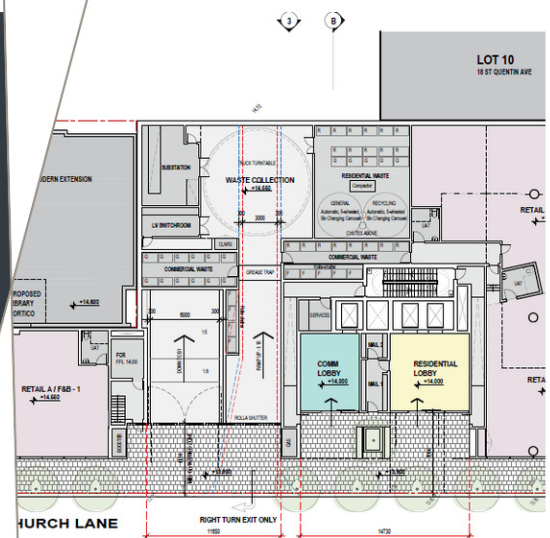


CW1146300

14 July 2021



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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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1 Introduction

Cardno has been commissioned by Synicast Pty Ltd (“the Client”) to prepare a Waste Management Plan (WMP) for the proposed mixed-use development (the Development) located at 22 Street Quentin Avenue, Claremont.

The scope of this WMP is limited to the estimation of general waste, and recycling volumes generated by the Development and includes recommendations for the appropriate collection, storage, handling and transportation of waste and recycling, in accordance with the requirements outlined by the Town of Claremont and the WALGA’s Multiple Dwelling, Commercial and Industrial Waste Management Plan Guidelines.

Estimations of generated volumes of liquid and bulk rubbish are not provided. Specialist contractors will need to be commissioned by the Development operators for the collection and disposal of liquid waste and bulk rubbish, as necessary.

1.1 Site Description

The proposed Development is located at 22 St. Quentin Avenue, Claremont as illustrated in **Figure 1-1**.

Figure 1-1 Site Location



Source: Nearmap (2021)

Plans for the proposed development outlines a sixteen-storey mixed use building with residential apartment and commercial tenancies. The anticipated usages generating waste from the proposed Development is tabulated in **Table 1-1**.

The proposed Development will front onto Church Lane on the eastern side and is surrounded by other mixed-use properties. The bin enclosure for the development is proposed to be located on the ground floor of the proposed site and is accessible from Church Lane.

Architectural plans outlining the usage of floor space are provided in **Appendix A**.

Table 1-1 Proposed Development

Type of Premises	Quantity
1-bedroom	20 dwellings
2-bedroom	39 dwellings
3-bedroom	27 dwellings
Food & Beverage (Restaurant)	507 sqm
Commercial	1216 sqm

1.2 Waste and Recycling Collection Services

The proposed development will use the waste collection service provided by the Town of Claremont for the collection of general and recycling waste for the proposed residential apartments, while a private contractor will provide the service for the collection of general and recycling waste for the commercial and food and beverage tenancies.

General and recycling waste collections will be undertaken on-site and arranged to occur during off-peak hours to minimise disruption to traffic operations as well as minimise any impacts to residents and tenants.

1.3 Refuse Storage Room

The Mobile Garbage Bin (MGB) storage for the Development will be in separate refuse rooms located on the ground floor.

1.3.1 Construction Considerations

The refuse rooms for the Development will be designed with the following considerations:

- Floors to be even and flat for safe storage of bins;
- Access doors will be self-closing to prevent access to vermin;
- Doors to bin storage area should be wide enough for bins to fit through;
- Adequate aisle width for easy manoeuvring of bins;
- No double stacking of rows of bins;
- All wall joins will be sealed to a height of 150 mm for ease of washing;
- Walls are to be painted with washable paint;
- Washing facilities with hot and cold taps located at a minimum height of 1.5 m (and no higher than 1.7 m) for washing of bins, equipment and refuse room floors;
- Drainage of waste water from washing facilities will drain to main sewers;
- All electrical outlets will be installed at a height of 1.6 m for ease of use and safety;
- Light switches for the refuse rooms must be installed at a height of 1.6 m to prevent obstruction by bins and equipment;
- Sufficient lighting of the refuse rooms should be provided by motion detected automatic artificial lighting in order to facilitate access to the refuse rooms;
- Adequate ventilation will be provided to the refuse rooms to ensure sufficient turnover of the air mass to prevent odour nuisance;
- Appropriate signage to be provided;
- To be designed to not permit stormwater to enter into the drain;
- Bins not to be visible from the property boundary or areas trafficable by the public; and
- Bins are reasonably secured from theft and vandalism.

2 Waste Generation and Management

In order to ensure that the waste from the development is properly managed, it was necessary to estimate the volume of waste that is likely to be generated on the premises. The Town of Claremont has advised that a waste management plan for a two-bin collection system i.e. general waste and recyclables is required. The Town of Claremont provided the methodology for calculating the bin requirements for residential apartments while the estimation of waste for the commercial and food and beverage tenancies were based on the waste generation rates outlined in WALGA.

Using these general and recycling waste rates, a broad estimation of daily waste generation for the development has been calculated.

2.1 General Waste and Recycling Streams

Waste and recyclables will be sorted on-site and as close to source as possible. Sorting will rely on appropriate education of residents, tenants and staff in addition to adequate signage for bins located in the refuse rooms. Waste and recycling will be based on the following streams:

- > General Waste.
- > Co-mingled Recycling, which includes clean aluminium foil and trays, glass bottles and jars, long-life milk and juice cartons, cardboard, plastic containers, tins and cans.

2.1.1 Other Streams

Storage, handling and collection of liquid wastes are not covered in this WMP. The Development operator will need to source and enter into an agreement with an appropriate registered and accredited waste collection contractor for these wastes.

Storage, handling and collection of bulk wastes, such as mattresses and other hard rubbish and electronic waste such as old batteries are not covered in this WMP.

It should be noted that the Town of Claremont provides biannual verge collection services for bulk waste and green waste. It is recommended that the Strata/Facility Manager/caretaker of this development manage and coordinate the collection of bulk waste for this development.

2.2 Waste and Recycling Estimate

The waste generation of the residential component of the development was calculated based on the requirements of the Town of Claremont. The Town of Claremont requires that sufficient bins are provided for multi-residential apartment developments.

For the commercial and food and beverage tenancies, bin requirements have been calculated using the waste generation rates outlined in WALGA's Commercial and Industrial Waste Management Plan Guidelines (see **Table 2-1**).

Table 2-1 Town of Claremont Waste Generation Requirement

Waste Streams	Dwellings	Waste Generation Requirement	Weekly Volume Generated
General Wastes	86	86 dwellings x 120 Litre Capacity per weekly	10320 L
Recycling Wastes	86	86 dwellings x 240 Litre Capacity per fortnightly	20640 L

A summary of the estimated waste generation rates for each waste stream is provided in **Table 2-2**. Waste estimates were obtained by way of calculations outlined in **Appendix B**.

Table 2-2 Weekly Waste Generation Rates for the Development (Commercial)

Type of Premises	Quantity	General Waste (L)	Co-mingled Recycling (L)
Food & Beverage (Restaurants)	507 sqm	660L/100m ² /day	130L/100m ² /day
Office	1216 sqm	10L/100m ² /day	10L/100m ² /day

The waste volumes presented are estimates only and are representative of the design drawings of the Development provided in July 2021.

2.2.2 Bin Requirement

A breakdown of the anticipated MGB requirements for the residential component and associated storage area minimum requirements is provided in **Table 2-3**. Please note the estimates are indicative of the area required for the storage of bins exclusively and does not allow for the movement of bins or access to the bin enclosure.

Table 2-3 Bin Requirements for Enclosure of Proposed Site (Residential)

Waste Streams	Volume Generated per week	Proposed Collection per week	Proposed Bin Size	Number of Bins	Required Area (m ²)
General Wastes	10320 L	Twice weekly	660L	8	9.3
Recycling	10320 L	Twice weekly	660L	8	9.3
Total				16	18.6

A breakdown of the anticipated MGB requirements for the commercial tenancies and associated storage area minimum requirements are provided in **Table 2-4**. The bin calculations are based on the general and recycling waste for an office and food and beverage type development.

Please note the estimates are indicative of the area required for the storage of bins exclusively and does not allow for the movement of bins or access to the bin enclosure. Bin sizes used are as recommended by the City.

Table 2-4 Bin Requirements for Enclosure of Proposed Site (Commercial)

Commercial				
Floor Item	Depth (mm)	Width (mm)	Quantity	Area Required (m ²)
Food & Beverage (Restaurant)				
660 L MGBs for Wastes*	850	1370	19	20.96
660 L Co-mingled Recycling Bins	850	1370	4	4.66
Total Area Required				25.62
No of Bins for Restaurant				22
Office				
660 L MGBs for Wastes*	850	1370	1	1.16
660 L Co-mingled Recycling Bins	850	1370	1	1.16
Total Area Required				2.33
No of Bins for Commercial				2

A layout of the anticipated bin enclosure is illustrated in **Figure 2-1**.

Architectural floor plan showing waste management areas and surrounding facilities. Key features include:

- Residential Bin Store** (Orange box): 14 GENERAL WASTE BINS, 10 RECYCLE BINS. Includes a "WASTE COLLECTION" area with dimensions 300 x 3000 x 300.
- Commercial Bin Store** (Green box): 10 GENERAL WASTE BINS, 5 RECYCLE BINS. Includes a "WASTE TRAP" and "GAS SHUTTER".
- Waste Collection** (Yellow box): 14 GENERAL WASTE BINS, 10 RECYCLE BINS. Includes "Automatic, 6-wheelers Bin Changing Concept" and "CHUTES ABOVE".
- Proposed Library Portico** (Grey box): Located on the left side of the plan.
- Retail A / F&B - 1** (+14.550): Located at the bottom left.
- Retail B / F&B - 2** (+14.550): Located at the top right.
- Retail C / F&B - 3** (+14.200): Located at the bottom right.
- Commercial Lobby** (+14.000) and **Residential Lobby** (+14.000): Located in the center-right.
- Services** and **Mail** areas (Mail 1, Mail 2) are also shown.
- Hydraulic Services** in-built for future tenancy specific bathroom and/or kitchen facilities are indicated in several areas.

2.3 Bin Enclosure Layout

2.4 Design Consideration

2.4.1 Odour

2.4.2 Noise

2.4.3 Vermin

2.4.4 Washing of Bins and Enclosure

2.4.5 Aesthetics

5

2.4.6 Protection from Vandalism

The bin enclosure will be closed off from public access and will use gates and/or doors to promote a sense of ownership and community in order to deter vandalism and anti-social behaviour. No bins will remain or be stored outside of the enclosure

2.5 Transfer of Waste and Recycling

2.5.1.1 Residential Tenants Waste and Recycling Transfer

Residents will transfer their general and recycling waste to the dedicated chutes located within the development as required. These wastes will be disposed from the relevant chutes to the specific bins within the associated bin stores.

2.5.1.2 Commercial Tenants Waste and Recycling Transfer

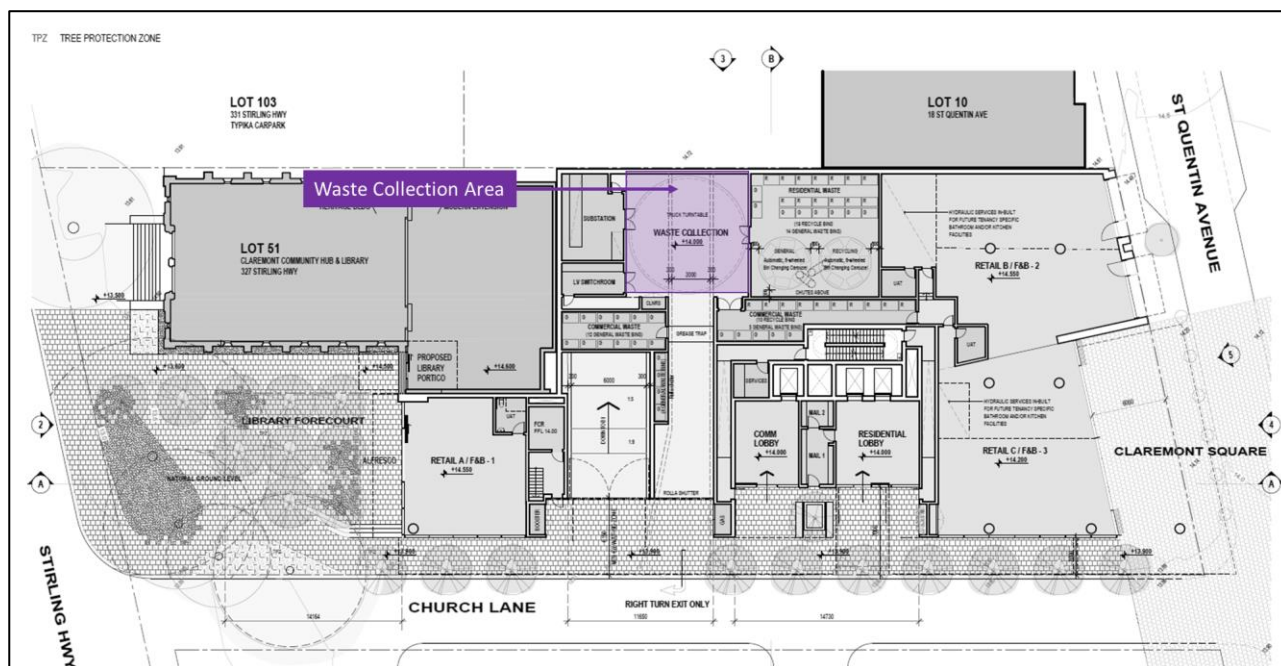
Tenants and staff will transfer waste to the dedicated refuse stores located on the ground floor as required. These wastes will be emptied into their respective bins within the associated bin stores.

2.6 Collection of Waste and Recycling

The City will service the residential development by providing for 8x660L bins for general waste and 8x660L bins for recycling waste. A private contractor will service the commercial and food and beverage tenancies of the development by providing 20x660L bins for general waste and 5x660L bins for recycling waste.

Waste collection is proposed to be undertaken on-site at the dedicated collection area illustrated in **Figure 2-2**.

Figure 2-2 Dedicated collection area



Source: Pennock Architect

The Strata/ Facility Manager or staff will provide access to the proposed bin enclosures. The Town of Claremont / private contractor staff will ferry loaded MGBs from the respective bin enclosures to the waste truck for disposal on the days of collection and return the empty MGBs back to the respective bin enclosures.

2.6.2 Waste Collection Frequencies

It is anticipated that the residential and commercial waste collection frequencies will be as follows:

- > General waste and recyclables for the residential apartments is to be collected twice a week by the Town of Claremont; and

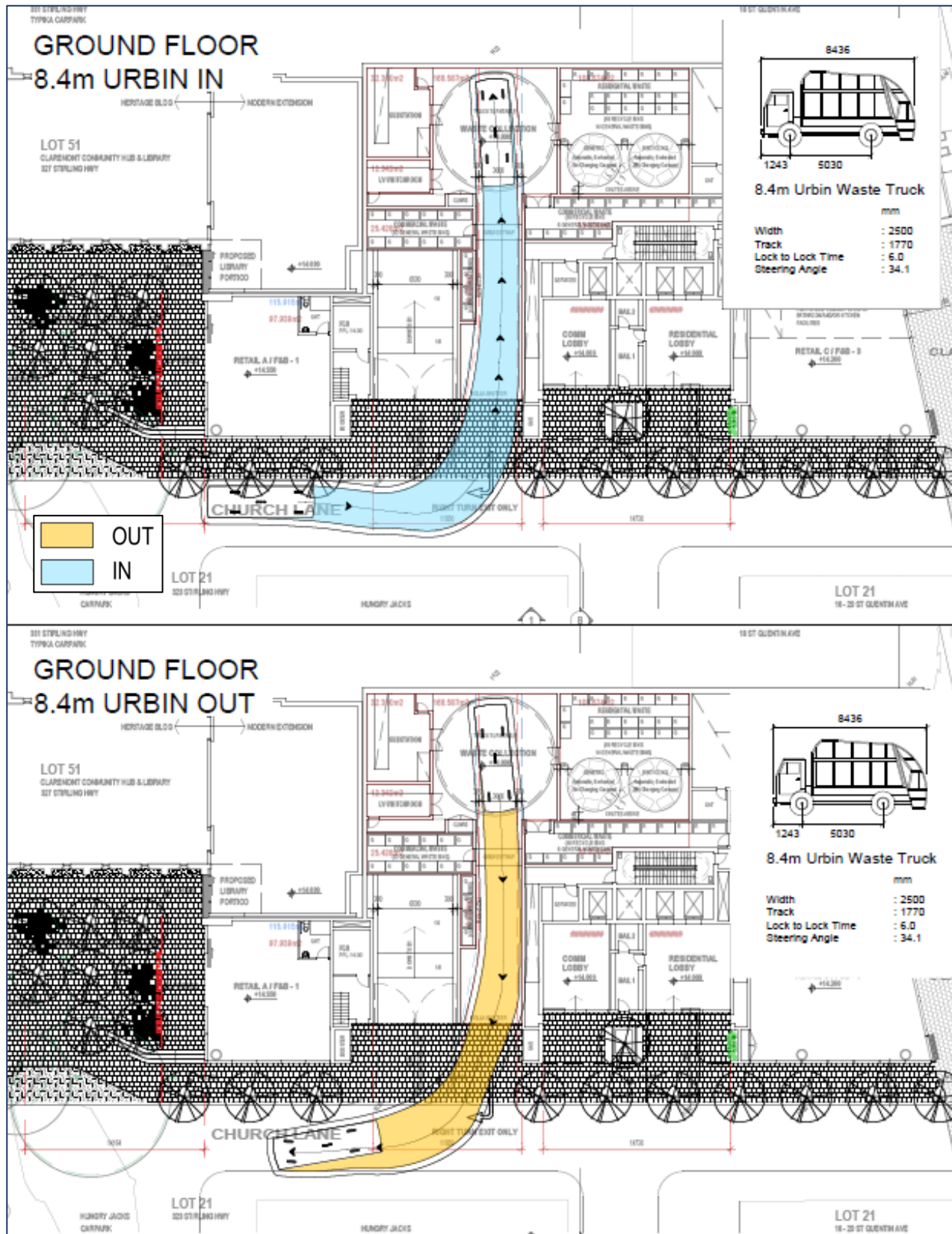
- > General waste and recyclables for the food and beverage and commercial tenancies is to be collected twice a week by a private contractor.

2.6.3 Provision for Service Vehicles

The waste vehicle is proposed to enter and exit the site via Church Lane from/to Stirling Highway. A truck turntable is proposed internally in order for a waste vehicle to enter and exit the subject site in a forward direction. It should be noted that waste collection should be arranged to be collected during off-peak periods in order to minimise the impact on residents and tenants.

The swept path analysis was undertaken for an 8.4m Urbin waste truck as illustrated in **Figure 2-3**. The analysis shows that the waste vehicle will be able to safely enter and exit the subject site in forward gear.

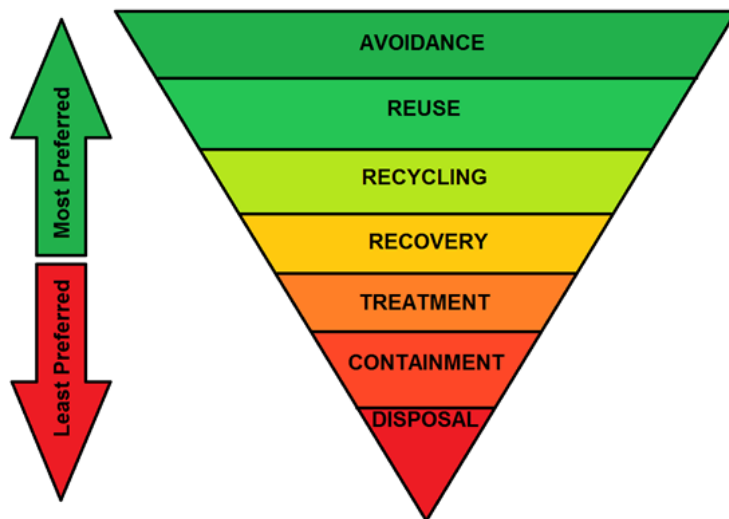
Figure 2-3 Waste Truck Swept Path



3 Waste Reduction and Management Strategy

This waste management plan has been developed with the strategic approach of reducing waste through best practices and education of residents, tenants and staff. Best practices for waste minimisation will optimise the Development's use of the waste minimisation hierarchy, which seeks to encourage sustainable options for waste. The waste hierarchy is demonstrated below.

Figure 3-1 Waste Hierarchy



3.1 Provision of Information

Information dissemination is essential in order to communicate well the best practices of waste management. Suitable types of information which can be provided includes:

- Online information;
- Marketing materials such as posters and leaflets demonstrating procedures of waste segregation and waste collection days; and
- Sufficient labelling of bins, signage of storage areas and equipment to reinforce waste separation.

However, information on its own is not enough and it must be paired with initiatives to be effective.

3.2 Engagement

A regular engagement between all the stakeholders of the development should take place in order to remind the tenants and staff the proper and best practices of waste management. The engagement should include

- Demonstration of waste management systems pertinent to an individual's role;
- Distribution of waste management strategy documents in relevant locations;
- An explanation of the benefits of waste separation and recycling; and
- Training on all pertinent equipment related to waste management;

3.3 Monitoring and Review

The Strata/Facility Manager who will oversee the implementation of the Waste Management Plan, should continually monitor and review the waste management plan activities.

The Strata/Facility Manager will be responsible for the following:

- Monitoring and maintenance of bins and the Bin Storage Area;

- Monitor bulk wastes accumulation and communicate with the Town of Claremont for bulk waste collection services;
- Assist with ferrying of bins to and from the Bin Storage area and Bin Presentation Area on collection days;
- Monitor resident's and tenant's behaviour and identify requirements for further waste segregation and management education; and
- Engage with the local government to ensure efficient and effective waste service to the development.

In the event that waste generation rates for the Development change, a waste audit may be required by the City or other regulatory bodies. Similarly, should a change to the waste regulations be implemented by the City or other regulatory bodies, a waste audit may be required in addition to further waste stream separation.

4 Conclusion

This Waste Management Plan demonstrates that the proposed development provides a sufficiently sized Bin Storage Area for storage of general and recyclable waste based on the estimated waste generation and a suitable configuration of bins.

The collection of general and recyclable waste is achieved using:

- > 8x660L general waste for residential, collection twice weekly;
- > 8x660L recycling for residential, collection twice weekly;
- > 19x660L general waste for food & beverage (restaurant), collection twice weekly;
- > 4x660L recycling for food & beverage (restaurant), collection twice weekly;
- > 1x660L general for commercial office, collection twice weekly; and
- > 1x660L recycling for commercial office, collection twice weekly; and

The waste collection vehicle is anticipated to collect the general and recycling bins on site. The Strata/Facility Manager or staff will provide access to the proposed bin enclosures. The Town of Claremont and private contractor staff will ferry loaded MGBs from the bin enclosures to the waste truck for disposal on the days of collection and return the empty MGBs back to the respective bin enclosures.

5 References

WALGA (n.d.), Multiple Dwelling Waste Management Guidelines, Perth.

22 Street Quentin Avenue, Claremont

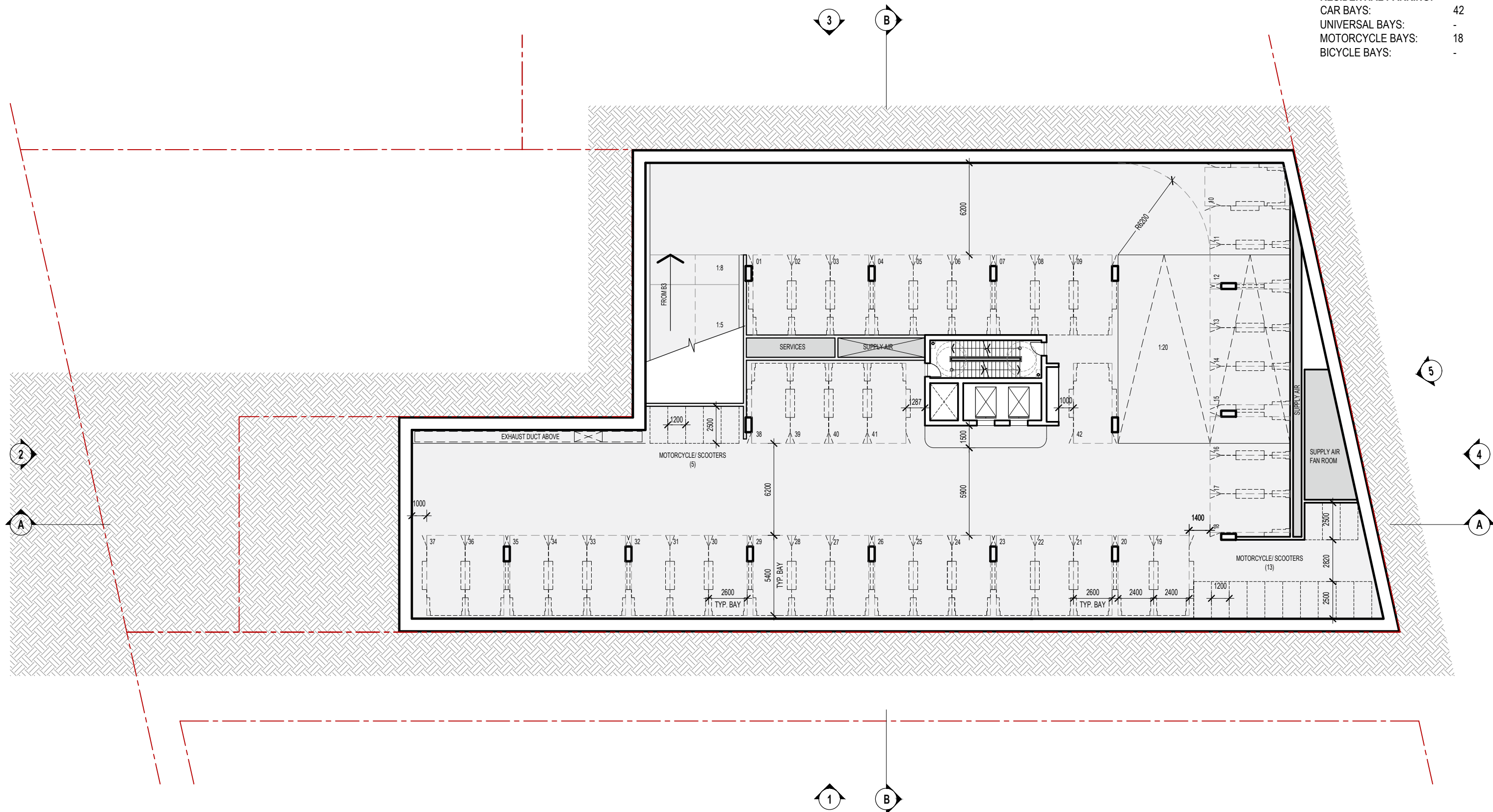
APPENDIX

A

ARCHITECTURAL PLANS

RESIDENTIAL PARKING:

CAR BAYS:	42
UNIVERSAL BAYS:	-
MOTORCYCLE BAYS:	18
BICYCLE BAYS:	-



GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

LEGEND

SERVICES / FACILITIES	VEHICULAR CIRCULATION	RETAIL / F & B	RESIDENT COMMUNAL	COMMERCIAL	1 BED + 1 BATH
2 BED + 2 BATH	3 BED + 2 BATH	PENTHOUSE	BALCONY / STORE	LANDSCAPE	POOL

PENNOCK
ARCHITECTS

PROJECT

CLAREMONT MIXED-USE DEVELOPMENT
22 ST QUENTIN AVENUE, CLAREMONT, WA

TITLE

BASEMENT 4
FLOOR PLAN

STATUS

DEVELOPMENT APPLICATION

SHEET

DA 2001

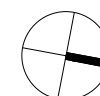
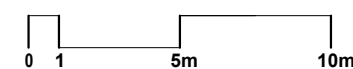
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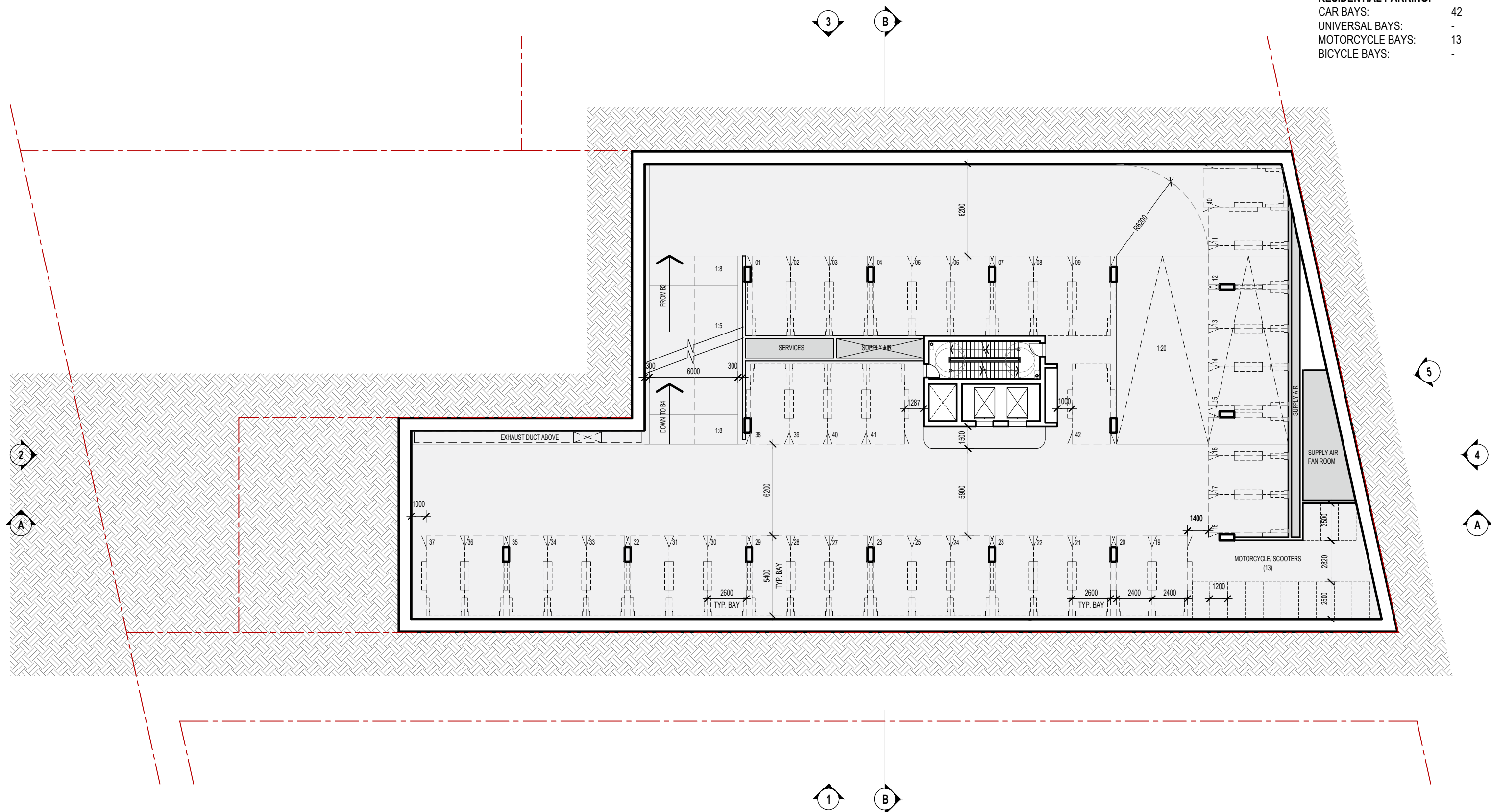
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RESIDENTIAL PARKING:

CAR BAYS:	42
UNIVERSAL BAYS:	-
MOTORCYCLE BAYS:	13
BICYCLE BAYS:	-



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LEGEND

SERVICES / FACILITIES	VEHICULAR CIRCULATION	RETAIL / F & B	RESIDENT COMMUNAL	COMMERCIAL	1 BED + 1 BATH
2 BED + 2 BATH	3 BED + 2 BATH	PENTHOUSE	BALCONY / STORE	LANDSCAPE	POOL

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ARCHITECTS

PROJECT

CLAREMONT MIXED-USE DEVELOPMENT
22 ST QUENTIN AVENUE, CLAREMONT, WA

TITLE

BASEMENT 3
FLOOR PLAN

STATUS

DEVELOPMENT APPLICATION

SHEET

DA 2002

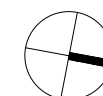
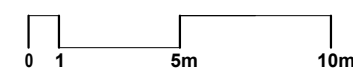
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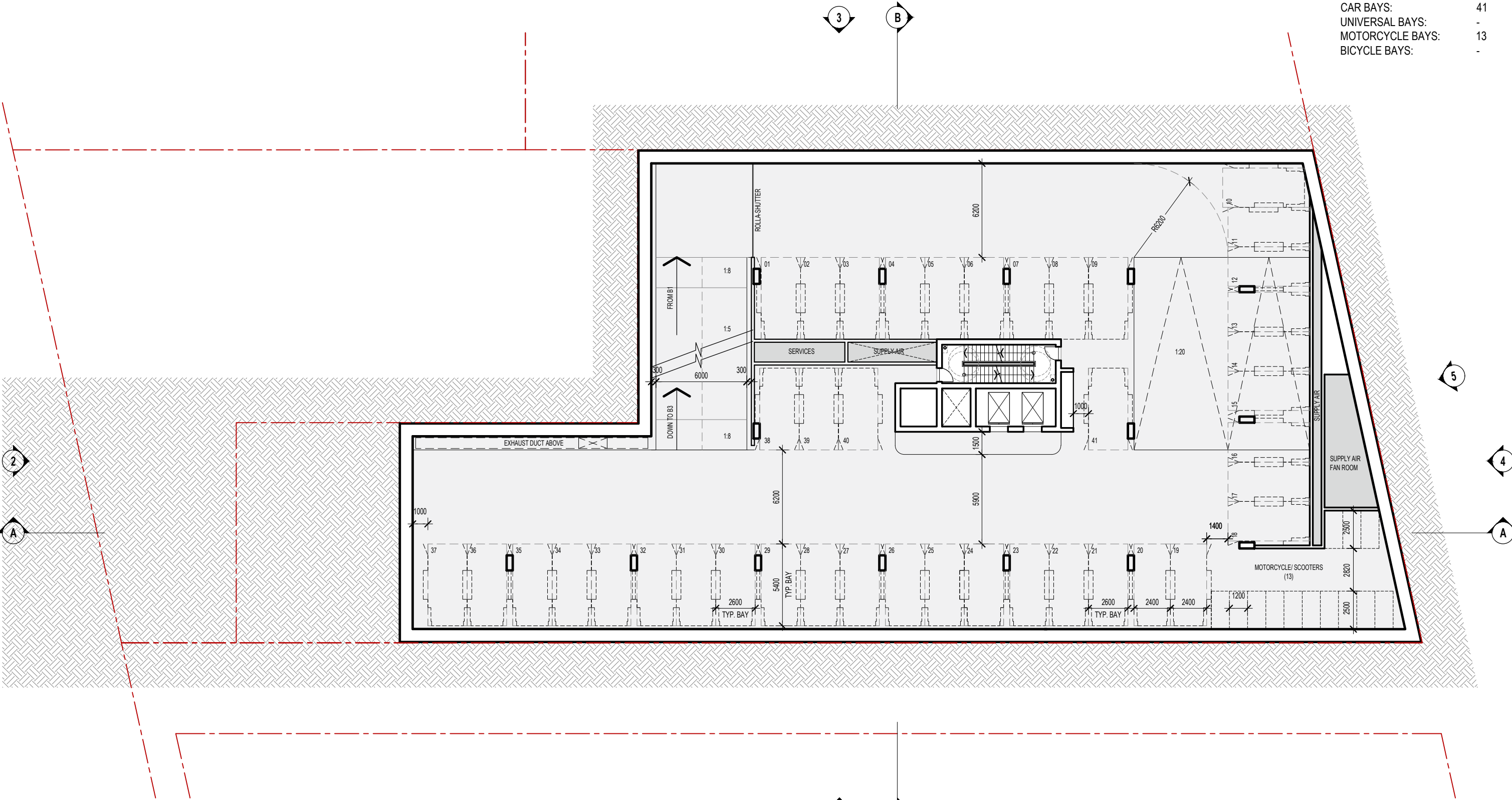
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09-07-21

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RESIDENTIAL PARKING:
CAR BAYS: 41
UNIVERSAL BAYS: -
MOTORCYCLE BAYS: 13
BICYCLE BAYS: -

- GENERAL NOTES**
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 - ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
 - DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

LEGEND					
SERVICES / FACILITIES	VEHICULAR CIRCULATION	RETAIL / F & B	RESIDENT COMMUNAL	COMMERCIAL	1 BED + 1 BATH
2 BED + 2 BATH	3 BED + 2 BATH	PENTHOUSE	BALCONY / STORE	LANDSCAPE	POOL

PENNOCK
ARCHITECTS

PROJECT
CLAREMONT MIXED-USE DEVELOPMENT
22 ST QUENTIN AVENUE, CLAREMONT, WA

TITLE
BASEMENT 2
FLOOR PLAN

STATUS
DEVELOPMENT APPLICATION

SHEET
DA_2003

REV. C
DATE 09-07-21

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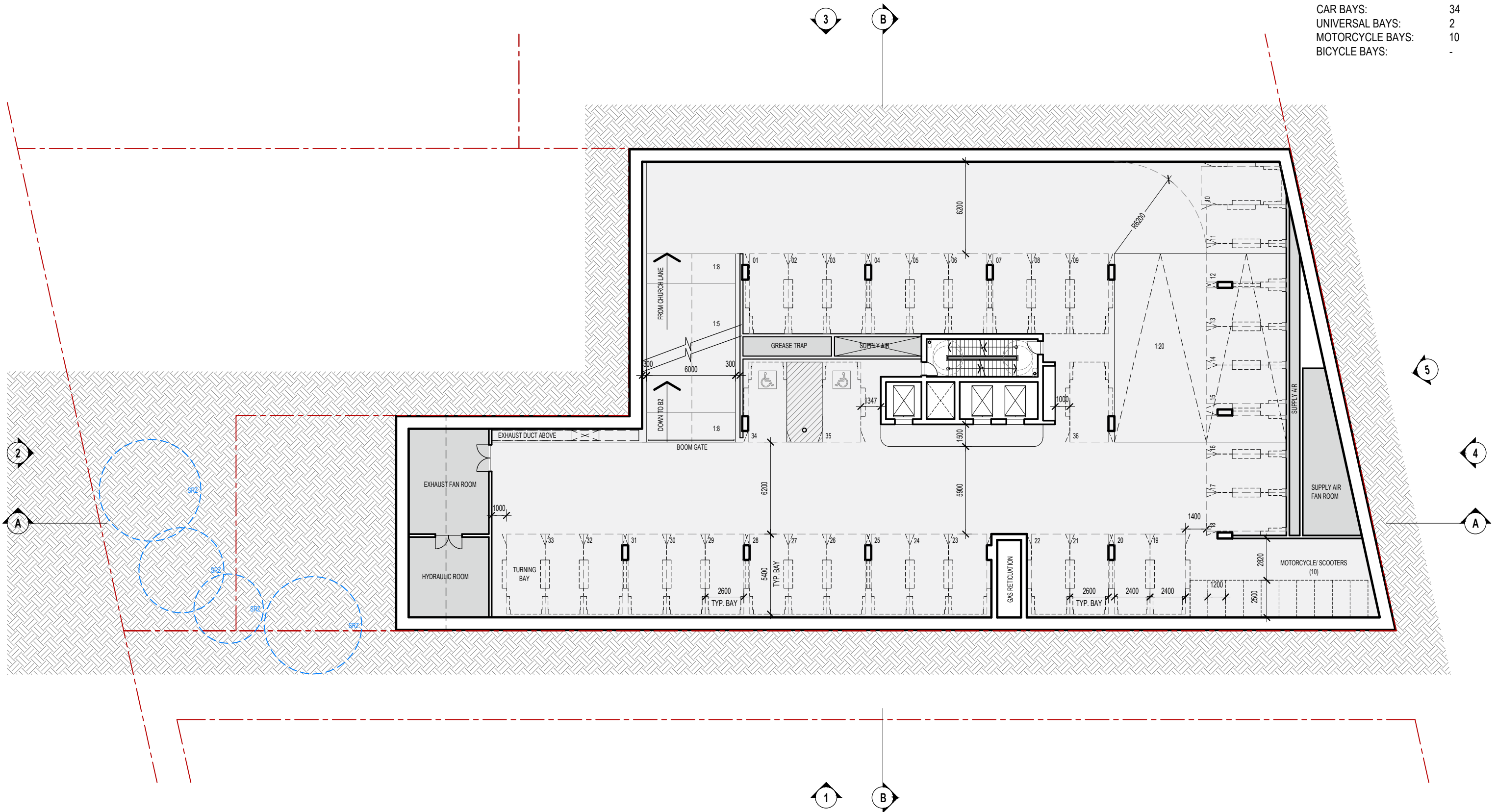


COMMERCIAL / RETAIL PARKING:

CAR BAYS: 34

UNIVERSAL BAYS: 2

MOTORCYCLE BAYS: 10
BICYCLE BAYS: -



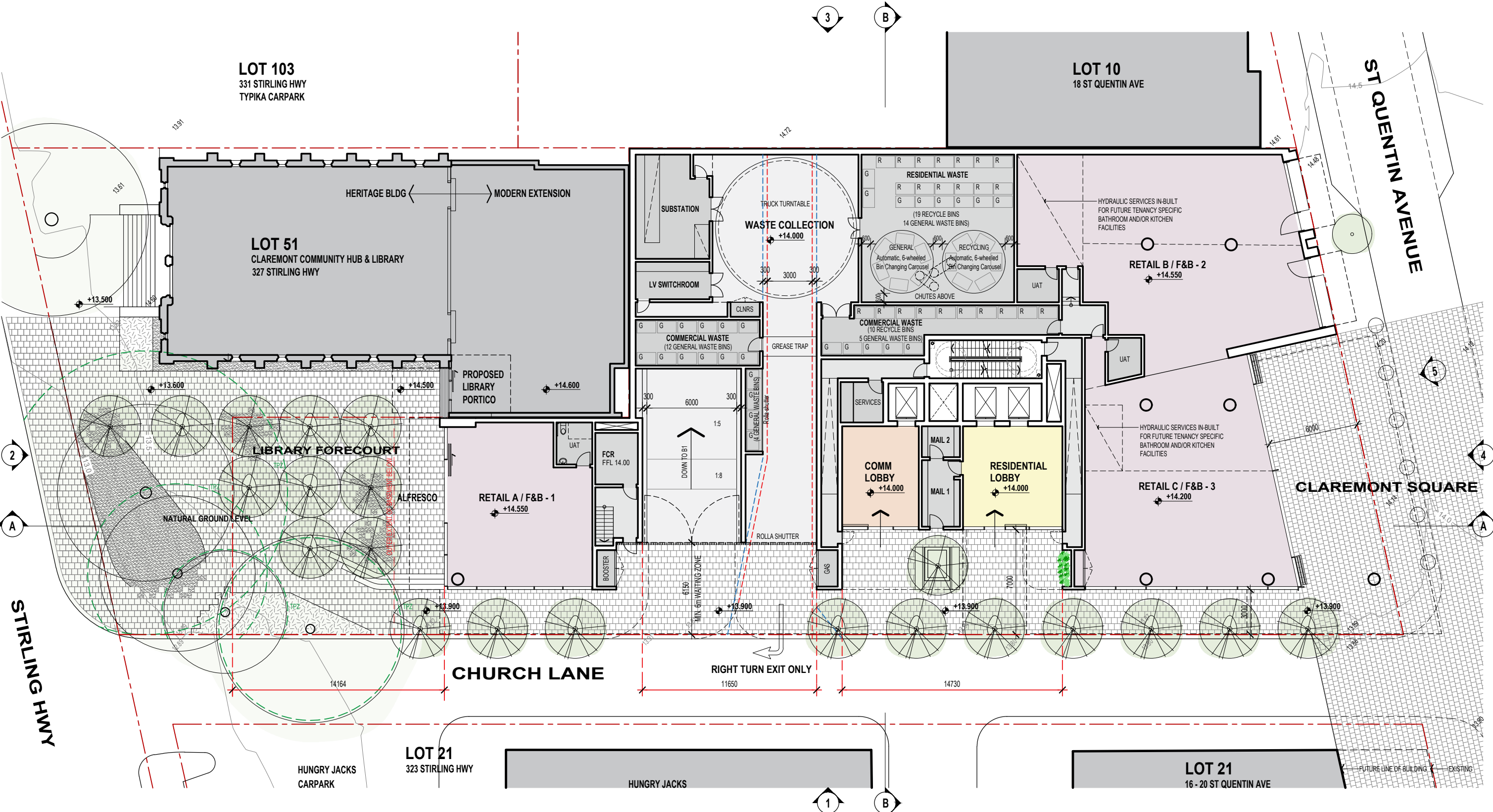
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SERVICES / FACILITIES	VEHICULAR CIRCULATION	RETAIL / F & B	RESIDENT COMMUNAL	COMMERCIAL	1 BED + 1 BATH
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SERVICES / FACILITIES	VEHICULAR CIRCULATION	RETAIL / F & B	RESIDENT COMMUNAL	COMMERCIAL	1 BED + 1 BATH
2 BED + 2 BATH	3 BED + 2 BATH	PENTHOUSE	BALCONY / STORE	LANDSCAPE	POOL



22 Street Quentin Avenue, Claremont

APPENDIX

B

WASTE CALCULATIONS

Town of Claremont's Waste Estimation Based on Standard Service

The following equation was used to estimate the volume of waste generated of residential apartments for General Waste based on a weekly collection

$$\text{Total Weekly Waste Generated} = \text{Number of Dwellings} \times 120L$$

The following equation was used to estimate the volume of waste generated of residential apartments for Recycling Waste based on a fortnightly collection

$$\text{Total Weekly Recycling Waste Generated} = \text{Number of Dwellings} \times 240L \div 2$$

Waste Streams	Dwellings	Weekly Volume Generated
General Wastes	86	10320 L
Recycling Wastes	86	10320 L

The total number of bins required for collection of general waste, and co-mingled recycling, with a twice a week collection frequency was calculated using the following equation:

$$\text{Total Number of Bins Required} = \frac{\text{Total Weekly Waste Generated}}{660 L} \times \frac{1}{2}$$

Waste generation rate as per WALGA's Commercial Waste Generation Rates

General Waste and Recycling Generation Rates

Type of Premises	General Waste (L)	Co-mingled Recycling (L)
Food & Beverage (Restaurant)	660 L/100sqm/day	200 L/100sqm/day
Office	10 L/100sqm/day	10 L/100sqm/day

The following equation was used to calculate the anticipated weekly waste generation for commercial waste for the proposed development:

$$\text{Total Weekly Waste Generated (Floor Area} \times \text{Waste Rate)} \times \text{no of days per week}$$

The total number of bins required for the collection of general waste twice a week for the proposed office and food & beverage (restaurant) tenancies was calculated using the following equation:

$$\text{Total Number of General Bins Required} = \frac{\text{Total Weekly Waste Generated}}{660 L} \times \frac{1}{2}$$

The total number of bins required for collection of recycling waste twice a week for the proposed office and food & beverage (restaurant) tenancies was calculated using the following equation:

$$\text{Total Number of Recycling Bins Required} = \frac{\text{Total Weekly Waste Generated}}{660 L} \times \frac{1}{2}$$