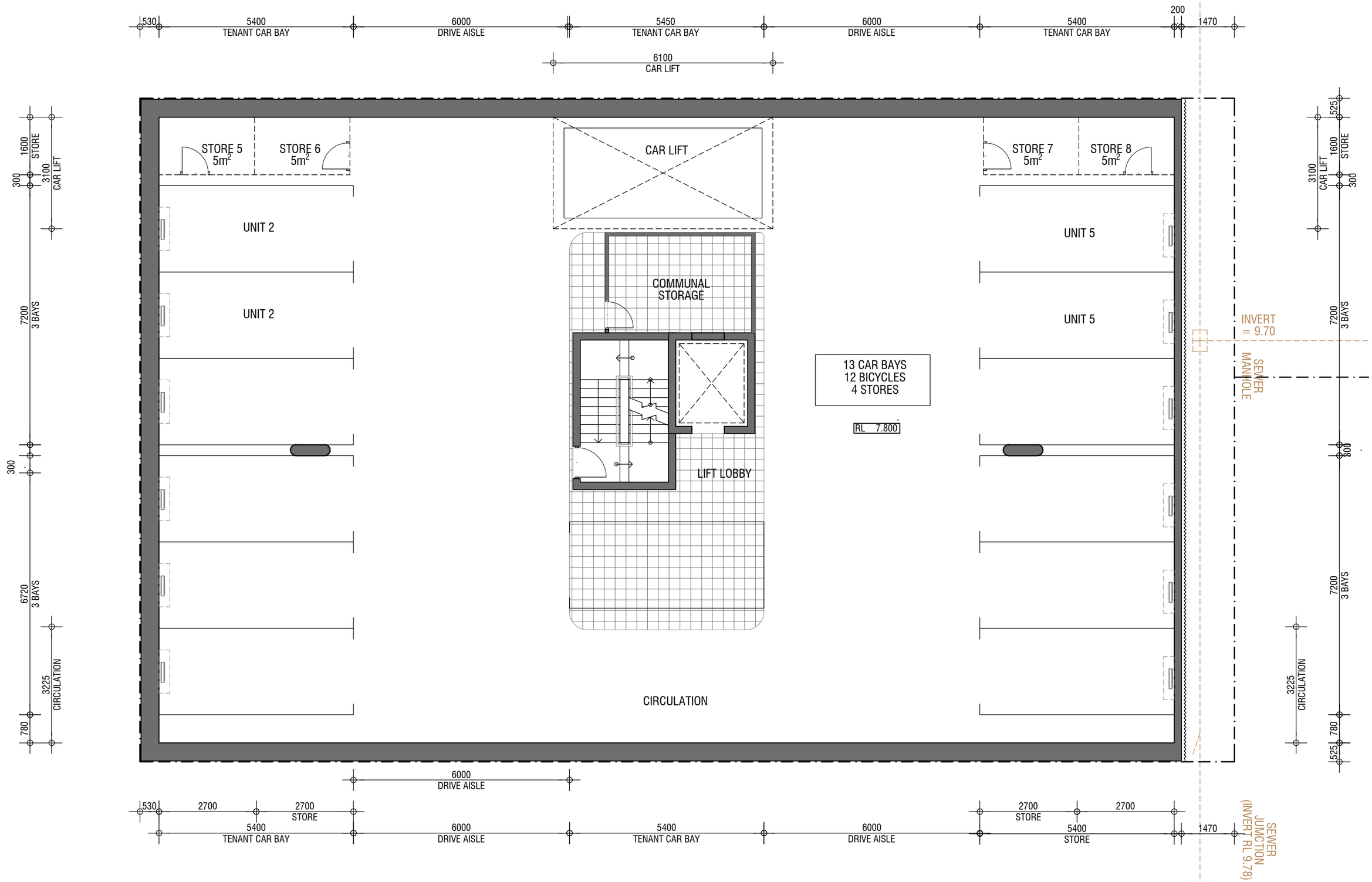

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DWG: BASEMENT 1 PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

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CADDSGROUP
ENERGY + SUSTAINABILITY

Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
- Anticon 60 (R1.3) + 195mm R4.0 Insulation batt
- Upgrade Glazing to Low-E, Neutral/Toned DGU in Aluminium Frame

Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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30400
3030 | 11130 | 3910 MAIL ROOM | 4000 LOBBY | 6500 VEHICLE LIFT | 2850 | 2250 | 9270 | 6000 CAR AISLE | 5550 CARBAYS | 3500 SETBACK | 1515

TOW 11.35
EX. HIGH BRICK PILLARED WALL
11.30
11.50
EXIST BRICK & METAL STORE
EX. MEDIUM BRICK WALL
11.42

BIN PRESENTATION AREA
VEHICLE LIFT
DRIVEWAY
BIKE BIKE BIKE BIKE BIKE BIKE BIKE BIKE
3400 CAR AISLE/LIFT
1900 BIKE STORAGE
2400
2400
2400
2400
2400
1080
300 18430

X-OVER (CONCRETE)
2890
CANOPY OVER
PEDESTRIAN ENTRY
RL 10.850
ENTRY LOBBY
RL 10.900
FIP
LIFT LOBBY
RL 10.800
COMMERCIAL BAY ELECTRIC
COMMERCIAL BAY ELECTRIC
LETTERBOXES/ MAILROOM
BOOSTER
CP EXIT
APART EXIT
CAFE (100m²)
RL 10.900
PARCEL STORE
REAR PARKING LOBBY
PARKLET (SUBJECT TO ENGAGEMENT OF COORDINATION WITH FORESHORE MASTERPLANNING)
EX. WATER MAINS
10.78
PEDESTAL PLINTH FOR INTEGRATION OF SCULPTURES BY THE SEA
6 CAR BAYS
8 BIKES BAYS
PUMP ROOM
FOOTPATH
EX. GV
BINS (8 X 1100LTR)
4540
SERVERY
UA
STORE
FITOUT BY OWNER
3900
NBN
COMMS
EX. ELEC PIT
EX. TELSTRA PITS
RL 11.170
TOW 11.65
TOW 11.65
11.50
TOW 11.65
DEEP SOIL AREA 30m²
ADDITIONAL PUBLIC BIKE BAYS
CAR PARKING BAY

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DWG: GROUND FLOOR PLAN
STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES
CLIENT: MARINE PARADE CLIENT GROUP
ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100
JOB#: 1902
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DWG: A1 05
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ENERGY + SUSTAINABILITY

Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
- Anticon 60 (R1.3) + 195mm R4.0 Insulation batt
- Upgrade Glazing to Low-E, Neutral/Toned DGU in Aluminium Frame

Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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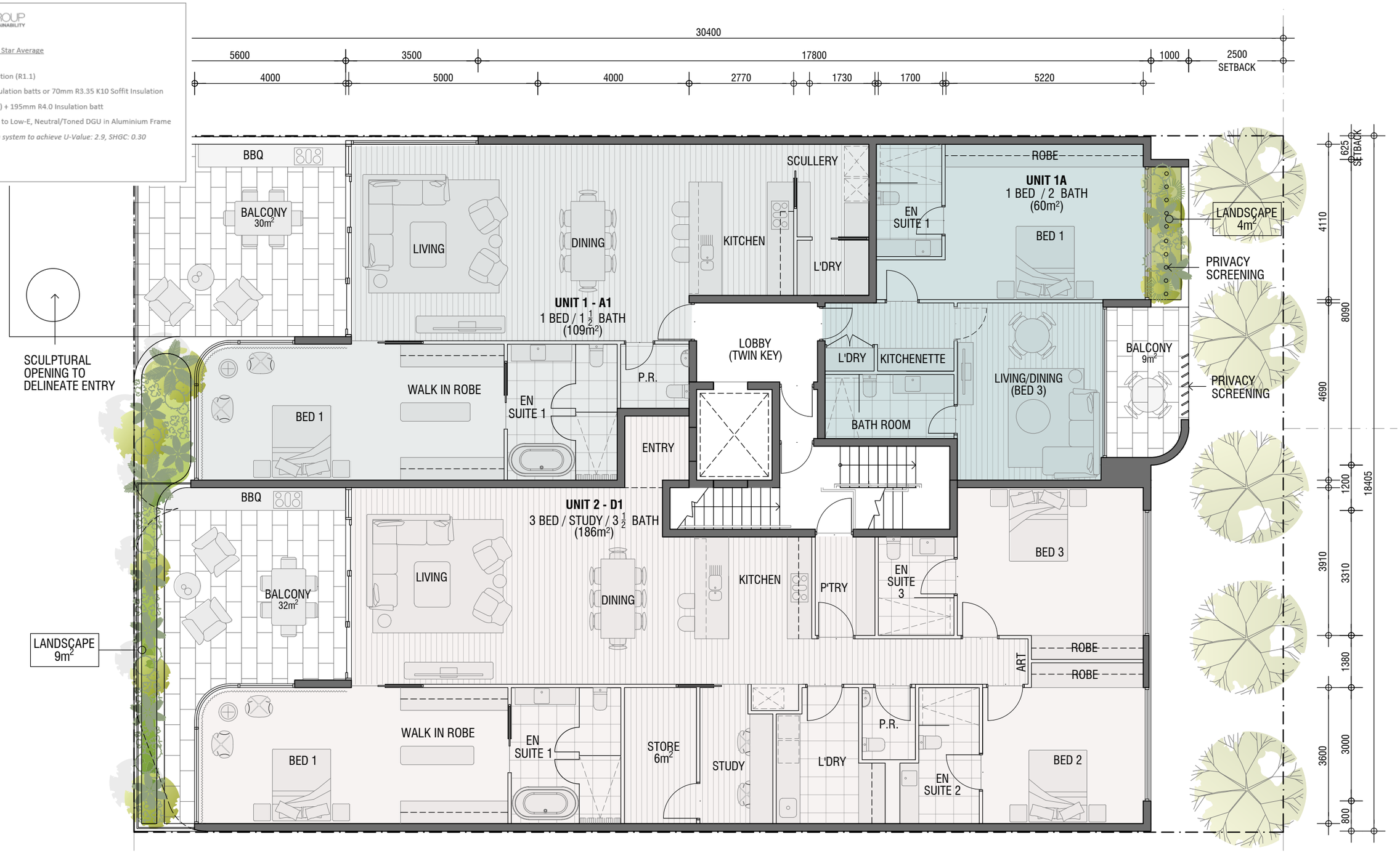

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DWG: FIRST FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

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Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
- Anticon 60 (R1.3) + 195mm R4.0 Insulation batt
- Upgrade Glazing to Low-E, Neutral/Toned DGU in Aluminium Frame

Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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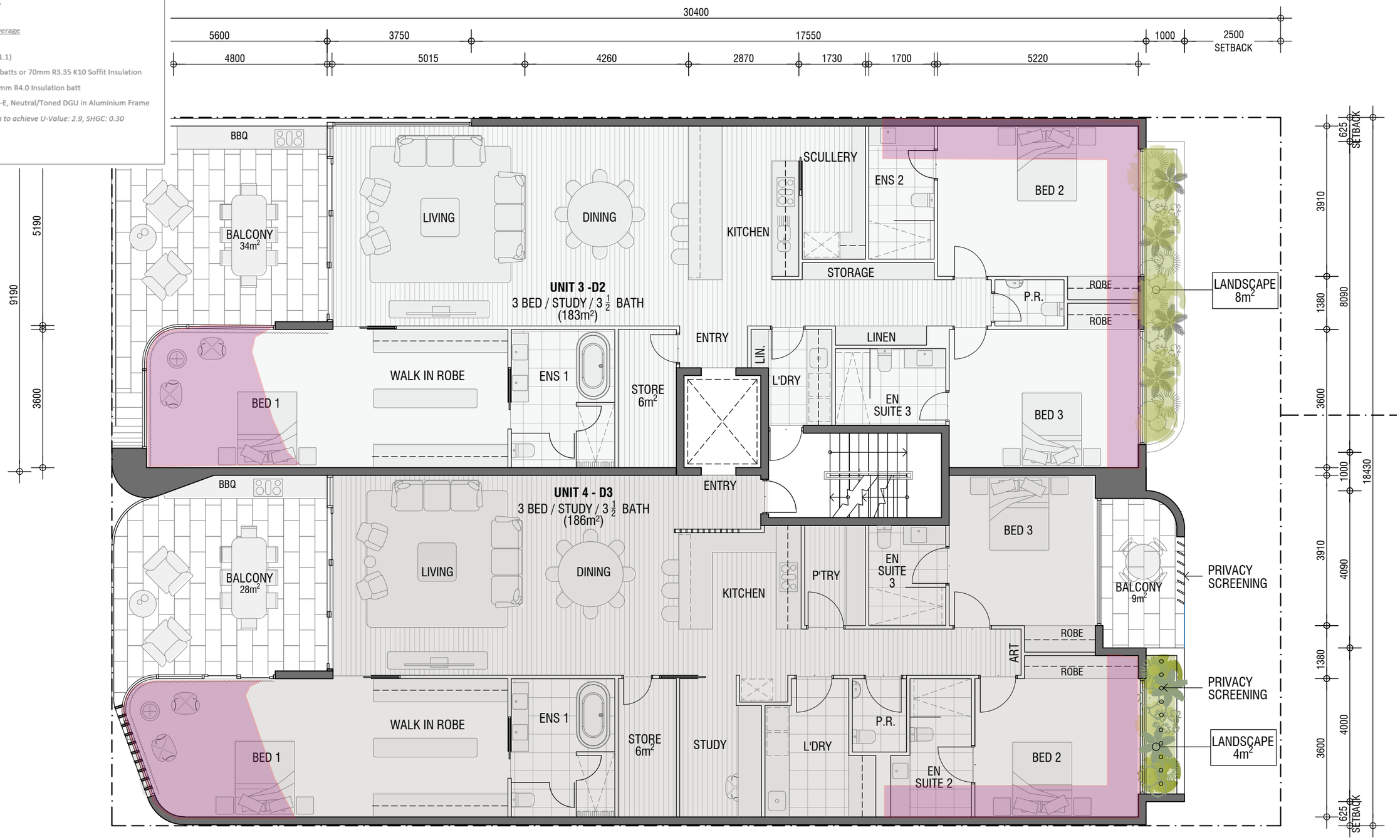

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DWG: SECOND FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

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DWG: A107

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ENERGY + SUSTAINABILITY

Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
- Anticon 60 (R1.3) + 195mm R4.0 Insulation batt
- Upgrade Glazing to Low-E, Neutral/Toned DGU in Aluminium Frame

Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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DWG: THIRD FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

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DWG: A1 08

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Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
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Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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KLOPPER & DAVIS ARCHITECTS

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DWG: FOURTH FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

NORTH

DWG: A1 09

ISSUE: AN

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ENERGY + SUSTAINABILITY

Recommendations for +1 Star Average

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- Upgrade Glazing to Low-E, Neutral/Toned DGU in Aluminium Frame

Total glazing system to achieve U-Value: 2.9, SHGC: 0.30

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AN	18-03-21	SDAU Issue		AK	02-03-21	DESIGN STUDY - 8 STOREY	
AM	11-03-21	CLIENT REVIEW - 8 STOREY		AJ	25-02-21	REVISED DEVELOPMENT APPLICATION	
AL	09-03-21	CLIENT REVIEW - 8 STOREY		AI	27-11-20	DEVELOPMENT APPLICATION	

KLOPPER & DAVIS ARCHITECTS

GENERAL NOTES:
1. CHECK ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF WORKS.
2. COORDINATE WORKS WITH ALL CONSULTANTS DRAWINGS.
3. DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.
4. REFER TO INTERIOR DRAWINGS FOR PLUMBING SETOUTS.
5. TILE UNDER ALL CABINETWORK U.O.N. DIMENSIONS ARE FROM FFL

DWG: FIFTH FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

NORTH

DWG: A110

ISSUE: AN

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CADDSGROUP
ENERGY + SUSTAINABILITY

Recommendations for +1 Star Average

- K10 Soffit Insulation (R1.1)
- 165mm R3.0 Insulation batts or 70mm R3.35 K10 Soffit Insulation
- Anticon 60 (R1.3) + 195mm R4.0 Insulation batt
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DWG: SIXTH FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

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DWG: A1 11

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DWG: SEVENTH FLOOR PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

JOB#: 1902

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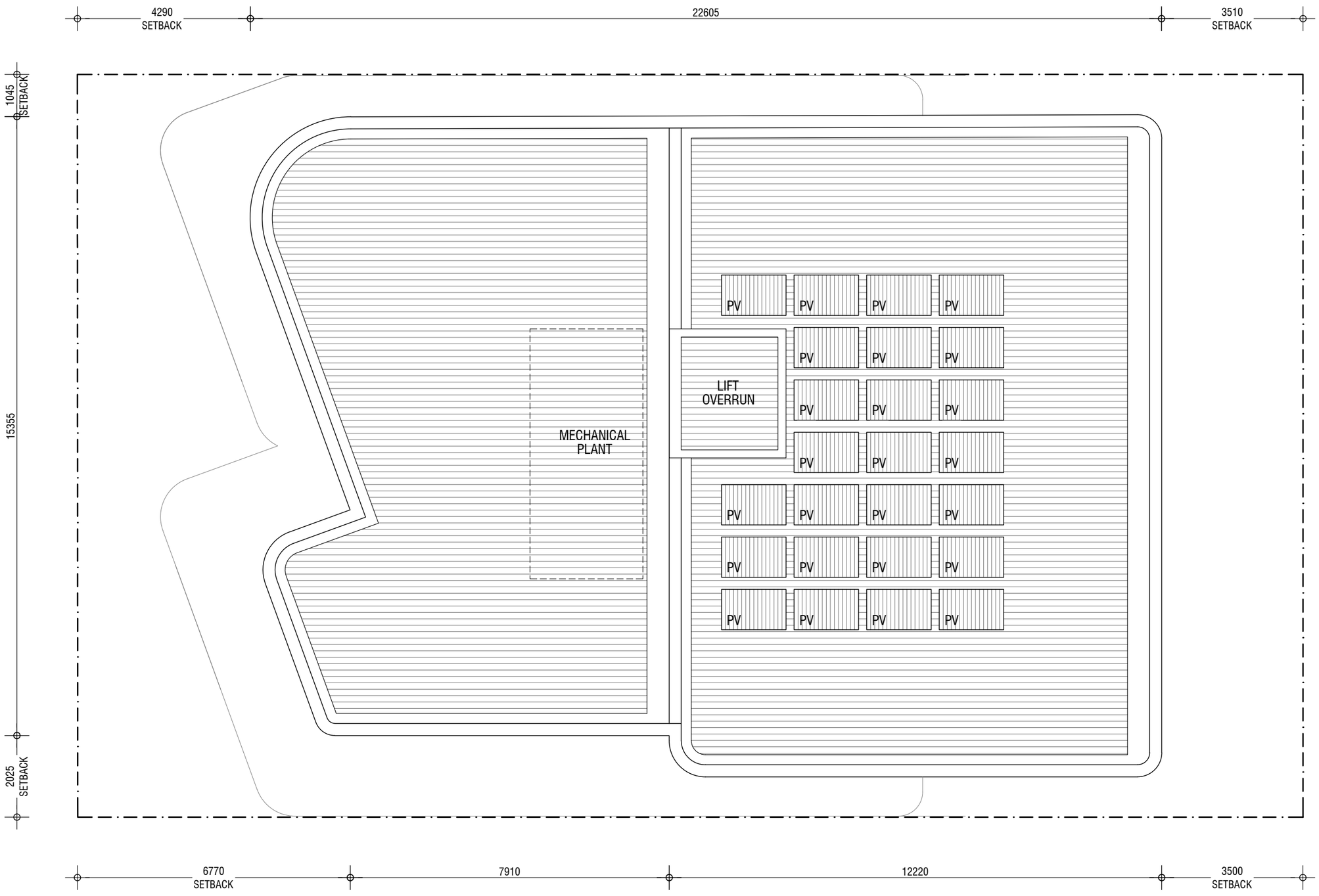

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DWG: ROOF PLAN

STAGE: DEVELOPMENT APPLICATION

PROJECT: MARINE PARADE RESIDENCES

CLIENT: MARINE PARADE CLIENT GROUP

ADDRESS: 120 MARINE PARADE, COTTESLOE

SCALE: 1:100

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