TRAFFIC IMPACT ASSESSMENT

Oran Park Leisure Centre
Oran Park Civic Precinct

Reference: 17.224r04v05
Date: October 2021

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DOCUMENT VERIFICATION

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Client	Camden Council			
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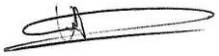
v05	01/10/2021	Neil Caga	Vince Doan	

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1. INTRODUCTION

TRAFFIX has been commissioned by Camden Council to undertake a traffic impact assessment (TIA) in support of a development application (DA) relating to the Oran Park Leisure Centre located within the Oran Park Civic Precinct. The development is located within the within the Camden Council Local Government Area and forms part of the Oran Park Precinct and in particular, the Oran Park Civic Precinct. Accordingly, it is subject to the controls outlined within Camden Council's Development Control Plan (DCP) 2019 and Oran Park Precinct DCP 2007 – Part B1.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site forms part of the Oran Park Civic Precinct and is located approximately 45 kilometres southwest of Sydney CBD and is legally identified to be within the northern section of Lot 5 in DP270899. More specifically, it is situated on the northwest corner of the Civic Way and Holstein Street intersection, approximately 300 metres north of Peter Brock Drive.

The leisure centre component of the site is irregular in configuration and has a total site area of 11,058m^2. It has a northern and eastern frontage to vacant land (proposed future unnamed roads), measuring 128 and 80 metres, respectively. The remaining western frontage to Central Avenue measures 71 metres, while the southern boundary to the Oran Park Administration and Library buildings measures 153 metres.

The site currently accommodates the Administration Centre, Library and associated off-street car park, with the Leisure Centre component of the site presently vacant.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

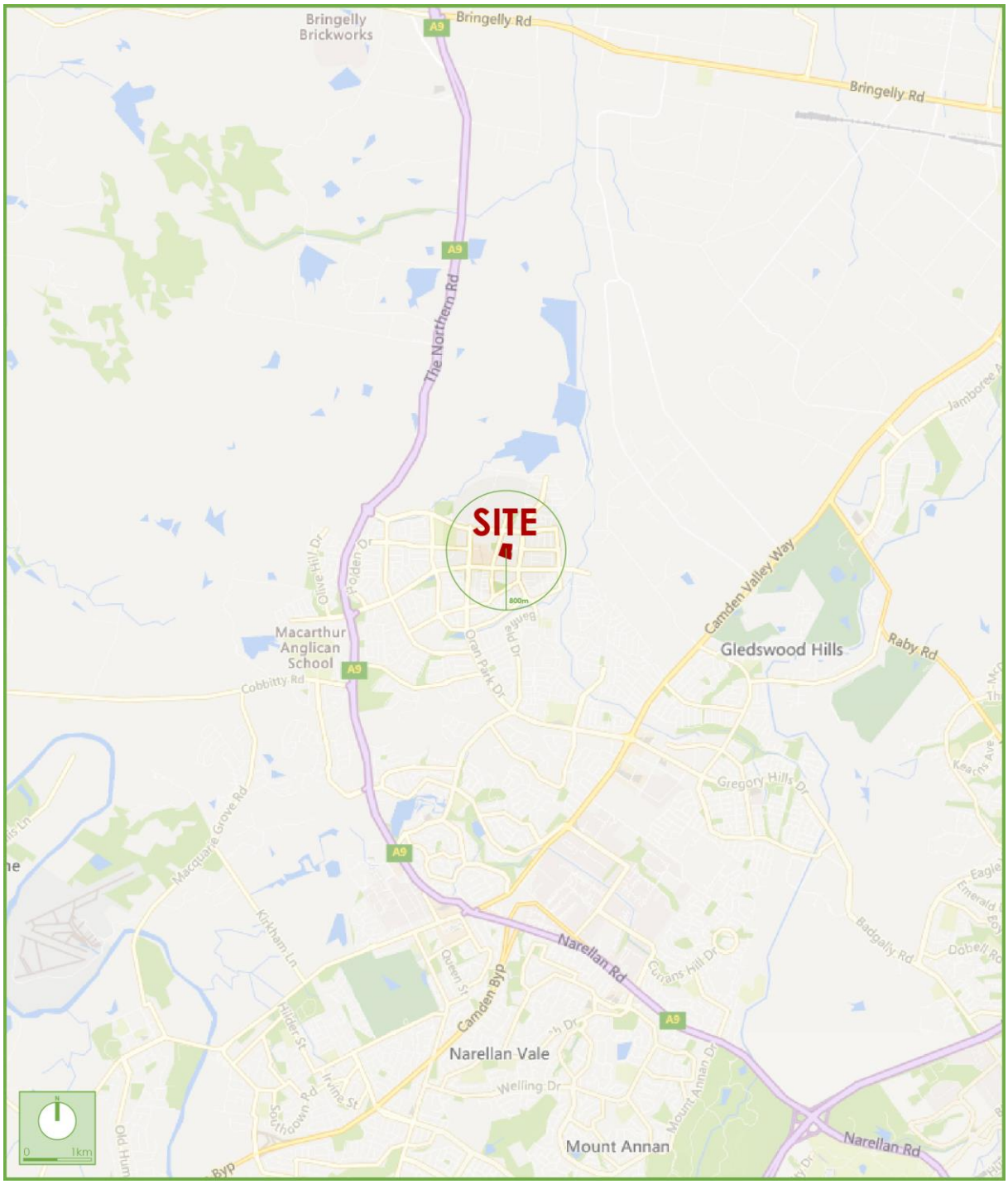


Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Dick Johnson Drive: a local road that traverses east-west between Madden Street in the east and the Northern Road in the west. Within the vicinity of the site, it accommodates two (2) lanes of traffic in each direction within a divided carriageway.
- South Circuit: a local road that traverses around the Oran Park area between Oran Park Civic Precinct and Oran Park Public School via Oran Park Drive in the south. Within the vicinity of the site, it accommodates a single lane of traffic within a divided carriageway. South Circuit permits unrestricted on-street parking along both sides of the road.
- Central Avenue: a local road that traverses north-south between a dead-end after Dick Johnson Drive in the north and Oran Park Drive in the south. Within the vicinity of the site, it accommodates a single lane of traffic in each direction within an undivided carriageway. Central Avenue permits time restricted on-street parking within indented bays along both sides of the road.
- Holstein Street: a local road that traverses north-south between Civic Way in the north and Dairy Street in the south, noting that a future road will provide a northern extension to Dick Johnson Drive. It accommodates a single lane of traffic in each direction within an undivided carriageway. Holstein Street permits unrestricted on-street parking within indented bays along both sides of the road.

- Dairy Street: a local road that traverses east-west between Holstein Street in the east and Central Avenue in the west. It accommodates a single lane of traffic in each direction within an undivided carriageway. Dairy Street permits time restricted on-street parking within indented bays along both sides of the road.
- Civic Way: a local road that traverses east-west between Madden Street in the east and Holstein Street in the west. Within proximity of the site, it accommodates a single lane of traffic in each direction within a divided carriageway. Civic Way permits on-street parking within indented bays along the south side of the road.

It can be seen from **Figure 3** that the site is conveniently located with respect to the various local and collector roads serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.

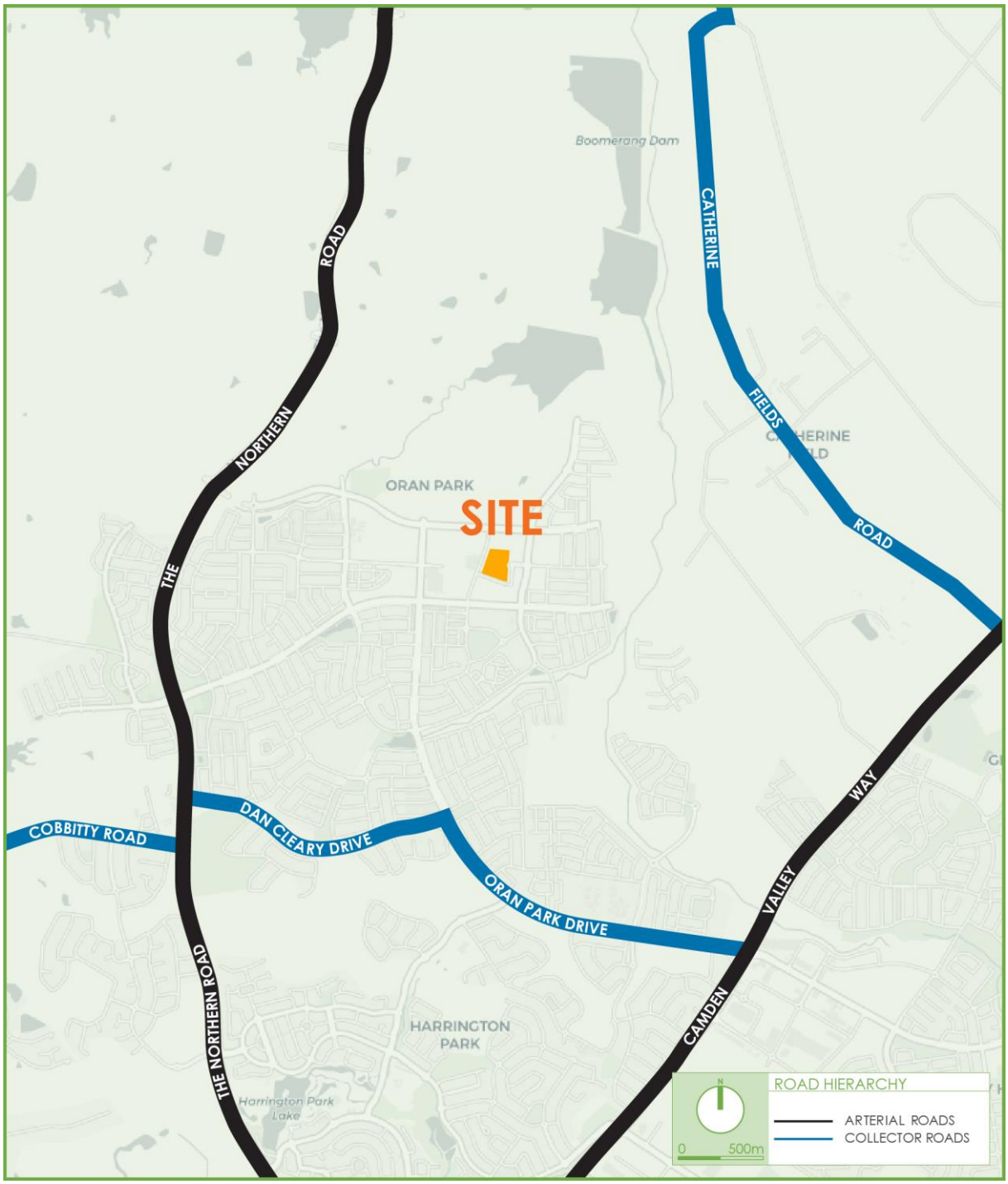


Figure 3: Road Hierarchy

3.2 Public Transport

The existing public transport services operating in the locality are presented in **Figure 4**, with the subject site situated within optimal walking distance (400 metres) of bus stops along Peter Brock Drive and Oran Park Drive. These bus stops provide bus services along the following routes:

- 840 – Oran Park to Campbelltown
- 850 – Narellan Town Centre to Minto
- 858 – Oran Park Town Centre to Leppington
- 896 – Campbelltown to Oran Park via Gregory Hills

It can be seen from the above that there are currently a limited number of public transport services operating in the area, with additional public transport services envisaged in the future, such as a potential railway station on Oran Park Drive and bus stops along Dick Johnson Drive. Accordingly, the public transport services within proximity of the site are anticipated to increase with the continued development of the Oran Park region.

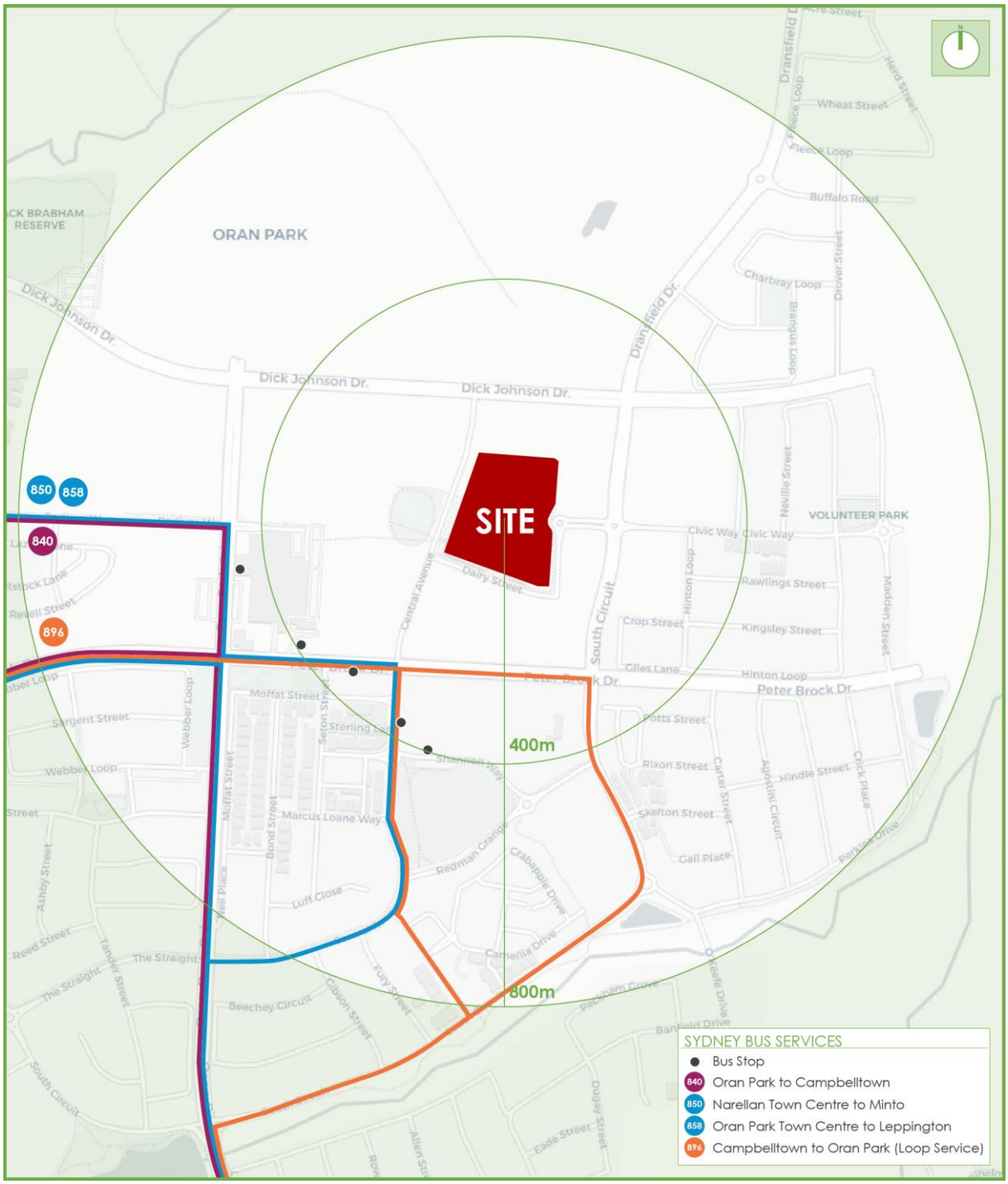


Figure 4: Public Transport

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the SEE, prepared separately. In summary, the development for which approval is now sought comprises the following components:

- Construction of a leisure centre for Camden Council with a total gross floor area (GFA) of 8,391m^2, including the following:
  - Administration, office and amenities;
  - Four (4) basketball courts;
  - Ancillary café and creche;
  - 50 metre long pool and associated concourse; and
  - LTS and leisure pools.
- Provision of 156 car parking spaces within a lower ground floor level car park;
- Provision of a separate on-site loading dock within the ground floor level that is able to accommodate a 12.5 metre long heavy rigid vehicle (HRV).

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix A**.

5. PARKING REQUIREMENTS

5.1 Car Parking

5.1.1 Oran Park Civic Precinct

The Leisure Centre is situated on the north section of the Oran Park Civic Precinct, which currently comprises a 6,000m^2 GFA Administration Centre and 2,496m^2 GFA Library. It is understood that the car parking provisions of these components were approved based on the following:

- Administration Centre car parking rate of 2.5 spaces per 100m^2 GFA based on the Camden DCP 2019 for office premises; and
- Library car parking rate of 2.9 spaces per 100m^2 GFA based on surveys at comparable facilities at Narellan and Stanhope Gardens.

In light of the above, the Oran Park Civic Precinct provides the existing car parking demands and provisions outlined in **Table 1** below.

Table 1: Existing Oran Park Civic Precinct Car Parking Provisions

Type	GFA	Applicable Car Parking Rate	Parking Demand	Parking Provided
Existing Oran Park Civic Precinct				
Administration Centre	6,000m^2	2.5 spaces per 100m^2 GFA	150	250
Library	2,496m^2	2.9 spaces per 100m^2 GFA	72.4	86
TOTAL			**222.4 (223)**	**336**

It can be seen from **Table 1** that the existing Oran Park Civic Precinct has a parking demand for 223 parking spaces and currently provides (approved) 336 parking spaces, resulting in a car parking surplus of 113 car parking spaces.

5.1.2 Leisure Centre

The Camden DCP 2019 and Oran Park Precinct DCP 2007 do not provide car parking rates and provisions for leisure centre developments. As such, in order to determine an appropriate parking provision, AECOM in consultation with Camden Council in 2013 conducted a parking study of comparable developments within western Sydney. This methodology is supported by Camden Council and resulted in the adoption of the following car parking rate:

- 3.0 spaces per 100m^2 GFA for the Leisure Centre component.

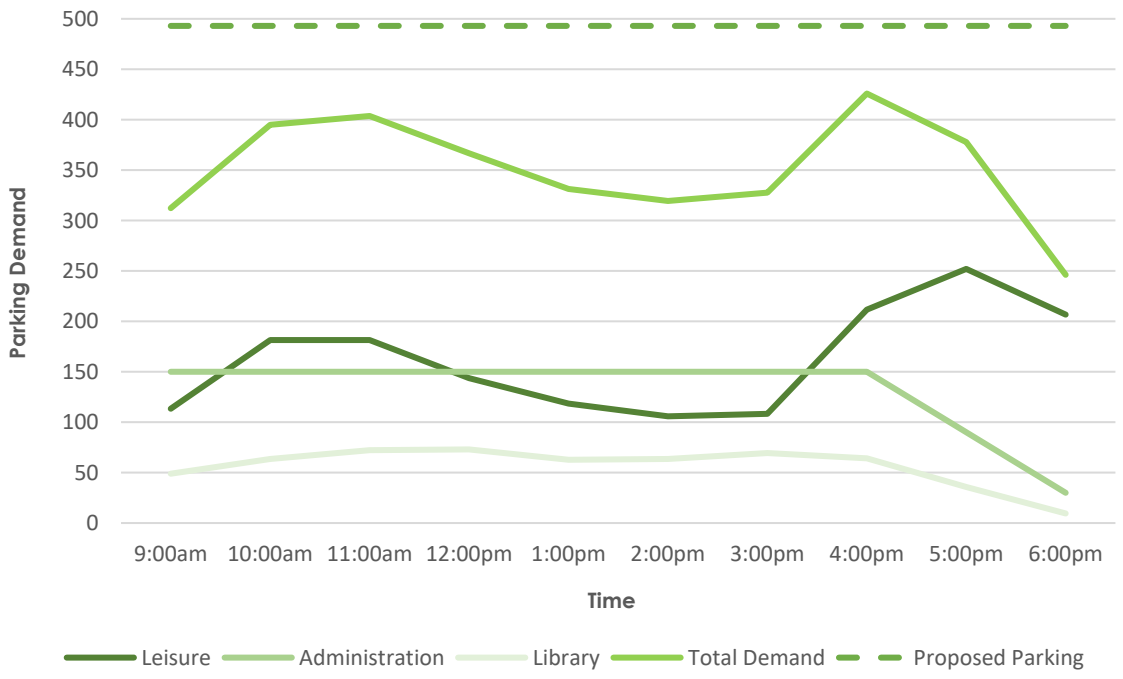
Application of this rate to the Leisure Centre with a GFA of 8,391m^2 GFA, results in a parking requirement for 252 car parking spaces, noting that Council has confirmed a 'shared parking' model for Oran Park Civic Precinct. With this in mind and in reference to **Section 5.1.1**, the Oran Park Civic Precinct currently provides 113 additional parking spaces that can readily contribute to the Leisure Centre parking provision.

In light of the above, the Leisure Centre component of the Oran Park Civic Precinct would be required to provide a minimum of 139 car parking spaces (252 minus 113 existing spaces). In response, the Leisure Centre proposes a total of 156 car parking spaces within the lower ground floor car park. This parking provision is therefore considered acceptable and will ensure all car parking demands of the Leisure Centre are contained within Oran Park Civic Precinct.

5.1.3 Cumulative Parking Assessment

It is understood that the previous parking surveys of comparable developments at Narellan and Stanhope Gardens also included parking occupancy rates throughout a typical weekday, as presented within **Chart 1** below.

Chart 1: Oran Park Civic Precinct Cumulative Parking Demand



It can be seen from **Chart 1** that the peak parking demand for Oran Park Civic Precinct is anticipated to occur at 4:00pm with a total demand for 426 parking spaces. As such, the proposed total parking provision for 492 car parking spaces is considered acceptable and will ensure all parking demands are contained within the Oran Park Civic Precinct.

5.2 Accessible Parking

The Camden DCP 2019 states that accessible car parking spaces are to be provided in accordance with the Building Code of Australia (BCA). In accordance with the BCA, the Leisure Centre (Class 9b – Up to 1,000 car parking spaces) would attract an accessible car parking requirement of one (1) space for every 50 car parking spaces or part thereof.

Application of this rate to the 252 car parking spaces of the Leisure Centre, results in the requirement for six (6) accessible parking spaces (when rounded up), all of which, have been provided within the lower ground floor car park, in compliance with the BCA.

5.3 Bicycle Parking

The Oran Park Precinct DCP 2007 states that bicycle parking be provided for all non-residential developments at a recommended rate of one (1) bicycle space per 750m^2 gross leasable floor area (GLFA). For the purposes of a conservative assessment, this rate has been applied to the 8,391m^2 GFA of the Leisure Centre, resulting in a bicycle parking requirement for 12 bicycle spaces (when rounded up).

In response, the Leisure Centre proposes 16 bicycle spaces in the form of eight (8) bicycle loops situated on the ground floor level and adjacent the gym component. This bicycle parking provision is sufficient to satisfy the requirements of the Oran Park Precinct DCP 2007, therefore considered acceptable.

5.4 Motorcycle Parking

The Camden DCP 2019 provides the motorcycle parking rate for recreation facilities at a recommended rate of one (1) motorcycle space per 50 car parking spaces in excess of the first 50 car parking spaces.

Application of this rate to the 252 car parking spaces, results in the requirement for four (4) motorcycle parking spaces. In response, the Leisure Centre proposes five (5) motorcycle parking spaces within the lower ground floor car park, thereby sufficient to comply with the DCP and will ensure all motorcycle parking requirements are contained on-site.

5.5 Swimming Carnivals

The development is proposed to accommodate school swimming carnivals, with bus parking proposed along Central Avenue. This is considered appropriate, given the following:

- It is emphasised that these school swimming carnivals are anticipated to occur on an infrequent basis throughout the year, with all events to occur outside peak periods;
- During school swimming carnivals, the pools would not be open to the general public and as such, the majority of attendees would be students and teachers, with a minimal number of spectators; and
- The majority of students and teachers would arrive / depart via coaches and as such, would result in a minimal demand for car parking spaces. Nevertheless, the proposed parking provision for the leisure centre would be available for the minimal number of potential spectators.

5.6 Refuse Collection and Servicing

The development proposes the following refuse collection and servicing arrangements, which are considered appropriate, given the infrequent servicing requirements of the Leisure Centre:

- On-street waste collection during off-peak periods on the unnamed future road along the northern frontage, with a waste room provided within the lower ground floor car park;
- Loading bay within the ground floor level, accessible from Holstein Avenue that is able to accommodate 12.5 metre long HRVs; and
- Designated loading bay parking space (during off-peak periods) within the lower ground floor car park that is able to accommodate B99 vehicles (utes and vans).

6. TRAFFIC AND TRANSPORT IMPACTS

The traffic generation and impacts of the Oran Park Civic Precinct have been taken into full account in prior strategic studies, namely the Oran Park Town Centre report prepared by AECOM. This report included the Administration Centre and Library (as approved), as well as the Leisure Centre (as sought under this application) within the approved masterplan that encompasses the Oran Park Civic Precinct. That is, the planned strategic road hierarchy and network generally is evolving in line with anticipated yields.

More specifically, the AECOM report identified a Leisure Centre with an envisaged GFA of 9,200m^2 within the approved masterplan. While the proposed development has been modified since the approved masterplan (as would be expected as detailed design progresses) these modifications resulted in a reduced GFA of 8,391m^2 and in turn, a reduced traffic generation for the Leisure Centre.

Accordingly, the traffic impacts of the proposed Leisure Centre have been assessed as part of the Oran Park Town Centre report prepared by AECOM, which demonstrated satisfactory operation and acceptable levels of service for key intersections within proximity of the site. The traffic impacts of the proposed development are therefore considered acceptable, subject to the construction of the proposed road infrastructure, as identified within the Oran Park Town Centre report prepared by AECOM.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Vehicular Access

The development proposes a total of 156 car parking spaces (User Class 2) with access to an unnamed future local road. It will therefore require a Category 3 driveway under AS2890.1 (2004), being a separated entry and exit access, with a minimum entry width of 6.0 metres, exit width of 4.0-6.0 metres and a separation of driveways width of 1.0-3.0 metres. In response, the development proposes the following access arrangements (measured at the property boundary):

- Entry access driveway width of 6.0 metres;
- Exit access driveway width of 4.0 metres; and
- Separation of driveway width of 2.2 metres.

These access arrangements are sufficient to satisfy the requirements of AS2890.1 (2004), therefore considered acceptable. It should be noted that all other spaces of the Leisure Centre are provided within an existing car park, with the associated vehicular access for these spaces anticipated to operate satisfactorily.

7.2 Internal Design

The internal car park and loading bay complies with the requirements of AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009), with the following characteristics noteworthy:

7.2.1 Parking Modules

- All car parking spaces have been designed in accordance with AS2890.1 (2004) User Class 2, being a minimum width of 2.5 metres and length of 5.4 metres.
- All accessible parking spaces have been designed in accordance with AS2890.6 (2009), being a minimum width of 2.4 metres, length of 5.4 metres and provide an adjacent shared zone with the same dimensions.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.

7.2.2 Clear Head Heights

- A minimum clear head height of 2.2 metres is to be provided for all trafficable areas within the car park, as required under AS2890.1 (2004).
- A minimum clear head height of 2.5 metres is to be provided for all accessible spaces and shared zones, as required under AS2890.6 (2009).

7.2.3 Loading Bay

- The ground floor loading bay has been designed in accordance with AS2890.2 (2018) to accommodate a 12.5 metre long HRV, being a minimum width of 3.5 metres and length of 12.5 metres.
- The loading bay is provided a maximum gradient of 1 in 25 (4%) measured in any direction, as required under AS2890.2 (2018).
- A swept path analysis has been undertaken and included in **Appendix B**, demonstrating satisfactory movements of a 12.5 metre long HRV.

7.2.4 Other Considerations

- All columns are located outside the parking space design envelope, as required under AS2890.1 (2004) Figure 5.2.
- Appropriate visual splays have been provided at all access driveways, as required under AS2890.1 (2004) Figure 3.3.

7.3 Summary

In summary, the internal configuration of the car park has been designed in accordance with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. CONCLUSIONS

In summary:

- The proposal seeks approval to construct an 8,391m^2 GFA Leisure Centre comprising administration offices, amenities, basketball courts, pools and associated car parking within the Oran Park Civic Precinct. The Leisure Centre forms part of the approved Oran Park Civic Precinct Masterplan.
- The car parking requirements of the Leisure Centre have been assessed to require 252 car parking spaces based on previous studies of comparable developments. In response, the development proposes an additional 156 car parking spaces within the lower ground floor level to compliment the 113 surplus car parking spaces of the existing Administration Centre and Library (approved within Oran Park Civic Precinct), resulting in a total parking provision of 269 car parking spaces for the Leisure Centre. This car parking provision is therefore considered acceptable and will ensure all car parking demands of the Leisure Centre are contained within the Oran Park Civic Precinct.
- The traffic generation arising from the Leisure Centre has been taken into full account within the Oran Park Town Centre report prepared by AECOM, which has since been approved and adopted by Camden Council. This report originally assessed the traffic impacts of a 9,200m^2 GFA Leisure Centre and demonstrated satisfactory operation and acceptable levels of service of key intersections within proximity of the site. It is noted that the Leisure Centre is now proposed with 8,391m^2 GFA being a reduction of 809m^2 GFA. As a result, there will be a reduction in traffic generation and is anticipated to operate satisfactory (or slightly better), subject to construction of the proposed road infrastructure.
- The internal configuration of the car park has been designed in accordance with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

Reduced Plans

Revisions

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A 25.06.21 DEVELOPMENT APPLICATION

Notes

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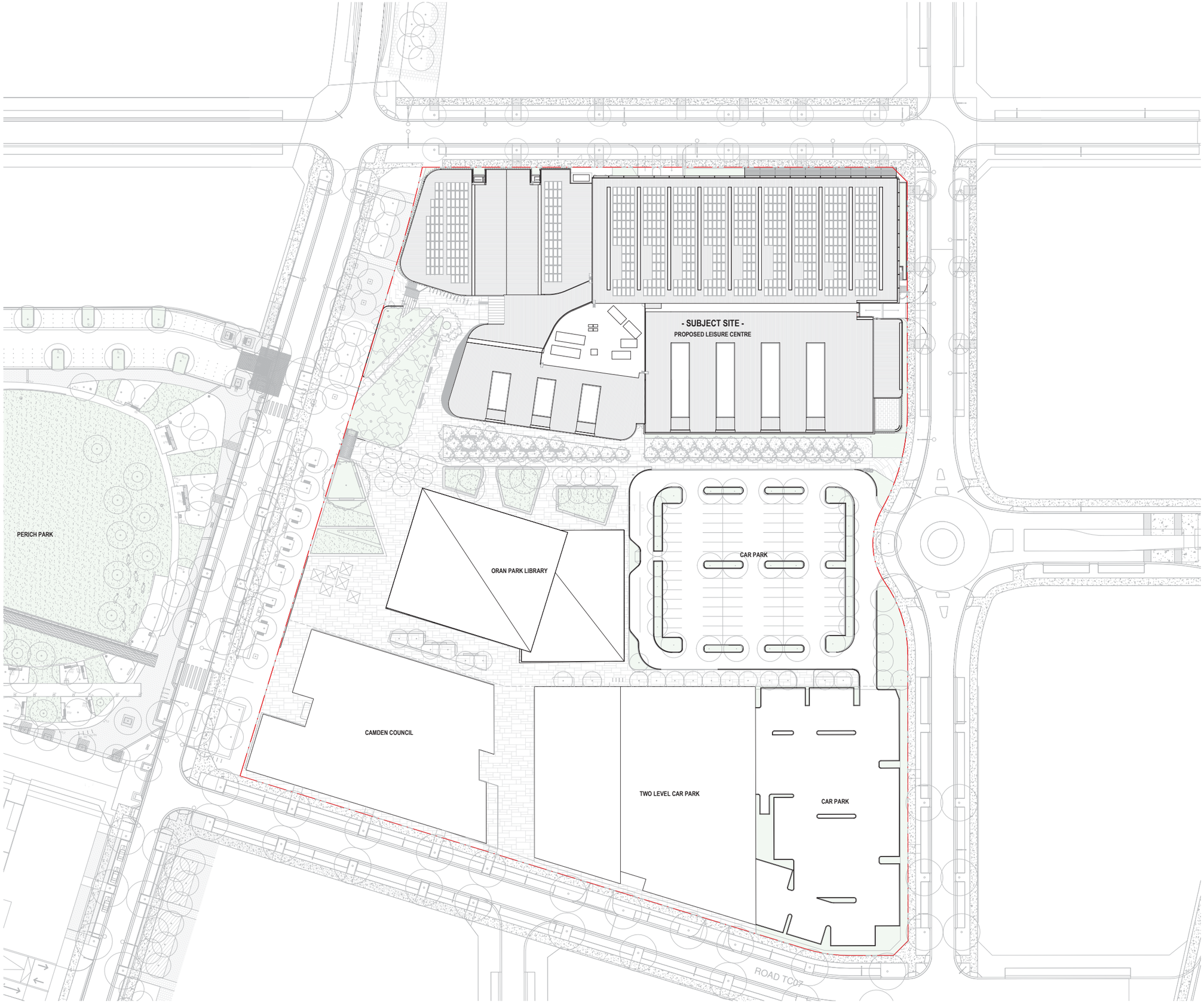

N
PROJECT NORTH

N
TRUE NORTH

Client

—

Camden Council

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Nominated Architect:
Sven Ollmann ARB NSW 11123

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Project Title

—

Oran Park Leisure Centre

Enter address here

Drawing Title

—

PROPOSED SITE PLAN

Drawing Status

DEVELOPMENT APPLICATION

Drawing Details

—

Scale	1 : 500@ A1
Date	25.06.21
Job No	9167
Drawn	WAM
Checked	WAM

Drawing No — A03.001

Revision — A

WARREN AND MAHONEY

Revisions

—

A 25.06.21 DEVELOPMENT APPLICATION

Notes

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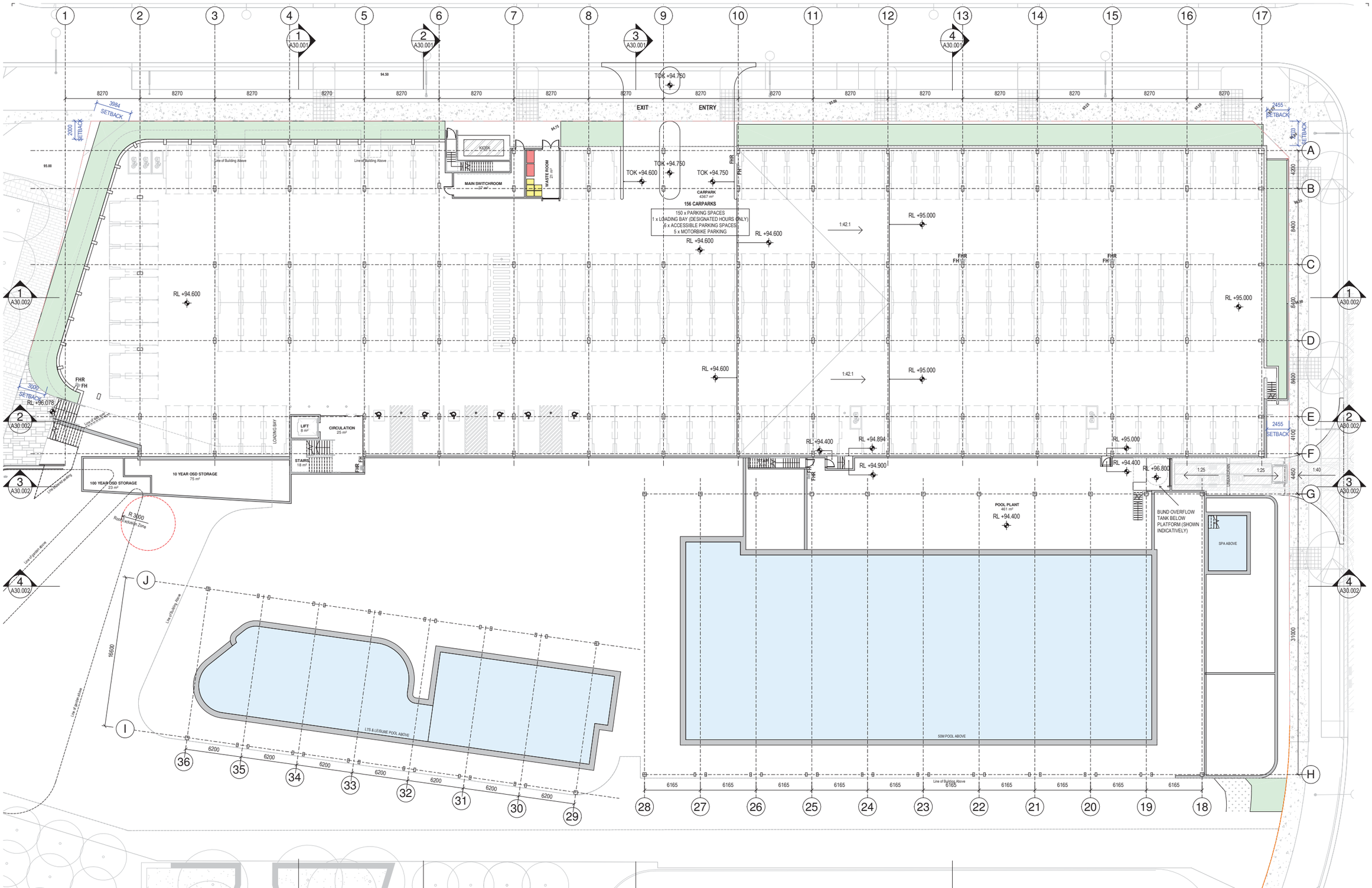

PROJECT NORTH

TRUE NORTH

LOWER GROUND FLOOR PLAN

1 : 200

Client

—

Camden Council

Warren and Mahoney Architects Australia Pty Ltd

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Nominated Architect:
Sven Ollmann ARB NSW 11123

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Project Title

—

Oran Park Leisure Centre

Enter address here

Drawing Title

—

LOWER GROUND FLOOR PLAN

Drawing Status

DEVELOPMENT APPLICATION

Drawing Details

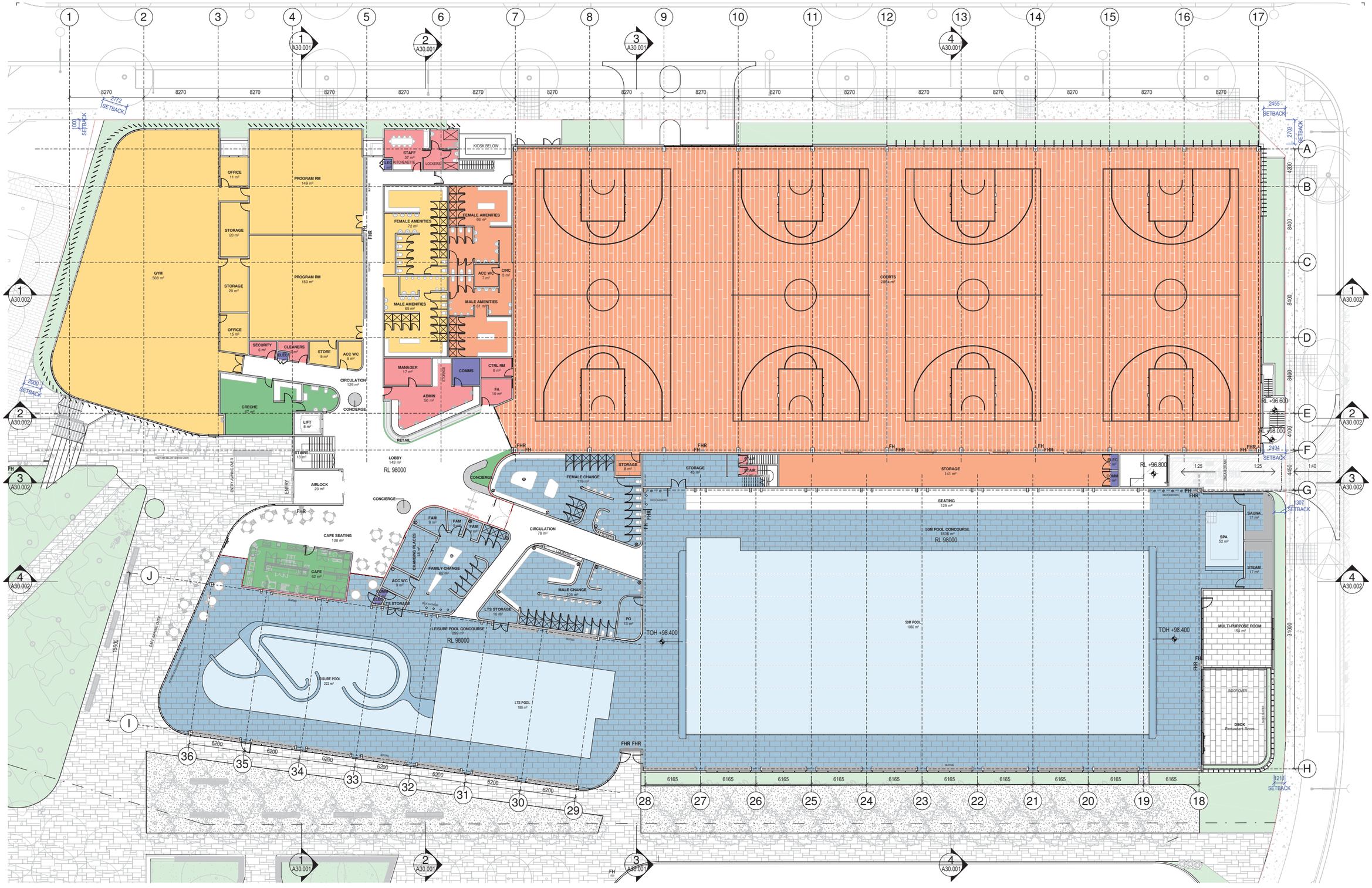
—

Scale	1 : 200@ A1
Date	25.06.21
Job No	9167
Drawn	WAM
Checked	WAM

Drawing No — A10.001

Revision — A

WARREN AND MAHONEY



GROUND FLOOR PLAN

1 : 200

All dimension to be verified on site before producing shop drawings or commencing any work.
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Revisions

—

A 25.06.21 DEVELOPMENT APPLICATION

Notes

—

N PROJECT NORTH

N TRUE NORTH

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Project Title

—

Oran Park Leisure Centre

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Drawing Title

—

GROUND FLOOR PLAN

Drawing Status

DEVELOPMENT APPLICATION

Drawing Details

—

Scale	1 : 200@ A1
Date	25.06.21
Job No	9167
Drawn	WAM
Checked	WAM

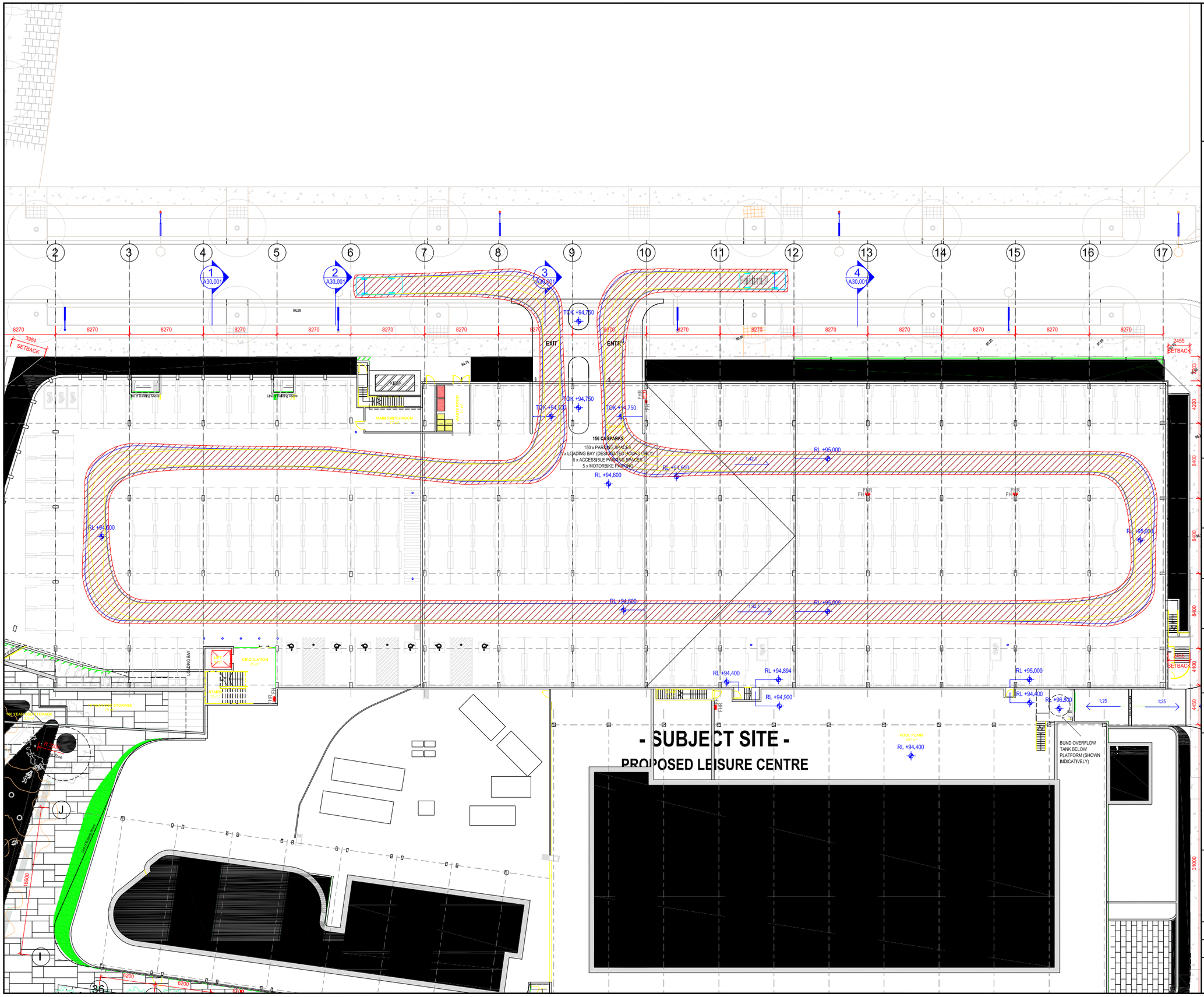
Drawing No — A10.002

Revision — A

WARREN AND MAHONEY

APPENDIX B

Swept Path Analysis



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TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1:2004 Parking facilities - Off-street car parking*, and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	25-06-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Warren and Mahoney Architects
Suite 13.03, Plaza Building Australia Square
95 Pitt Street, SYDNEY NSW 2000

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Scale / Plan Orientation

0 4 8 12 16m
1:400 @ A3

Project Description
Oran Park Leisure Centre

Drawing Prepared By

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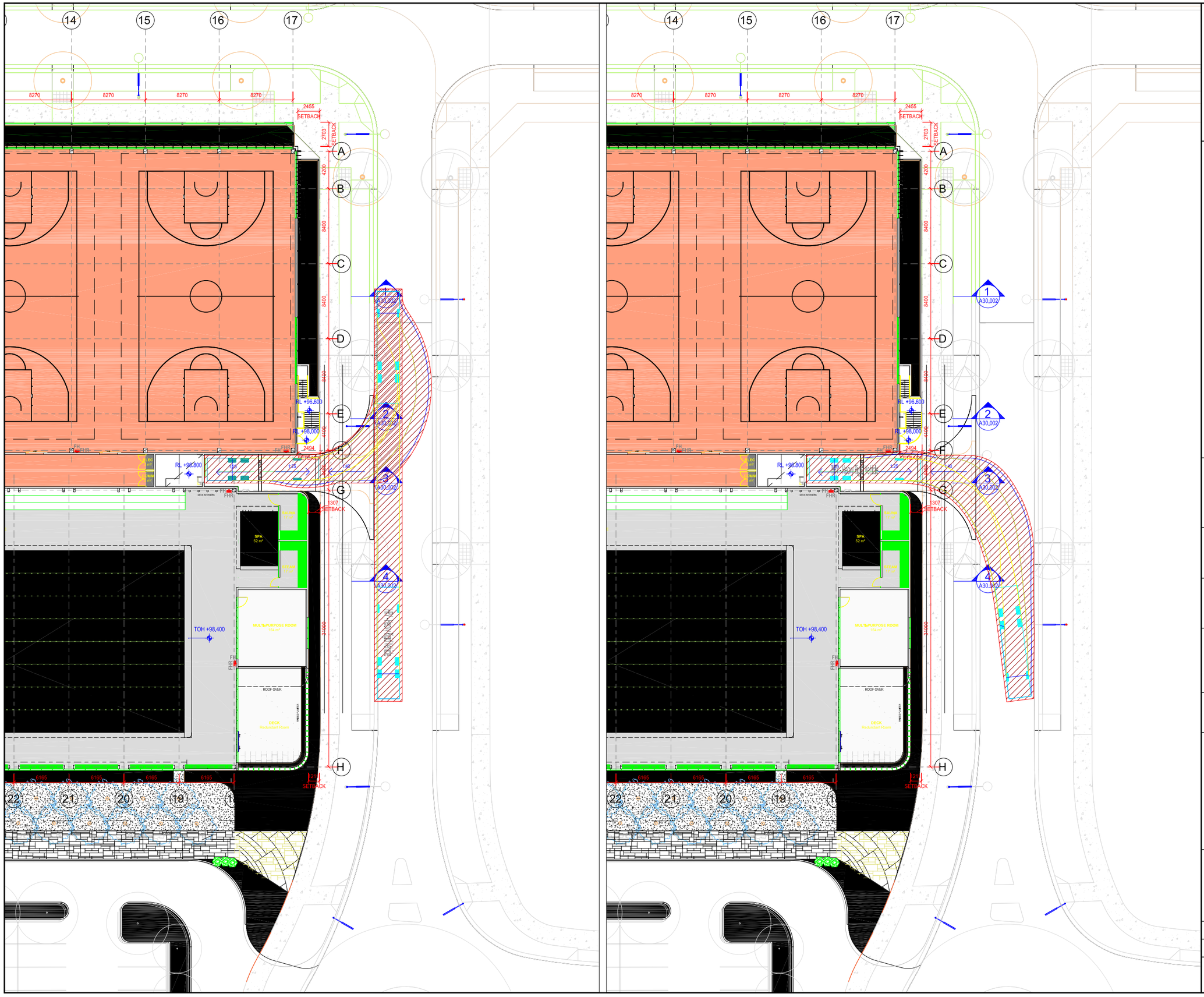
Drawing Title
Swept Path Analysis
Lower Ground Floor
B99 Design Vehicle
Vehicle Access and Circulation Movements

Drawn:	Checked:	Date:
NC	NC	25-06-2021

17.224d06v01 TRAFFIX [2021-06-25] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
17.224	DA	TX.01	A



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	25-06-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

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Scale / Plan Orientation

0 4 8 12 16m

1:400 @ A3

Project Description

Oran Park Leisure Centre

Drawing Prepared By

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Drawing Title

Swept Path Analysis
Ground Floor - Loading Bay
12.5m Heavy Rigid Vehicle
LEFT: Entry Movement
RIGHT: Egress Movement

Drawn:	Checked:	Date:
NC	NC	25-06-2021

17.224d06v01 TRAFFIX [2021-06-25] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
17.224	DA	TX.02	A

22 September 2021

Oran Park Leisure Centre
Draft Plan of Management

The following information provides some more detail in relation to questions raised for the possible operations at the Oran Park Leisure Centre. It should be noted however that the final operational model endorsed will be done as a result of external investigations currently being undertaken by the Otium Group and will be provided to Council for endorsement. This decision of council will provide the final operational approach for the facility.

Current Issues identified;
1. Management strategy for the leisure centre and the café
2. Creche operation – hours, use, staffing, activities etc.
3. Loading dock operation from Holstein Avenue (hours, how materials are transported from this area into the building, storage area and cafe etc.)
4. Use of service bay within carpark (who will use it, can it be used by community transport buses etc.)
5. Use of 'changing places' toilet (is it available to all or just parents caring for children, disability workers etc.)

Operating Hours;-

The facility is estimated to be open between 99 – 112 hours per week and operating all days except Christmas Day and Good Friday pending final operational model. The facility could vary between the hours of 5.30 am to 10.00 pm Monday to Friday, and 7.00 am to 9.00pm Saturday and Sunday. The gym has the capacity for and could be open 24 hours a day, if considered a requirement by council with separate access available outside core OPLC operational times.

Area	Open	Close	Peak(s)	Staff Non Peak	Staff Peak
Administration	8:00:00 AM	6:00:00 PM	8:45 - 10:30 & 14:30 - 17:00	5	9
Courts	8:30:00 AM	9:30:00 PM	12:30 - 15:00 & 16:00 - 21:30	1	2
Fitness	5:30:00 AM	9:30:00 PM	6:00 - 8:00 & 17:00 - 19:30	3	6
Leisure/LTS Pool	5:30:00 AM	9:30:00 PM	9:30 - 11:30 & 15:30 - 18:00	4	12
50m Pool	5:30:00 AM	9:30:00 PM	15:30 - 18:30 & Weekends	4	6
Maintenance	7:00:00 AM	3:00:00 PM		1	1
Café	6:30:00 AM	6:00:00 PM	7:00 - 10:30 & 15:00 - 17:00	2	4
				20	**40**

OPLC Management Strategy;-

Management/Staffing A range of management models could be implemented for the “day to day” management and operation of the facility. A proposed model below could be one of the options that is available however further work is currently being undertaken to establish the Council endorsed operational model for the facility.

The proposed standalone staffing structure for OPLC is listed as follows on the next page.

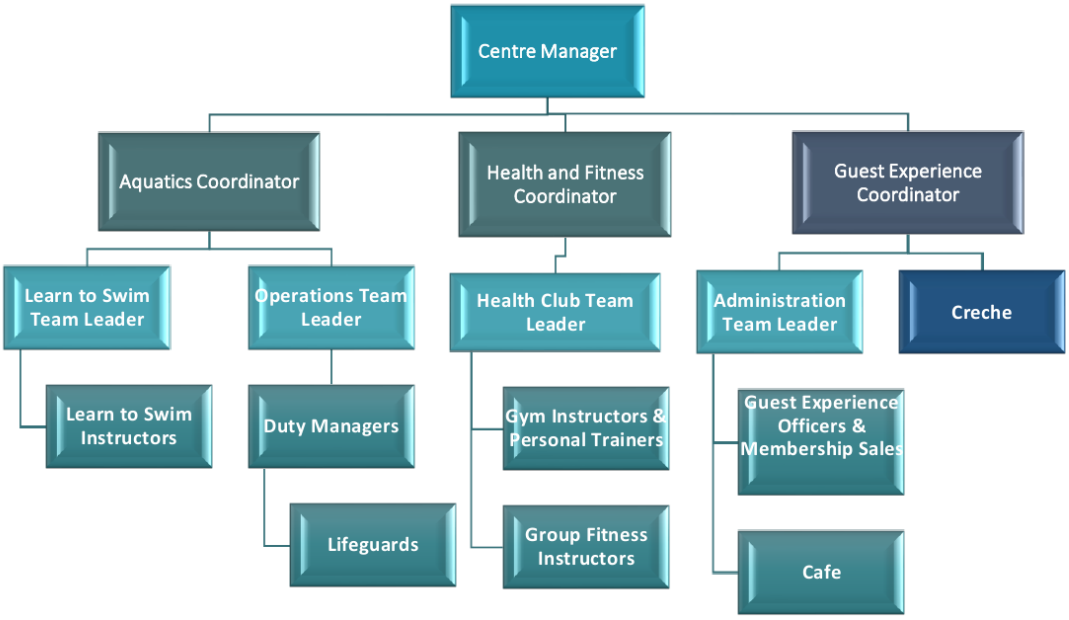

Figure 22 –Proposed OPLC Organisational Structure

A summary of key staffing positions and allocations by Full Time Equivalent (FTE) positions salary is listed below.

Table 15 – Proposed Staffing FTE

Staff Position	OPLC FTE Staff (Full Time Equivalent)
Centre Manager	1
Guest Experience Manager	1
Administration Team Leader	1
Café	2.5
Guest Experience Officers	3.3
Health and Fitness Coordinator	1
Health Club Team Leader	1
Gym instructors	1.4
Group fitness instructors	1.7
Aquatics Coordinator	1
Operations Team Leader	1
Learn to Swim Team Leader	1
Aquatic instructors	2.3
Duty Managers	0.6
Lifeguards	8.5
Membership consultants	1.5
Creche	1.5
TOTAL	**31.3 FTE**

This operating model identifies the requirement of FTE staff for the Café and the Creche facilities based on the operational hours of the facility and the requirements of each of these outlets to be open. Essentially the Café could have a hourly spread of up to 12 hours per day and the Creche of up to 8 hours per day pending confirmation of the final model and peak usage times.

Loading Dock;-

The use of the loading dock in Holstein Ave would be for bulk deliveries directly related to the pool operations for the majority of the operations. There may be some instances of other parts of the facility utilising this loading bay but this would be expected to be ad hoc and infrequent. (refer to traffic report)

The materials delivered into this area would be regular without being frequent and where possible have delivery schedules that are outside peak traffic times for the use of this road – ie. before 8.30am or around developed peak usage for this access road once in operation.

It is anticipated that smaller deliveries for café, retail stock or gym disposables would be affected by smaller vans that would have the capability to utilise the loading bay in the carpark for short periods and again would be generally outside peak times for use.

Service Bay;-

The use of the service bay car park will be accessed for a variety of users including small community transport vehicles to allow easy and safe passage to the lift access of the facility. (refer to traffic report)

Changing Places;-

The changing places areas would refer to the Changing Places - Campaign for accessible public toilets to meet all requirements and access parameters including specific key access or centre managed access for requested use.

There will be additional facilities available for targeted groups such as families, people with special needs, care workers and clients. The general public will have access to other change areas that provide the appropriate levels of privacy and service to ensure all needs and groups are catered for.

School Carnivals/Events;-

Bus parking for major events (e.g. school carnivals) is available in front of the building on Central Avenue. The existing civic plaza and adjoining areas will allow large groups to safely wait on entering or leaving the facility.

The large entry foyer will allow school groups easy access directly into the pool hall.

The multi-purpose room and external area will also be used as a marshalling area for events.

Paul Clarke
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Please contact the Project Manager should you require any further information:

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Oran Park Leisure Centre ESD Report

For Warren and Mahoney

Revision	Date	Description	Author
0	27/08/2021	ESD Report	AS

The reader's attention is drawn to the following important information:

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Introduction

This Environmentally Sustainable Design (ESD) Report has been prepared for the proposed leisure centre development at Oran Park, New South Wales, to summarise the ESD initiatives proposed for the project.

The intent is to outline the sustainability initiatives design consideration for the development.

Building Description

The proposed development is a leisure centre comprises of indoor aquatic hall, health and fitness area, indoor sports court and associated front of house and amenities.

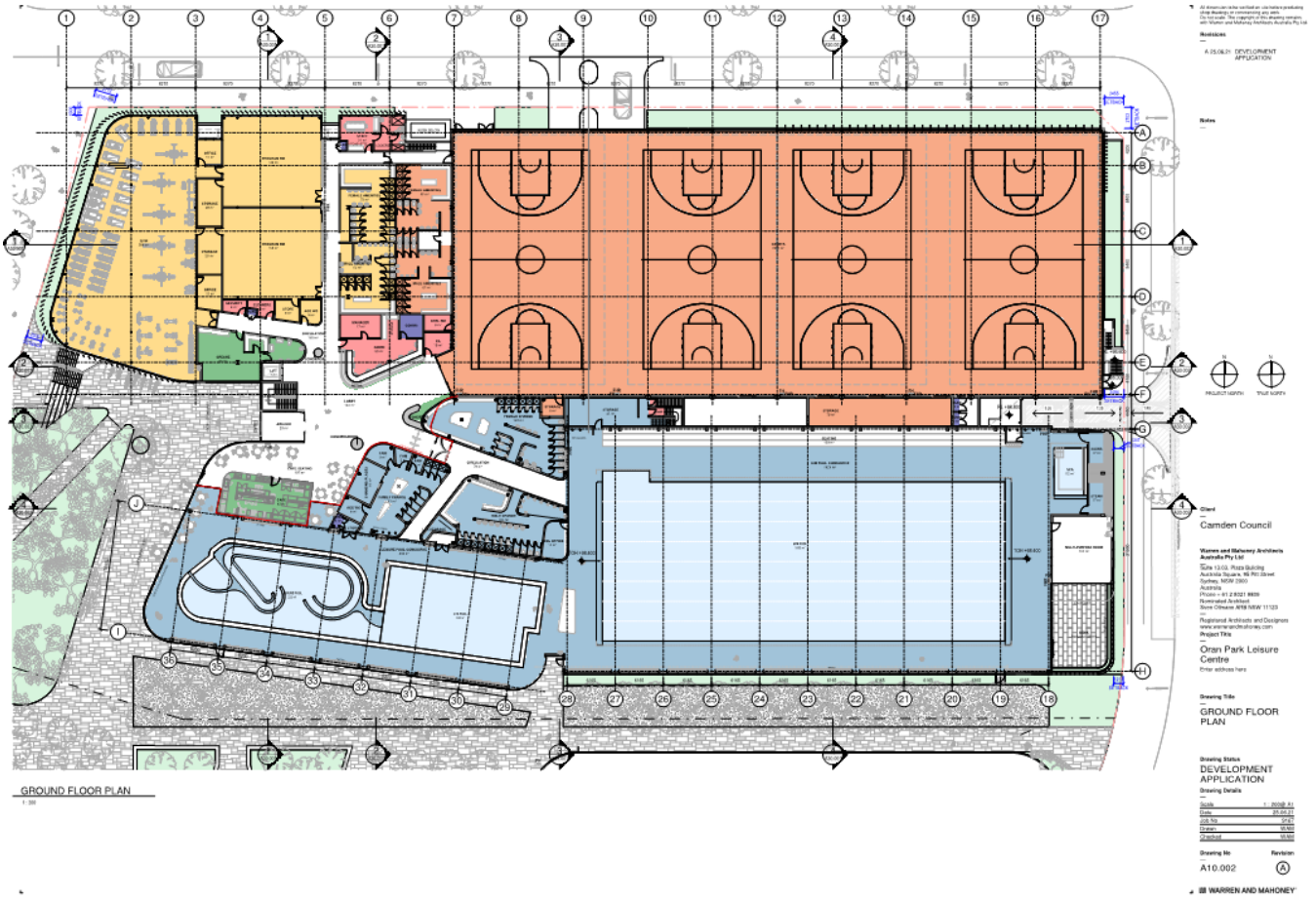

Figure 1: Ground Floor plan (Ref: Dwg A10.002)

Key ESD Initiatives

Energy

Building Fabric

The NCC 2019 Section J contains mandatory requirements for the design of building envelope and features to minimise energy use. The proposed development in this project will be designed to be better than the minimum requirements specified under NCC 2019 Section J Deemed-to-Satisfy (DTS) requirements.

Preliminary glazing to façade ratio options study has been carried out during the early concept stage to provide a comparative overview of the required glazing system performance in relation to glazing to façade ratio of varying degree based on the NCC Section J DTS assessment. The following provide the summary of concept stage options study conducted:

Glazing Options	Glazing Thermal Performance	Est. Wall-Glazing Facade Ratio Limit	Wall System Compliant R-Value	Floor System Compliant R-Value	Roof System Compliant R-Value
Single Glazed Low-E system	*U-value 4.3W/m²K, SHGC 0.47* *(Equivalent to 6.38mm Comfort Plus Neutral in Capral 100mm 419 Flushline framing; VLT 0.53)*	North: 33% East: 20% South: 33% West: 20%	R1.4	R2.0	R3.2 *(solar absorptance of the upper roof surface ≤ 0.45)*
Double Glazed System	*U-value 3.6W/m²K, SHGC 0.64* *(Equivalent to 6mm Clear/ 12mm Air Gap/ 6mm Clear in Capral 100mm 419 Flushline framing; VLT 0.69)*	North: 20% East: 20% South: 20% West: 20%	R1.4	R2.0	R3.2 *(solar absorptance of the upper roof surface ≤ 0.45)*
Double Glazed Low-E System	*U-value 2.9W/m²K, SHGC 0.40* *(Equivalent to 6.38mm Comfort Plus Neutral/ 12mm Air Gap/ 6mm Clear in Capral 100mm 419 Flushline framing; VLT 0.46)*	North: 32% East: 10% South: 32% West: 10%	R1.4	R2.0	R3.2 *(solar absorptance of the upper roof surface ≤ 0.45)*

Double Glazed Double Low-E System	*U-value 2.8W/m²K, SHGC 0.38* *(Equivalent to 6.38mm Comfort Plus Neutral/ 12mm Air Gap/ 6mm Energy Advantage in Capral 100mm 419 Flushline framing; VLT 0.43)*	North: 39% East: 20% South: 39% West: 20%	R1.4	R2.0	R3.2 *(solar absorptance of the upper roof surface ≤ 0.45)*

Figure 2: Concept Stage Glazing to Façade Ratio vs. Glazing Performance Options Study

As the design evolved to detailed design stage, NCC Section J JV3 alternative performance pathway energy modelling is currently underway. The JV3 modelling will allow trade-offs between building fabric performance to achieve optimised building fabric solution. The JV3 report will be provided once available.

Solar Photovoltaic System

A 300kWp solar photovoltaic system has also been considered for the development, to be mounted at the roof of health and fitness, and the indoor courts space. The system is estimated to generate approximately 390,000kWh renewable energy per year which will reduce the reliance on grid electricity and be sold back to grid during off peak energy demand.

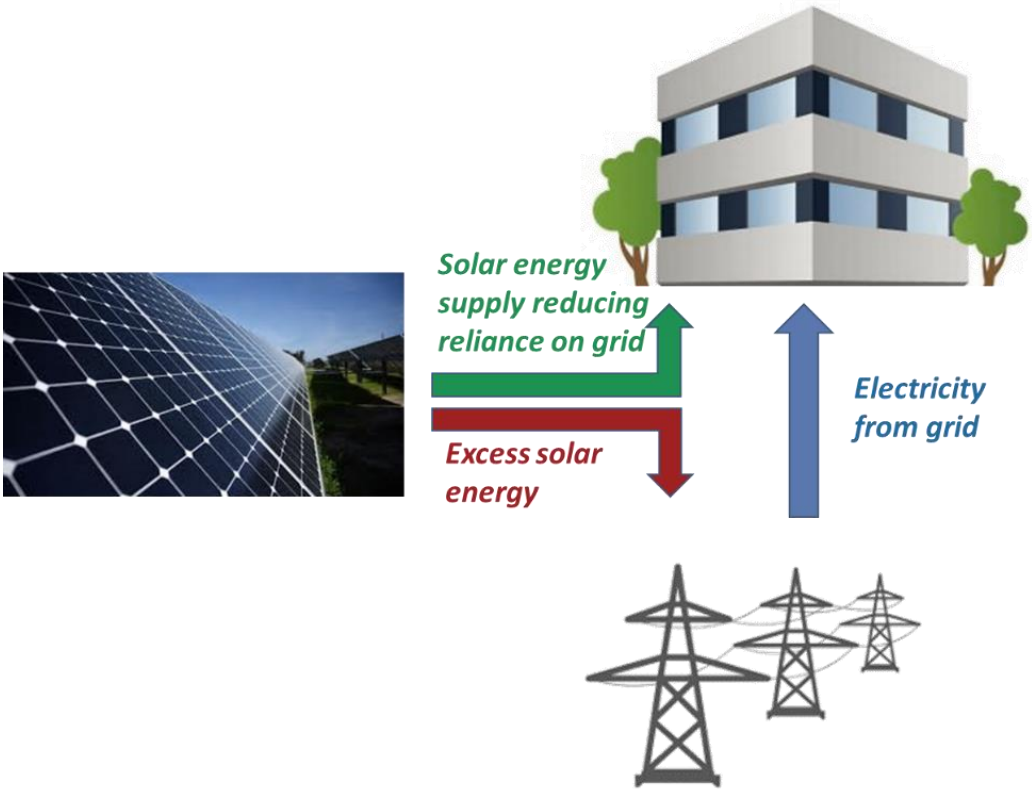

Figure 3: Concept Stage Glazing to Façade Ratio vs. Glazing Performance Options Study

Ethylene Tetrafluoroethylene (ETFE) Skylight

Instead of conventional glazed skylight, ETFE skylight is proposed for the development. The ETFE is a lightweight material and has a lower thermal conductivity compared to glass. It also provides the flexibility in customizing frit patterns such that a balance can be achieved between daylight access and solar heat gain control.

Figure 4: ETFE Cushion (Ref: https://www.vector-foiltec.com/texlon-etfe/)

Heat Pump

The pool air conditioning system and pool water heating is cooled/heated via air cooled heat pumps. Heat pumps are an efficient way to provide cooling and heating and, when powered by renewables, can significantly reduce carbon emissions compared to gas heating. The heat pumps specified have a heat recovery function which recycles waster heat from the air conditioning system to heat the pool water, thus further reducing energy consumption.

Intelligent Energy Efficient Control System via. DEOS OPENdynamics

The air conditioning system will be controlled using Proprietary DEOS OPENdynamics control strategy. OPENdynamics allows all operating parameters of the energy supply in the ventilation ducts as well as in the rooms to be continuously measured and monitored. This enable airflow to be optimised and hence reduced associated fan running costs whilst ensuring the humidity level and its associated condensation risk, and comfort level at the pool area is well maintained.

Water

Rainwater reuse

Rainwater will be collected from the roof and stored for use in irrigation as well as topping up the swimming pools. The design is anticipated to capture approximately 96% of rainwater annually which provides potable water saving of up to 850kL per month.

Water Efficient Fittings

To reduce water demand from potable water source, water efficient sanitary fixtures with the following WELS rating may be considered where feasible.

Fixture/ Equipment Type	Min. WELS Rating
Taps	6 Star
Urinals	6 Star
Toilet	*4 Star*
Showers	3 Star (> 4.5 but ≤ 6.0)
Clothing Washing Machines	5 Star
Dishwashers	6 Star

Table 1: Water Efficient Fixture Best Practice WELS rating

Materials

To reduce sustainability impact from resource consumption within the building, sustainable products and low emissions materials are to be considered where feasible and appropriate. The following sections outlined the requirements and standards of industry best practice and widely recognised Green Star – Design and As Built v1.3 green rating:

Paints, Adhesives, Sealants, Carpets & Engineered Wood

Where feasible, at least 95% of all internally applied paints, adhesives, sealants (by volume) meet the TVOC limits as detailed in Table 1.

Product Category	Max. TVOC content (g/L) of ready to use product
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16; and ≥ 50% of all paints by volume must have TVOC limit of ≤ 5g/L (i.e. Ultra low VOC)
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing	250

membranes and sealant, fire retardant sealants and adhesives	
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Table 2: Max TVOX content limit for paints, adhesives and sealants

Carpets

Where feasible, at least 95% of all carpet (by area) products meet the product certification requirement or the Total VOC (TVOC) limits.

The following credit requirements is applicable to all carpets used for internal application of the building.

a) Select and install carpets that are certified with the following certification levels. The certificate must be current and valid at time of purchase:
   (i) GECA 50-2011 v2 - 'Carpets' - Level A;
   The certified products can be searched from the following link,(http://geca.eco/product-finder/)
   (ii) GreenTag GreenRate v4.0 Level A or Level B;
   The certified products can be searched from the following link,
   (https://www.globalgreentag.com/?archive_template=search.php&s=carpet&post_type=products)
   (iii) ECS v1.2 Level 4 (two options) - Level A;
   (iv) ECS v1.2 Level 3 - Level B;
   (v) ECS v1.2 Level 2 - Level C;
   The certified products for (iii) to (v) can be searched from the following link,
   (https://www.carpetinstitute.com.au/xls/environment/ECSCarpetNameRating20200430.xls)

   OR

b) Select and install carpets that are certified with the following maximum TVOC content validation via laboratory testing:

Laboratory Testing **Max TVOC content in grams per litre (g/L) of ready to use product.**		
Compliance Option	**Test Protocol**	**Limit**
ASTM D5116	ASTM D5116 - Total VOC limit	0.5mg/m2 per hour
	ASTM D5116 - 4-PC (4-Phenylcyclohexene)	0.05mg/m2 per hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5mg/m2 per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m2 per hour

Table 3: Max TVOX content limit for carpets

Engineered Wood Products

Where feasible, at least 95% of all new engineered wood products meet the product certification requirement or the formaldehyde emission limits. Engineered wood products are such as particleboard, plywood, medium density fibreboard (MDF), Laminated Veneer Lumber (LVL), High-Pressure Laminate (HPL), Compact Laminate and decorative overlaid wood panels used for internal application of the building. Timber veneers and all engineered wood products used in carparks, as formwork and other non-engineered wood products (e.g. milled timber) can be excluded.

a) Select and use compliant engineered wood products with the following certification levels. The certificate must be current and valid at time of purchase:

(i) GECA 25-2011 v2 - 'Floor Coverings' - Level A;

(ii) GECA 04-2011 v2 - 'Panel Boards' - Level A;

(i) GECA 40-2008 v1.1 - 'Hard Surfacing' - Level A;

The certified products can be searched from the following link, (http://geca.eco/product-finder/)

(ii) GreenTag GreenRate Standards (all Levels);
The certified products can be searched from the following link, (https://www.globalgreentag.com/blog/product_category/engirneered-wood/)

OR

b) Select and use compliant engineered wood products with the following maximum TVOC content validation via laboratory testing:

Laboratory Testing Test Protocol	Emission Limit/Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1mg/m²hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m²hr**
ASTM E1333	≤0.12mg/m²hr***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m²hr
EN 717-2 (also known as DIN EN 717-2)	≤0.35mg/m²hr

*mg/m²hr may also be represented as mg/m²/hr.
**The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.
***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

Table 3: Max TVOX content limit for Engineered Wood Products

Best Practice PVC

Where feasible, at least 90% (by cost) of all flooring, blinds, permanent formwork, pipes and cables used meet either of these requirements:

a. Do not contain PVC (as reflected in product Safety Data Sheet or product Environmental Product Declaration (EPD));
   i. *OR*
b. Certified under BEP PVC registry (https://www.vinyl.org.au/in-greenstar/best-practice-pvc-product-register)

Available at: https://www.vinyl.org.au/in-greenstar/best-practice-pvc-product-register

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74 Central Avenue, Oran Park NSW 2570

CONSTRUCTION WASTE MANAGEMENT PLAN

25/06/2021
Revision B

Client

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SCOPE

A Waste Management Plan (WMP) is to be submitted with all development applications for new and change-of-use developments that will generate construction, demolition and operational waste.

This WMP applies only to the **construction** phase of the proposed development, being that the site is a greenfield site. The requirements outlined in this WMP must be implemented on site during construction and may be subject to review upon any change to the design. Construction waste management requirements will also be subject to review as part of the Construction Management Plan.

The waste management for the **operational** phase of the development is not addressed in this report. An operational WMP will need to be provided separately. Elephants Foot Recycling Solutions (EFRS) can supply this if necessary.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description
Rev A	25/06/2021	D Trinder	A Armstrong	Draft
Rev B	25/06/2021	D Trinder	A Armstrong	Final

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1 INTRODUCTION

1.1 Background

EFRS has been tasked to prepare the following waste management plan for Camden Council for the management of construction waste generated by the leisure centre development located at 74 Central Avenue, Oran Park NSW 2570.

Waste management strategies and auditing are a requirement on construction sites to promote strong sustainability outcomes. It is EFRS's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill, by implementing convenient and efficient waste management systems

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development

iii. ***Comply*** with all relevant Australian Standards, council codes, policies, and guidelines.

1.2 Site Summary

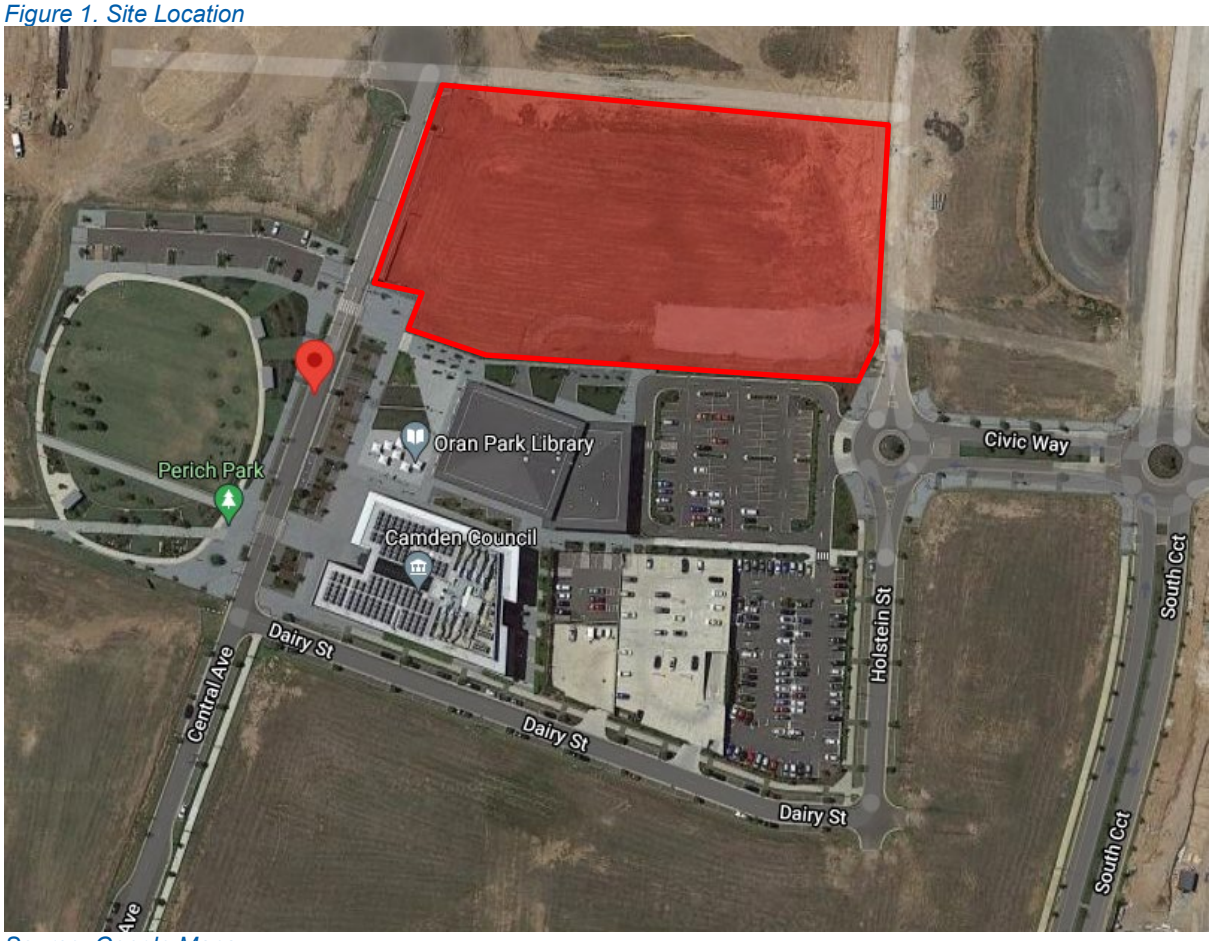
The site falls under the LGA of Camden Council and is currently unoccupied (greenfield site). The proposed development consists of one (1) building with two (2) levels (Lower Ground and Ground). The development will be a multipurpose community facility consisting of aquatic, indoor sports, health and fitness, crèche, and public café.

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

1.3 Site Location

The site is located at 74 Central Avenue, Oran Park NSW 2570, as shown below (boundaries are indicative only). The site has frontage to Central Avenue, Holstein Street, and a new road. Vehicular access is via the new road, with a loading dock also located via Holstein Street.

Figure 1. Site Location



Source: Google Maps

1.4 Legislation and Guidance

Information provided in this WMP comes from a wide range of construction waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Camden Council Waste Management Guideline 2019
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide – Recycling and Re-use Across the Supply Chain*. (2014, November).
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

1.5 Waste Diversion Targets

To quantify and measure this sustainable approach to waste management, the NSW WARR Strategy 2014-2021 outlines specific targets in order to clarify the state's long-term goals and priorities. These targets were supported by industry, community, state, and local governments during the Strategy's consultation phase, and include:

- Increasing construction and demolition recycling rates to 80%
- Increasing waste diverted from landfill to 75%
- Reducing litter by 40%
- Reduce illegal dumping incidents by 30%

1.6 Report Objectives

Throughout this report, EFRS aims to encourage where practical, having regard to the design, the nature of the material to be demolished and the site constraints, the following waste management practices for the duration of the demolition and construction stages of the development:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used on-site as appropriate, or recycled off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard waste returned to supplier for recycling;
- Framing timber re-used on site or recycled off-site;
- Windows, doors and joinery recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Plumbing, fittings and metal elements recycled off site;
- Ordering accurate quantities of materials and prefabrication of materials where possible;
- Re-use of formwork;
- Careful source separation of off-cuts to facilitate re-use, resale or recycling.

1.7 Limitations

This report has been prepared by EFRS for the sole purpose of providing a construction Waste Management Plan (WMP) to support a development application. The report is provided with the following limitations:

- This report is for the sole use of the client (including their officers, employees and advisers) and should not be used or relied upon by any other party without prior written consent from EFRS;
- Drawings, estimates and information contained in this report have been prepared by analysing information, plans and documents supplied by the client, or nominated third parties. Any assumptions based on the information contained in the report are outside the control of EFRS;
- The calculations presented in the report are estimates only. The amount of waste generated will be dependent on the approach taken by site management, including the levels of training and education offered to site staff and the actions and attitudes of staff themselves.
- The site manager will make adjustments as required based on actual waste volumes (e.g. if waste volumes are greater than estimated, then waste storage capacity and collection frequencies will increase accordingly) and increase the amount of waste storage and collection frequency accordingly;
- The report has been prepared with all due care and attention; however, no assurance or representation is made that the WMP reflects the actual outcome. EFRS will not be liable to for any plans or outcomes that are not suitable for purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFRS offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- Examples of equipment provided in this report should be reviewed by the appropriate equipment supplier who will assess the correct equipment for supply. Reference to any other business or product besides EFRS and EFRS equipment is for information purposes only, and is not officially endorsed or recommended by EFRS.

1.8 Camden Council

Council Objectives for Waste Minimisation and Management

The garbage and recycling will be guided by the services and acceptance criteria of the Camden Council. All construction activities are to be in conducted in compliance with the Oran Park Precinct Development Control Plan 2007, Camden Development Control Plan 2019, Camden Council Waste Management Guideline 2019, Australian Standards and statutory requirements.

The information provided in this report will be assessed against the following Camden Council objectives regarding the management of waste from construction activities:

- Pursue opportunities to reuse or recycle the building materials on-site or elsewhere;
- Incorporate the use of prefabricated components and recycled materials where appropriate;
- Arrange for the delivery of materials so that materials are delivered 'as needed' to prevent degradation of materials through weathering and moisture damage causing additional waste; and
- Return excess materials to supplier or manufacturer as appropriate.

2 GENERAL WASTE MANAGEMENT PROVISIONS

2.1 Stakeholder Roles and Responsibilities

All stakeholders have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Contractor will be responsible for implementing this WMP, although site staff have a responsibility to ensure their own compliance at all times. Where possible, an Environmental Management Representative (EMR) should also be appointed for the project to help ensure compliance. The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Construction Site Management	• Organise waste collections as required; • Organise replacement or maintenance requirements for bins; • Investigate and ensure prompt clean-up of illegally dumped waste materials; • Notify the Principal Certifying Authority (Council) of the appointment of waste removal, transport or disposal contractors for waste tracking purposes; • Ensure waste related equipment is well maintained; • Ensue accurate calculations so only the required amount of materials are ordered; • Ensure segregation of materials to maximise reuse and recycling; • Check waste sorting and storage areas routinely for cleanliness, hygiene, contamination and OH&S issues; • Ensure all monitoring and audit results are well documented and are carried out as specified in the WMP; • Ensure effective signage, communication and education is provided to site staff/contractors; • Provide staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers;
Site Staff/Contractors	• Ensure adequate separation and disposal of waste streams in compliance with the WMP; • Abide by all relevant OH&S legislation, regulations, and guidelines; • Attend training and inductions as required; • Clean and transport bins as required; • Carry out daily visual inspections of waste storage areas; • Organise, maintain and clean the waste storage areas;
Environmental Management Representative (EMR)	• Approach and establish the local commercial reuse of materials where reuse on-site is not practical; • Establish separate skips and recycling bins for effective waste segregation and recycling purposes; • Ensure staff and contractors are aware of site requirements; • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the development; • Contaminated waste management and approval of off-site waste transport, disposal locations and check licensing requirements; • Arrange assessment of suspicious potentially contaminated materials, hazardous materials and liquid waste; • Monitor, inspect and report requirements.
Waste Collection Contractors	• Provide a reliable and appropriate waste collection service; • Provide feedback to construction site management regarding contamination of waste streams; • Work with construction site management to customise waste systems where possible.

2.2 Monitoring and Reporting

It is recommended that the following measures be taken to improve construction waste management in future and to provide more reliable waste generation figures:

- Compare projected waste quantities with actual waste quantities produced.
- Conduct waste audits of current projects (where feasible).
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council or the EPA if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training should be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and should include the contact details of the 24-hour EPA Pollution line. Likely incidents to occur during the construction and demolition stage of the development may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

2.3 Opportunities for Reuse and Recycling

There are many opportunities to reduce the volume of waste generated during construction. Adaptive reuse of building materials should be encouraged, with significant consideration given to methods of reusing or recycling materials onsite as well as sourcing used or recycled materials from elsewhere to be used on site.

The site should facilitate where practical reuse and recycling by 'deconstruction', whereby various materials are carefully dismantled and sorted. Any unwanted reusable materials can be taken to a second-hand building centre, reducing waste disposal costs.

Materials that are individually wrapped should also be avoided where possible, with preference given for materials that can be delivered in returnable packaging such as timber pallets.

The table below gives examples of potential reuse and recycling options for the materials likely to be used/generated in construction and demolition at this development:

Table 2: Potential Reuse/Recycling Options for Construction Materials

Material	Reuse/Recycling Potential
Asphalt	Hot in-place recycling or reprocessed into Reclaimed Asphalt Pavement (RAP).
Bricks	Cleaned and/or rendered for reuse, crushed for fill, sold or provided to a recycled materials yard
Cardboard Packaging	Recycled at a paper/cardboard recycling facility
Carpet	Cleaned and reused for the same purpose, reused in landscaping or garages/sheds, recycled at an appropriate processing facility
Concrete, Masonry, Spoil	Reused on-site as fill, levelling or crushed for road base
Doors, Windows, Fittings	Reused in new or existing buildings or sent to second-hand supplier
Glass	Recycled at a glass recycling facility, aggregate for concrete production, crushed for termite barrier, reused as glazing
Green Waste (Organics)	Mulched, composted for reuse, trees chipped for use in landscaping or removed carefully and reused onsite or sold
Hardwood Beams	Reused as floorboards, fencing, furniture or sent to second-hand timber supplier
Insulation Material	Reprocessed to remove impurities and reused for the same purpose or as off-cuts, compressed for ceiling tile manufacture
Metal, Steel/Copper Pipe	Recycled at a metal recycling facility, melted into secondary materials for structural steel, roofing, piping etc. copper sold for re-use
Other Timber	Reused in formwork, ground into mulch for garden or sent to second-hand timber supplier
Plasterboard	Crushed for reuse in manufacture of new plasterboard, returned to supplier or used in landscaping
Plastics	Reused as secondary materials for playgrounds, park benches etc.
Roof Tiles	Cleaned and reused, crushed for reuse for landscaping and driveways or sold or provided to a recycled materials yard
Soil	Stockpiled onsite for reuse as fill
Synthetic & Recycled Rubber	Reused for the same purpose or reprocessed for use in manufacture/construction of safety barriers, speed humps
Topsoil	Stockpiled onsite for reuse in landscaped areas

2.4 Management of Hazardous Waste Materials

For the purpose of this report, hazardous waste materials include any waste that poses a hazard or potential harm to human health or the environment, particularly asbestos waste and asbestos containing material (ACM).

During the construction phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Site Manager is to stop work immediately in that location and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

2.5 Management of Excavation Waste

For the purpose of this report, excavation waste consists of any unwanted material generated from excavation activities such as a reduced level dig, site preparation and levelling and the excavation of foundations, basements, tunnels and service trenches. This will typically consist of soil and rock.

All excavated material generated on this site may be re-used in the landscaping or used on other sites as fill material, provided no contamination is present. If sandstone is found to be present, this may be sold or incorporated into the building design.

The following measures and safeguards will apply to the development for excavated material:

- Wherever practical, excavation material will be reused as part of the development;
- Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot;
- A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes;
- Transportation routes for excavation material removed from site will be identified and used.

3 SITE SPECIFIC WASTE MANAGEMENT PROVISIONS

3.1 CONSTRUCTION WASTE VOLUMES AND MANAGEMENT

Waste generated during the construction stage of the development will be managed by the principal contractor and sub-contractors, with materials being reused and recycled wherever possible. Where neither reuse nor recycling are possible, waste will be disposed of as general waste at a licensed landfill site.

Recyclable material generated during construction will largely consist of off-cuts and discarded bricks, timber, steel, concrete, tiles, plasterboard, and piping, as well as packaging materials.

It is important to note that source separation of waste on-site may offer cost savings when compared to the disposal of mixed waste at landfill sites. Further cost savings may be achieved through the use of reusable and recycled-content materials and by reusing materials salvaged from the demolition stage of the development.

The table below illustrates the anticipated volumes of materials generated at this development during the construction stage. Volumes have been advised by our client.

Table 3: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Excavation Material	5500	5500.0	99.8%
Green waste	2315	463.0	80%
Bricks	52	62.4	100%
Tiles	14	14.0	100%
Concrete	416	624.0	100%
Timber	417	79.2	33%
Plasterboard	16	3.2	50%
Metals	111	55.5	100%
Asbestos	-	-	0%
Other waste	2	0.6	0%
Totals	**8843**	**6801.9**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the construction materials will be managed, and estimates percentage of materials diverted from landfill.

Table 4: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	**5500.0**	☒	☒	☒	**4950.0**
Green Waste	☐	**463.0**	☐	☒	☒	**370.4**
Bricks	☐	**62.4**	☐	☒	☐	**62.4**
Tiles	☐	**14.0**	☐	☒	☐	**14.0**
Concrete	☐	**624.0**	☐	☒	☐	**624.0**
Timber	☐	**79.2**	☐	☒	☒	**26.1**
Plasterboard	☐	**3.2**	☐	☒	☒	**1.6**
Metals	☐	**55.5**	☐	☒	☐	**55.5**
Asbestos	☐	**-**	☐	☐	☐	**-**
Other Waste	☒	**0.6**	☐	☐	☒	**0.0**
Total		**6801.9**	**Total**			**6104.0**
Total Diversion of Waste from Landfill (Minimum 80%)						**89.7%**

3.2 Recycling Directory

Construction and demolition materials removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* and disposal at facilities appropriately licensed to receive the particular materials.

Please find the below recommendations for recycling drop off locations for all materials likely to be generated at this development. Only the nearest locations are provided. See www.businessrecycling.com.au for additional locations:

	Business Name	Suburb	Distance (km)
Excavation Material	SUEZ Spring Farm Resource Recovery Park	Spring Farm	3.5
	Bingo Recycling Centre	Minto	12.8
	Bingo Recycling Centre	Ingleburn	15.9
Green waste	SCRAP Ltd	Holsworthy	26.2
	Benedict Recycling	Belrose	29.5
	Benedict Recycling	Chipping Norton	29.5
Bricks	Bingo Recycling Centre	Minto	12.8
	Bingo Recycling Centre	Ingleburn	15.9
	SUEZ Lucas Heights Resource Recovery Park	Lucas Heights	26.3
Tiles	Bingo Recycling Centre	Minto	12.8
	Bingo Recycling Centre	Ingleburn	15.9
	SUEZ Lucas Heights Resource Recovery Park	Lucas Heights	26.3
Concrete	SUEZ Lucas Heights Resource Recovery Park	Lucas Heights	26.3
	AKA Civil	Rosehill	28.4
	Benedict Recycling	Belrose	29.5
Timber	Bingo Recycling Centre	Minto	12.8
	reDirect Recycling	Ingleburn	15.3
	Bingo Recycling Centre	Ingleburn	15.9
Plasterboard	Bingo Recycling Centre	Minto	12.8
	Bingo Recycling Centre	Ingleburn	15.9
	Benedict Recycling	Belrose	29.5
Metals	SUEZ Spring Farm Resource Recovery Park	Spring Farm	3.5
	Scrap Metal Recyclers and Brokers	Campbelltown	10.8
	Bingo Recycling Centre	Minto	12.8

3.3 Site-Specific Operational Measures

Training/Site Inductions

All staff employed during the demolition and construction stages of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.

Induction training will include the following at a minimum:

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- The implications of poor waste management practices;
- Correct use of general-purpose spill kits;
- Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

Materials Selection and Ordering

- Selection of all materials will be undertaken by architectural designers;
- Prefabrication of materials off-site where possible;
- Materials requirements are to be accurately calculated to minimise waste from over-ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.

Waste Avoidance Opportunities

- Limiting unnecessary excavation;
- Selection of construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork;
- Planned work staging;
- Use of naturally ventilating buildings to reduce ductwork;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
- Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Reduction of PVC use;
- Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- Use of fittings and furnishings that have been recycled or incorporate recycled materials;
- Use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Site Procedures

- Excavated materials will be used onsite where practical;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;
- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

3.4 Location and Design of Waste Management Facilities

General Requirements

All waste management facilities onsite should:

- Be conveniently located to enable easy access for on-site movement and collection;
- Be incorporated with other loading/unloading facilities;
- Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;
- Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;
- Have adequate weather protection and, where required, be enclosed or undercover;
- Be secure and lockable;
- Be well-ventilated and drained to the sewer;
- Be clearly sign-marked to ensure appropriate use.

Waste and Recycling Receptacles

A sufficient quantity of skip bins should be provided for the separate storage of each type of C&D material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.

The size of the receptacles should be appropriate to the nature of waste generated and the available storage area. In general, the following options would be acceptable:

Bin Size	Access	Dimensions
2.5m	Top loading	
3m	Drop door walk-in	
4m	Drop door walk-in	
5m	Drop door walk-in	
6m	Double doors walk-in	

Source: Aussie Bins

If the developer chooses to adopt a traditional waste management strategy, whereby waste is deposited into comingled skip bins to be sorted offsite, single skip bins would be considered sufficient for purpose. However, if the site is to pursue source separation, dedicated skips for the following materials are recommended:

- Timber;
- Plasterboard;
- Concrete;
- Bricks;
- Scrap metal;
- General waste.

Separate receptacles for the safe disposal of hazardous waste types (i.e. light bulbs, batteries, etc) will also be provided where applicable. Where possible, additional bins will be provided in common areas for the collection of commingled recyclables such as beverage containers (glass, plastic, aluminium), paper products, recyclables food containers, etc. Specialised bins for cigarette butts should also be provided.

Safety and Signage

The following safety measures should be considered for the waste storage area:

- Location should not interfere with sight lines of drivers entering or leaving the site;
- Skip bins should be clearly visible and located in well-lit areas;
- Safe paths of travel should be designated using reflective tape, barriers and cones;
- Skip bins must be secured and must not be over-filled to reduce risk of injury through bins moving and falling objects.

Standard signage will be installed in all waste areas, with all skip bins colour coded and labelled appropriately on all sides to allow clear identification of the type of waste to be deposited into each bin.

Refer to the EPA's website for standard construction waste and recycling signs:

www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Space and Siting Requirements

The waste storage area will be located adjacent to the entrance of the site to enable access and allow sufficient space for the required skip bins and servicing requirements. The storage area will also be flexible in order to cater for change of use throughout demolition and construction works.

Where space is restricted, dedicated stockpile areas will be allocated onsite, with regular transfers to the dedicated skip bins for sorting and collections.

The position of the designated waste holding area onsite may change according to building works and the progression of the development. Access, visual amenity and WHS will always be integral to the selection of waste storage area locations. Any stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

Servicing and Transport

The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Construction Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should be organised for within 24 hours.

All skip bins leaving the site will be covered with a suitable tarpaulin to reduce spillage of waste while in transit.

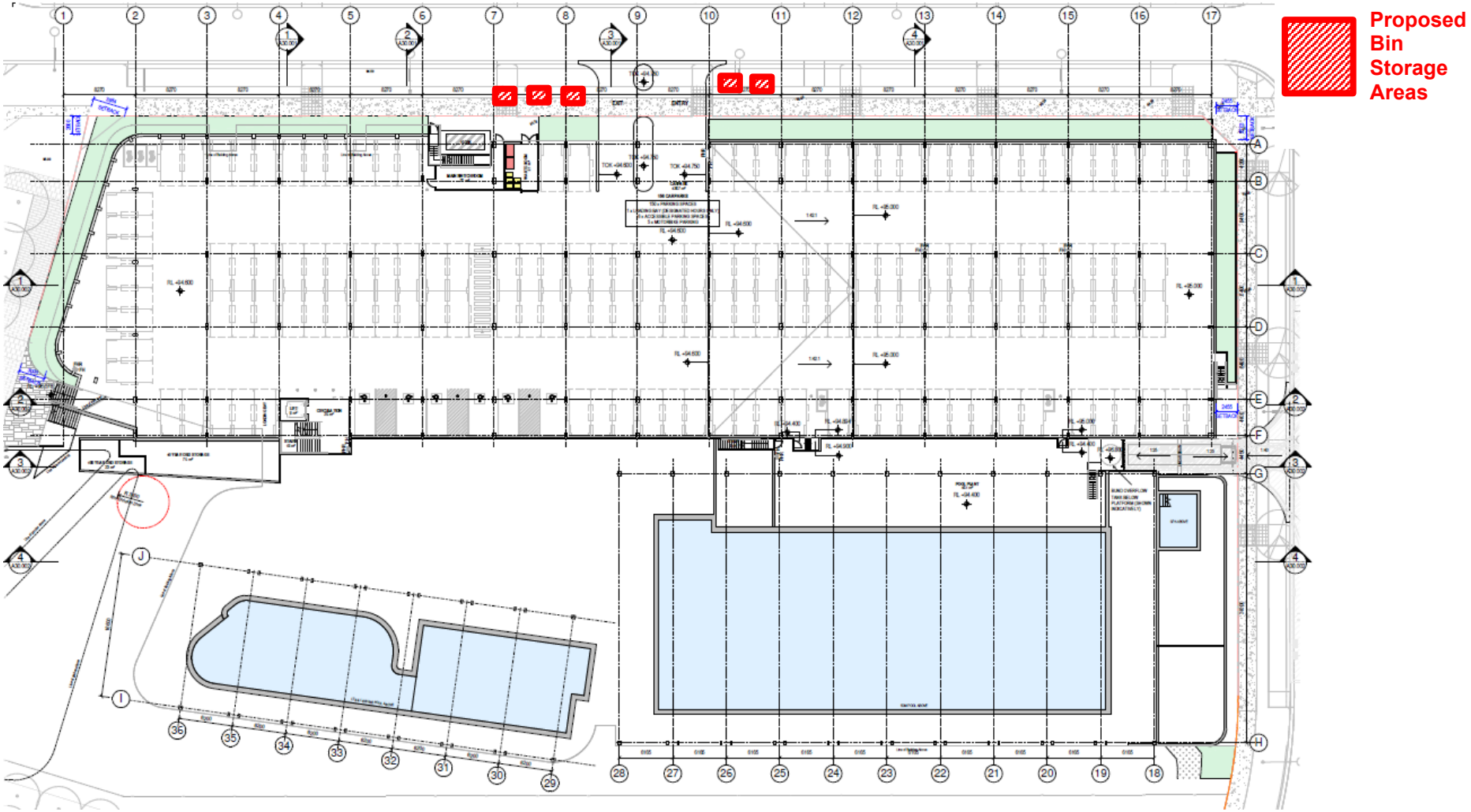
All waste collection for construction works will be conducted between approved hours as per Council requirements (typically between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays). All waste generated on site will be transported to an approved and appropriately licensed resource recovery facility and/or landfill site.

3.5 Architectural Plans

Existing Site & Excavation

Source:

Proposal



Source: Warren and Mahoney, Drawing No A10.001[A], Lower Ground Floor Plan, 25.06.2021

Oran Park Leisure Centre
74 Central Avenue, Oran Park NSW 2570

OPERATIONAL WASTE MANAGEMENT PLAN

25/06/2021
Report No. SO1037
Revision D

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GLOSSARY OF ABBREVIATIONS AND TERMS

TERM	DESCRIPTION
Baler	A device that compresses waste into a mould to form bales which may be self-supporting or retained in shape by strapping
Bin-carting Route	Travel route for transferring bins from the storage area to a nominated collection point
Collection Area/Point	The identified position or area where general waste or recyclables are loaded onto the collection vehicle
Compactor	A machine for compressing waste into disposable or reusable containers
Composter	A container/machine used for composting specific food scraps
Crate	A plastic box used for the collection of recyclable materials
DA	Development Application
DCP	Development Control Plan
EPA	Environmental Protection Authority
HRV	Heavy Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
L	Litre(s)
LEP	Local Environmental Plans guide planning decisions for local government areas
Liquid Waste	Non-hazardous liquid waste generated by commercial premises that must be connected to sewer or collected for treatment and disposal by a liquid waste contractor (including grease trap waste)
Mobile Garbage Bin(s) (MGB)	A waste container generally constructed of plastic with wheels with a capacity in litres of 120, 240, 360, 660, 1000 or 1100
MRV	Medium Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
Onsite Collection	When the collection vehicle enters the property and services the development within the property boundary from a designated loading area
Owners Corporation	An organisation or group of persons that is identified by a particular name and acts, or may act, as an entity
Service Bins	Bin set side to be placed under a chute while the remainder of the bins are being collected
SRV	Small Rigid Vehicle described by AS 2890.2-2002 Parking facilities – Off-street commercial vehicle facilities
WHS	Workplace Health and Safety
Wheel-in wheel-out service	A type of waste collection service offered by local councils where the council waste collection personnel enter the premises to collect the bins and returns them to the property

1.0 INTRODUCTION

Elephants Foot Recycling Solutions (EFRS) has been engaged to prepare the following waste management plan for the operational management of waste generated by Oran Park Leisure Centre development located at 74 Central Avenue, Oran Park NSW 2570.

Waste management strategies and audits are required for new developments in order to support the design and sustainable performance of the building. It is EFRS's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill by implementing convenient and efficient waste management systems.

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development.

iii. ***Comply*** with all relevant council codes, policies, and guidelines.

To achieve these objectives, this operational waste management plan (OWMP) identifies the different waste streams likely to be generated during the operational phase of the development, as well as how the waste will be handled and disposed, details of bin sizes/quantities and waste rooms, descriptions of the proposed waste management equipment used, and information on waste collection points and frequencies.

It is essential that this OWMP is integrated into the overall management of the building and is clearly communicated to all relevant stakeholders.

1.1 SCOPE OF REPORT

This operational waste management plan (OWMP) only applies to the **operational** phase of the proposed development; therefore, the requirements outlined in this OWMP must be implemented during the operational phase of the site and may be subject to review upon further expansion of, and/or changes to the development.

The waste management of the **construction** and **demolition** phases of the development are not addressed in this report. A separate construction and demolition WMP has been prepared by EFRS.

1.2 REPORT CONDITIONS

The purpose of this report is to document an OWMP as part of a development application, which is supplied by EFRS with the following limitations:

- Drawings, estimates and information contained in this OWMP have been prepared by analysing the information, plans and documents supplied by the client and third parties including Council and other government agencies. The assumptions based on the information contained in the OWMP is outside the control of EFRS,
- The figures presented in the report are an estimate only – the actual amount of waste generated will be dependent on the occupancy rate of the building/s and waste generation intensity as well as the building management's approach to educating residents and tenants regarding waste management operations and responsibilities,
- The building manager will adjust waste management operations as required based on actual waste volumes (e.g. if waste is greater than estimated) and increase the number of bins and collections accordingly,
- The report will not be used to determine or forecast operational costs or prepare any feasibility study or to document any safety or operational procedures,
- The report has been prepared with all due care; however no assurance is made that the OWMP reflects the actual outcome of the proposed waste facilities, services, and operations, and EFRS will not be liable for plans or results that are not suitable for purpose due to incorrect or unsuitable information or otherwise,
- EFRS offer no warranty or representation of accuracy or reliability of the OWMP unless specifically stated,
- Any manual handling equipment recommended in this OWMP should be provided at the recommendation of the appropriate equipment provider who will assess the correct equipment for supply,
- Design of waste management equipment and systems must be approved by the supplier,
- EFRS cannot be held accountable for late changes to the design after the OWMP has been submitted to Council,
- EFRS will provide specifications and recommendations on bin access and travel paths within the OWMP, however it is the architect's responsibility to ensure the architectural drawings meet these provisions,
- EFRS are not required to provide information on collection vehicle swept paths, head heights, internal manoeuvring or loading requirements. It is assumed this information will be provided by a traffic consultant,
- Council are subject to changing waste and recycling policies and requirements at their own discretion.

This OWMP is only finalised once the Draft Watermark has been removed. If the Draft Watermark is present, the information in the OWMP is not confirmed.

2.0 LEGISLATION & GUIDANCE

Waste management and resource recovery regulation in Australia is administered by the Australian Constitution, Commonwealth laws, and international agreements. State and territory governments maintain primary responsibility for controlling development and regulating waste. The following legislation has been enacted in New South Wales, and provides the lawful underpinnings of this OWMP.

- NSW Environmental Planning & Assessment Act 1979
- NSW Protection of the Environment Operations Act 1997
- NSW Waste Avoidance & Resource Recovery Act 2001
- Environmental Planning and Assessment Regulation 2000

At the local level, councils or Local Government Areas (LGAs) require OWMPs to be included in new development applications. This OWMP is specifically required by:

- Oran Park Precinct Development Control Plan 2007
- Camden Development Control Plan 2019
- Camden Local Environmental Plan 2010

The primary purpose of a development control plan (DCP) is to guide development according to the aims of the corresponding local environmental plan (LEP). The DCP must be read in conjunction with the provisions of the relevant LEP.

Information provided in this OWMP comes from a wide range of waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Camden Council Waste Management Guideline 2019
- State Environmental Planning Policy (Sydney Region Growth Centres) 2006
- NSW Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012
- NSW Better practice guide for resource recovery in residential developments 2019
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

2.1 COUNCIL OBJECTIVES

Council considers waste management to be highly important for the protection and enhancement of both the natural and built environments. A such, Council aims to:

- Minimise waste generation and disposal to landfill wherever possible.
- Ensure waste can be effectively managed onsite.
- Ensure that it is as easy to recycle as it is to dispose of garbage during all stages of development.
- Ensure that users can easily use and understand waste management systems.
- Ensure adequate storage areas are provided for general and recyclable waste during all stages of development.
- Ensure easy and efficient transportation of waste can occur onsite.
- Ensure safe access and manoeuvrability for waste collection vehicles during all stages of development.
- Ensure all developments are planned and equipped for the on-going waste management during operational life.

3.0 DEVELOPMENT OVERVIEW

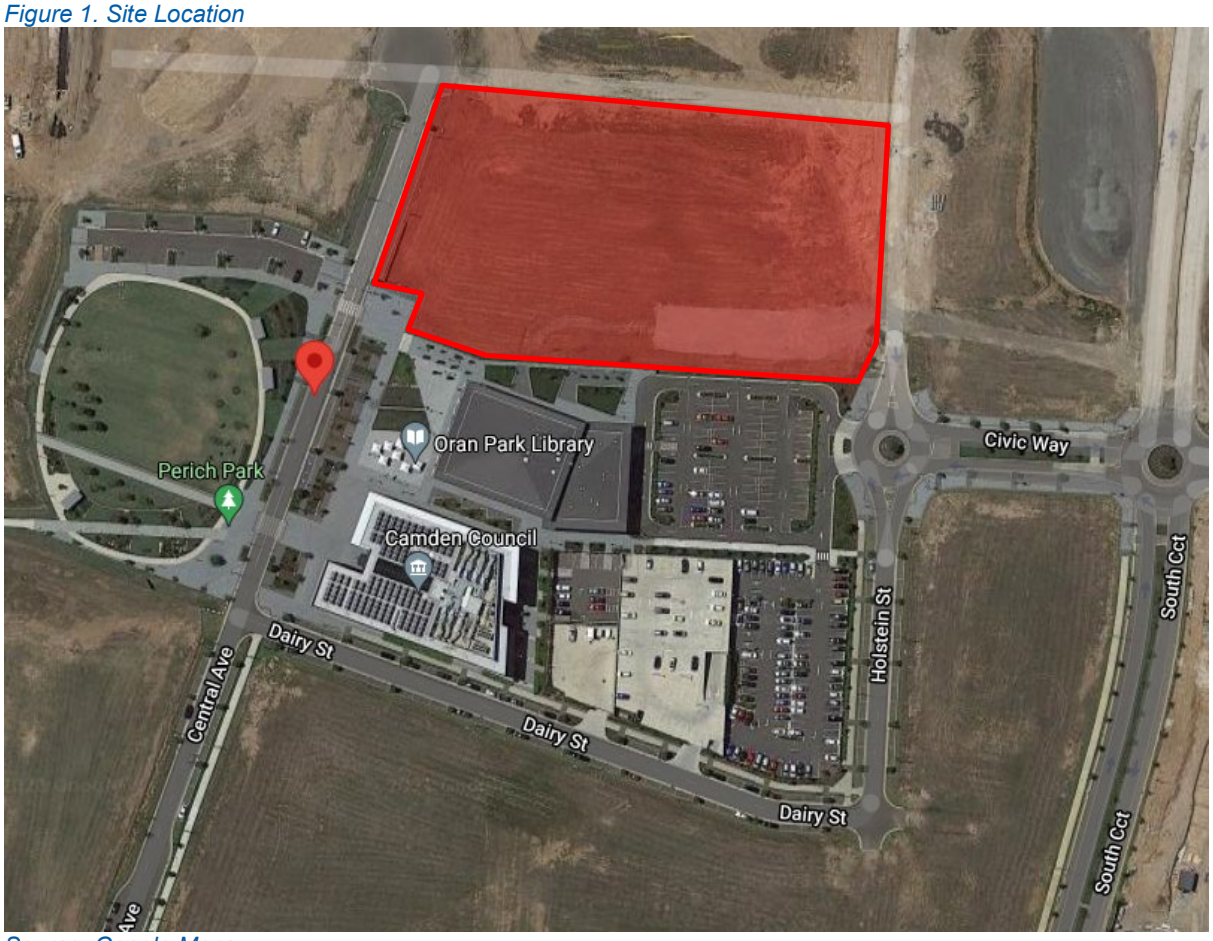
The proposed development is one (1) building with two (2) levels (Lower Ground and Ground) and falls under the LGA of Camden Council. The development will be a multipurpose community facility consisting of aquatic, indoor sports, health and fitness, a crèche, and public café. It will assist to provide unification between the existing Library and Camden Council Building, as indicated in Figure 1.

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

3.1 SITE LOCATION

The site is located at 74 Central Avenue, Oran Park NSW 2570, as shown in Figure 1 (boundaries are indicative only). The site has frontage to Central Avenue, Holstein Street, and a new road. Vehicular access is via the new road, with a loading dock also located via Holstein Street.

Figure 1. Site Location



Source: Google Maps

4.0 WASTE MANAGEMENT

The following section outlines best practice waste management, including waste generation estimates and waste disposal and collection procedures.

4.1 WASTE GENERATION ESTIMATES

Council's *Waste Management Guideline 2019* and the NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments 2019* have been referenced to calculate the total number of bins required for the anticipated tenants. Calculations are based on generic figures, and waste generation rates may differ according to the tenants' actual waste management practice.

The following table shows the estimated volume (L) of general waste and recyclables that will be generated by the leisure centre.

It is assumed that retail tenancies will share waste bins, the waste storage room, and the waste collection service.

The following estimates are based on a seven-day operating week.

Table 1: Estimated Waste and Recycling Volumes

Type	NLA (m^2)	General Waste Generation Rates (L/100m2/day)	Generated Garbage (L/week)	Recycling Generation Rate (L/100m^2/day)	Generated Recycling (L/week)
Café	57	180	718.2	180	718.2
Creche	68	80	380.8	80	380.8
Office	94	10	65.8	10	65.8
Gym	144	20	201.6	15	151.2
Program Rooms	299	20	418.6	15	313.95
TOTAL	**363**		**1785**		**1629.95**
Bins & Collections	General Waste Bin Size (L)		660	Recycling Bin Size (L)	360
	General Waste Bins Per Week		3	Recycling Bins Per Week	5
	General Waste Collections per Week		2	Recycling Collections per Week	1
	Total General Waste Bins Required		**2**	Total Recycling Bins Required	**5**

4.2 BIN SUMMARY

Based on the estimated waste generated by the leisure centre, the recommended bin quantities and collection frequencies are as follows:

General Waste: 2 x 660L MGBs collected **2 x weekly**

Recyclables: 5 x 360L MGBs collected **1 x weekly**

Bin sizes, quantities, and/or collection frequencies may be modified by the building manager once the proposed development is operational. Building management will be required to negotiate any changes to bins or collections with the collection service provider. Seasonal peak periods such as public and school holidays should also be considered.

4.3 WASTE DISPOSAL PROCEDURES

Tenancies will be responsible for their back of house waste management bins during daily operations. On completion of each trading day or as required, nominated staff or contracted cleaners will transport all general waste and recyclables via the stairs or lift to the Waste Room on Lower Ground and place into the appropriate collection bins (see APPENDIX A.1). Waste will not be compacted, and recyclables are not baled.

4.3.1 KITCHEN, OFFICE TEA ROOMS AND FOOD PREPARATION AREAS

Any food preparation area, including kitchens and office tea rooms will be provided with dedicated source separation bins including a general waste bin, a recycling bin and a food waste bin. Cleaners or nominated staff will be responsible for monitoring these bins and emptying them as required.

4.3.2 BATHROOMS

Washroom facilities should be supplied with collection bins for paper towels (if used). Sanitary bins for female restroom facilities must also be arranged with an appropriate contractor.

4.3.3 OFFICE ROOMS

It is recommended that office areas containing printing/photocopying equipment are supplied with bins for recycling items such as paper and ink toner cartridges. Cleaners or nominated staff are responsible for monitoring these bins and ensuring items are collected and recycled by an appropriate contractor.

4.3.4 FOOD WASTE

Premises which generate at least 50L per day of meat, seafood or poultry waste must have that waste collected daily or store in a dedicated refrigerated waste storage area/room until collected. This area must comply with AS4674.2004 – Design, construction and fit-out of food premises.

During daily operations staff will be responsible for the collection of any food waste back of house. At the end of the day, nominated staff or cleaners will bring any food waste to the central food waste area for collection. The building management will be responsible for providing either an on-site food waste processing system or food waste bins and collection service through a private contractor.

4.3.5 LIQUID WASTE

Liquid wastes such cleaning products, chemicals, paints, and cooking oil, etc., will be stored in a secure space that is bunded and drained to a grease trap in accordance with State government authorities and legislation.

4.3.6 PROBLEM WASTE

The building manager is responsible for arranging for the disposal and recycling of problem waste streams with an appropriate contractor. Problem wastes cannot be placed in general waste as they can have adverse impacts to human health and the environment if disposed of in landfill. Tenants will need to liaise with the building manager when disposing of problem waste streams.

Problem waste streams include:

- Chemical Waste
- Liquid wastes
- Toner cartridges
- Lightbulbs
- eWaste
- Batteries

4.4 WASTE COLLECTION PROCEDURES

Council will be engaged to service the waste and recycling bins per an agreed schedule. On the day of service, a Council waste collection vehicle will pause on the new road and service the bins via a wheel-in/wheel-out arrangement. The building caretaker will provide the driver with access to the Waste Room. Once the bins are serviced, the collection vehicle will continue along the new road in a forward direction.

5.0 STAKEHOLDER ROLES & RESPONSIBILITIES

The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 2: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Strata or Management	• Ensuring that all waste service providers submit monthly reports on all equipment movements and waste quantities/weights; • Organising internal waste audits/visual assessments on a regular basis • Purchasing any on-going waste management equipment or maintenance of equipment once building is operational; and • Managing any non-compliances/complaints reported through waste audits.
Building Manager or Waste Caretaker	• Coordinating general waste and recycling collections; • Cleaning and transporting bins as required; • Organising replacement or maintenance requirements for bins; • Organising, maintaining and cleaning the waste holding area; • Organising bulky goods collection when required • Investigating and ensuring prompt clean-up of illegally dumped waste materials. • Preventing storm water pollution by taking necessary precautions (securing bin rooms, preventing overfilling of bins) • Abiding by all relevant WH&S legislation, regulations, and guidelines; • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management; • Assessing any manual handling risks and preparing a manual handling control plan for waste and bin transfers; • Ensuring site safety for residents, children, visitors, staff and contractors; and • Ensuring effective signage, communication and education is provided to occupants, tenants, maintenance staff, and cleaning contractors.
Retail/Commercial Tenants	• Managing the back of house storage of generated waste and recycling during daily operation. • Correctly separating waste and recycling streams. Including bagging general waste and ensuring recyclables are not bagged. • Flattening cardboard within the recycling bin. • If required, making arrangements for storing used and unused cooking oil in a bunded storage area, • Organizing grease interceptor trap servicing, • Ensure dry basket arrestors are provided to the floor wastes in the food preparation, and • Ensuring the suitable storage for chemicals, pesticides and cleaning products waste back of house.
Waste Collection Contractor	• Provide a reliable and appropriate waste collection service; • Provide feedback to building managers/residents regarding contamination of recyclables; and • Work with building managers to customise waste systems where possible.
Gardening/ Landscaping Contractor	• Removal of all garden organic waste generated during gardening maintenance activities for recycling at an offsite location.
Developer	• Purchasing all equipment required to implement this OWMP prior to the occupation of the building to be provided to the strata.

6.0 SOURCE SEPARATION

Better practice waste management includes the avoidance, reuse, and recovery of unwanted items, which can be achieved through source separation. The table below outlines what is typically included in various waste streams and how they can be managed. Refer to your local council for a list of accepted materials. Planet Ark can be accessed online to find other facilities that recover unwanted items.

Table 3: Operational Waste Streams

Waste Stream	Description	Typical Destination	Waste Stream Management
General Waste	The remaining portion of the waste stream that is not recovered for re-use, processing, or recycling. May include soft plastics, food scraps, polystyrene, etc.	Landfill	Waste should be bagged before placing in the designated waste bins.
Paper and Cardboard Recyclables	Cardboard and paper products are recyclable materials that can be re-processed into new products.	Resource Recovery Centre	Cardboard should be flattened before placing in the designated cardboard bin.
Commingled Recyclables	A mixture of items that are commonly recycled usually segregated through a MRF. Typically include food and beverage containers (e.g. aluminium, glass, steel, hard plastics, cartons).	Materials Recovery Facility (MRF)	Commingled recyclables must not be bagged, and instead should be placed loosely in the designated recycling bins.
Green Waste	Green waste consists of unwanted organic materials that are easily biodegradable and/or compostable (e.g. lawn clippings, branches)	Resource Recovery Centre	Landscape Maintenance Contractors will remove the green waste from site during scheduled maintenance.
Food Waste	Food waste consists of unwanted or uneaten kitchen scraps that are easily compostable/biodegradable (e.g. vegetable peels, fruit rinds, coffee grounds).	Composting facility or Landfill	Food waste can be composted on-site, off-site, or else included in the general waste stream.
Electronic Waste	Discarded e-waste, electronic components and materials such as computers, mobile phones, keyboards, etc.	Resource Recovery Centre	Building manager arranges collection for e-waste recycling as needed by residents. Commercial tenants arrange for recycling of their own e-waste.
Bulky Items	Items that are to too large to place into general rubbish collection. This includes disused and/or broken furniture, white goods, etc.	Resource Recovery Centre or Landfill	Commercial tenants are responsible for removal of their bulky items.
Sanitary Waste	Feminine hygiene waste generated from female bathrooms.	Incineration or Landfill	Sanitary bins are serviced by sanitary waste contractor.
Other	Other recyclable items that require special recovery may include ink cartridges, batteries, chemical waste, fluorescent tubes, etc.	Resource Recovery Facility	Building manager arranges collection by appropriate recycling services when required.

7.0 EDUCATION

Educational materials encouraging correct separation of general waste and recyclables must be provided to each tenant. This should include the correct disposal process for bulky waste such as old furniture, large discarded items, and other materials including electronic and chemical wastes. It is recommended that the building caretaker provides information in multiple languages to support correct behaviours, and to minimise the possibility of contamination in communal waste bins.

Opportunity also exists to extend education to visitors by activating public spaces through education, promotion and community engagement. Sustainability Victoria's *Public Place Recycling Toolkit 2013* is a useful resource for how to implement a successful public place recycling strategy.

7.1 SIGNAGE

Signage and education are essential components to support best practice waste management including resource recovery, source separation, and diversion of waste from landfill.

Signage should include:

- Clear and correctly labelled waste and recycling bins,
- Instructions for separating and disposing of waste items. Different languages should be considered,
- Locations of, and directions to, the waste storage areas with directional signs, arrows, or lines,
- The identification of all hazards or potential dangers associated with the waste facilities, and
- Emergency contact information should there be issues with the waste systems or services in the building.

The building manager is responsible for waste room signage including safety signage. Appropriate signage must be prominently displayed on doors, walls and above all bins, clearly stating what type of waste or recyclables is to be placed in each bin.

All signage should conform to the relevant Australian Standards.

7.2 POLLUTION PREVENTION

Building management shall be responsible for the following to minimise dispersion of site litter and prevent stormwater pollution to avoid impact to the environment and local amenity:

- Promoting adequate waste and recycling disposal into the bins
- Securing all bin rooms (whilst affording access to staff/contractors)
- Prevent overfilling of bins, keep all bin lids closed and bungs leak-free
- Taking action to prevent dumping or unauthorised use of waste areas
- Require collection contractor/s to clean up any spillage when clearing bins

8.0 WASTE ROOMS

The areas allocated for waste storage and collection areas are detailed in the table below, and are estimates only. Final areas will depend on room and bin layouts.

Table 4: Waste Room Areas

Level	Waste Room Type	MGBs	Estimated Area Required (m^2)	Actual Area Provided (m^2)
LG	Waste Room	2 x 660L MGB general waste 5 x 360L MGB recyclables	19	21

The waste room areas have been calculated based on equipment requirements and/or bin dimensions with an additional 70% of bin GFA factored in for manoeuvrability.

In addition, all doorways and passageways facilitating the movement of bins and/or bulky waste items must be at least 1800mm wide per Council's DCP. The following table provides further waste room requirements.

Table 5: Waste Room Requirements

Waste Room Type	Waste Room Requirements
Waste Room	• Bins should be arranged so that all bins are accessible. Bins are not be placed in front another or in such away as to restrict access to the other bins for use.

9.0 BIN MOVING PATHS

The building caretaker is responsible for the transportation of bins as required from their designated operational locations to the bin holding room as required and returning them once emptied to resume operational use.

Transfer of bins should minimise manual handling where possible, as bins become heavy when full. The building manager must assess manual handling risks and provide any relevant documentation to key personal.

The routes along the bin moving path should;

- Be at least 1600mm wide.
- Allow for a continuous route that is wholly within the property boundary.
- Be free from obstruction and obstacles such as steps and kerbs.
- Be constructed of solid materials with a non-slip surface.
- Be a minimum of 300mm wider than the largest bin used onsite.
- If bins are moved manually, the route must not exceed a grade of 1:14.
- If a bin moving device is used, the route cannot exceed the maximum operating grade of the device. This is typically a grade of 1:4, however this will vary depending on the model of bin moving device acquired for the site.

The developer is responsible for suppling all equipment required for moving bins this includes any bin lifters, bin moving devices and waste transfer bins. This equipment must be new and appropriate for the site. The developer should contact a bin-tug, trailer or tractor consultant to provide equipment recommendations.

Once the site is operational (and the developers is no longer involved) the building proprietors/strata will be responsible for maintaining, repairing and replacing waste management equipment.

9.1 CONSTRUCTION REQUIREMENTS

Waste room construction must comply with the minimum standards as outlined in the *Camden Waste Management Guideline 2019,* in order to minimise odours, deter vermin, protect surrounding areas, and make it a user-friendly and safe area.

The *NSW Better Practice Guide for Resource Recovery in Residential Developments (2019)* also states that better practice bin storage areas should achieve more than the minimum compliance requirements, which are as follows:

- Ensuring BCA compliance, including ventilation. Where required, ventilation system must comply with AS1668.4-2012 The use of ventilation and air conditioning in buildings.
- Ensuring storage areas are well lit (sensor lighting preferred) and have lighting available 24 hours a day.
- Provision of bin washing facilities, including taps for hot and cold water provided through a centralised mixing valve. The taps must be protected from bins and be located where they can be easily accessed even when the area is at bin capacity.
- Floor constructed of concrete at least 75mm thick.
- Floor graded so that any water is directed to a sewer authority approved drainage connection to ensure washing bins and/or waste storage areas do not discharge flow into the stormwater drain.
- Provision of smooth, cleanable and durable floor and wall surfaces that extend up the wall to a height equivalent to any bins held in the area.
- Ensuring ceilings are finished with a smooth-faced non-absorbent material capable of being cleaned.
- All surfaces (walls, ceiling and floors) finished in a light colour.

10.1.1 ADDITIONAL CONSIDERATIONS

- Waste room floor to be sealed with a two-pack epoxy;
- All corners coved and sealed 100mm up, this is to eliminate build-up of dirt;
- Tap height and light switch height of 1.6m;
- Storm water access preventatives (grate);
- All walls painted with light colour and washable paint;
- Equipment electric outlets to be installed 1700mm above finished floor level;
- Optional automatic odour and pest control system installed
- If 660L or 1100L bins are utilised, 2 x 820mm (minimum) double-doors must be used;
- All personnel doors are hinged, lockable and self-closing;
- Conform to the Building Code of Australia, Australian standards and local laws; and
- Childproofing and public/operator safety shall be assessed and ensured
- Waste and recycling rooms must have their own exhaust ventilation system either;
    - Mechanically - exhausting at a rate of 5L/m² floor area, with a minimum rate of 100L/s minimum; Mechanical exhaust systems shall comply with AS1668.4.2012 and not cause any inconvenience, noise or odour problem or
    - Naturally - permanent, unobstructed, and opening direct to the external air, not less than one-twentieth (1/20) of the floor area.

11.0 USEFUL CONTACTS

EFRS does not warrant or make representation for goods or services provided by suppliers.

LOCAL COUNCIL

Camden Customer Service	Ph: (02) 4654 7777	E: mail@camden.nsw.gov.au

PRIVATE WASTE COLLECTION PROVIDER

Capital City Waste Services	Ph: 02 9599 9999	E: service@ccws.net.au
Remondis	Ph: 02 9032 7100	
Suez Environmental	Ph: 13 13 35	
Wastewise NSW	Ph: 1300 550 408	E: admin@wastewise.com.au

ORGANIC DIGESTERS AND DEHYDRATORS

Closed Loop	Ph: 1300 762 166	
Orca		E: contact.australia@feedtheorca.com
Soil Food	Ph: 1300 556 628	
Waste Master	Ph: 1800 614 272	E: hello@wastemasterpacific.com.au

COOKING OIL CONTAINERS AND DISPOSAL

Auscol	Ph: 1800 629 476	E: sales@auscol.com

ODOUR CONTROL

Purifying Solutions	Ph: 1300 636 877	E: sales@purifyingsolutions.com.au

SOURCE SPERATION BINS

Source Separation Systems	Ph: 1300 739 913	E: info@sourceseparationsystems.com.au

MOBILE GARBAGE BINS, BULK BINS AND BIN EQUIPMENT

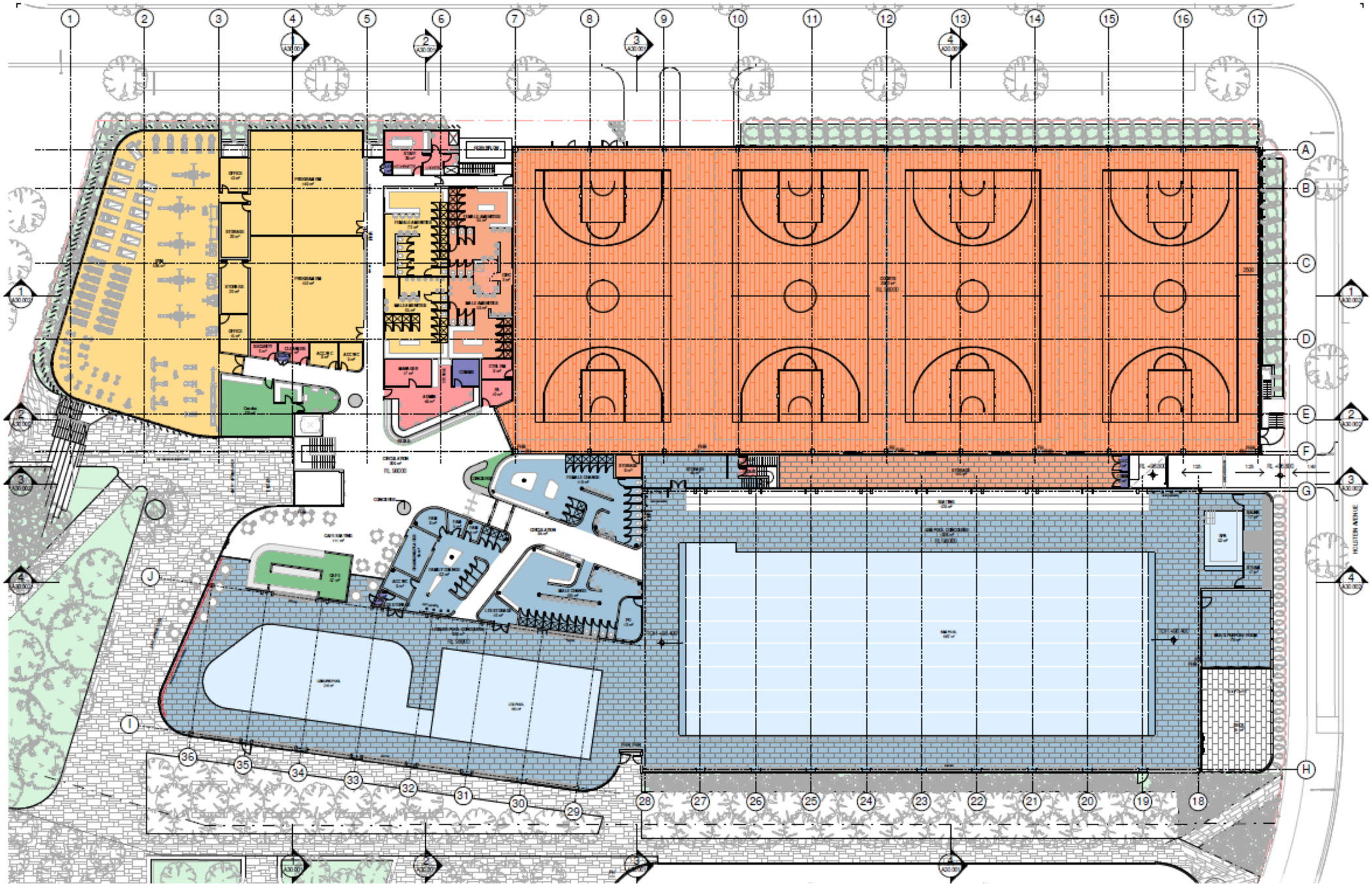
SULO	Ph: 1300 364 388	E: sales@sulo.com.au
OTTO Australia	Ph: 02 9153 6999	

CHUTES, COMPACTORS AND EDIVERTER SYSTEMS

Elephants Foot Recycling Solutions	Ph: 1800 025 073	E: info@elephantsfoot.com.au

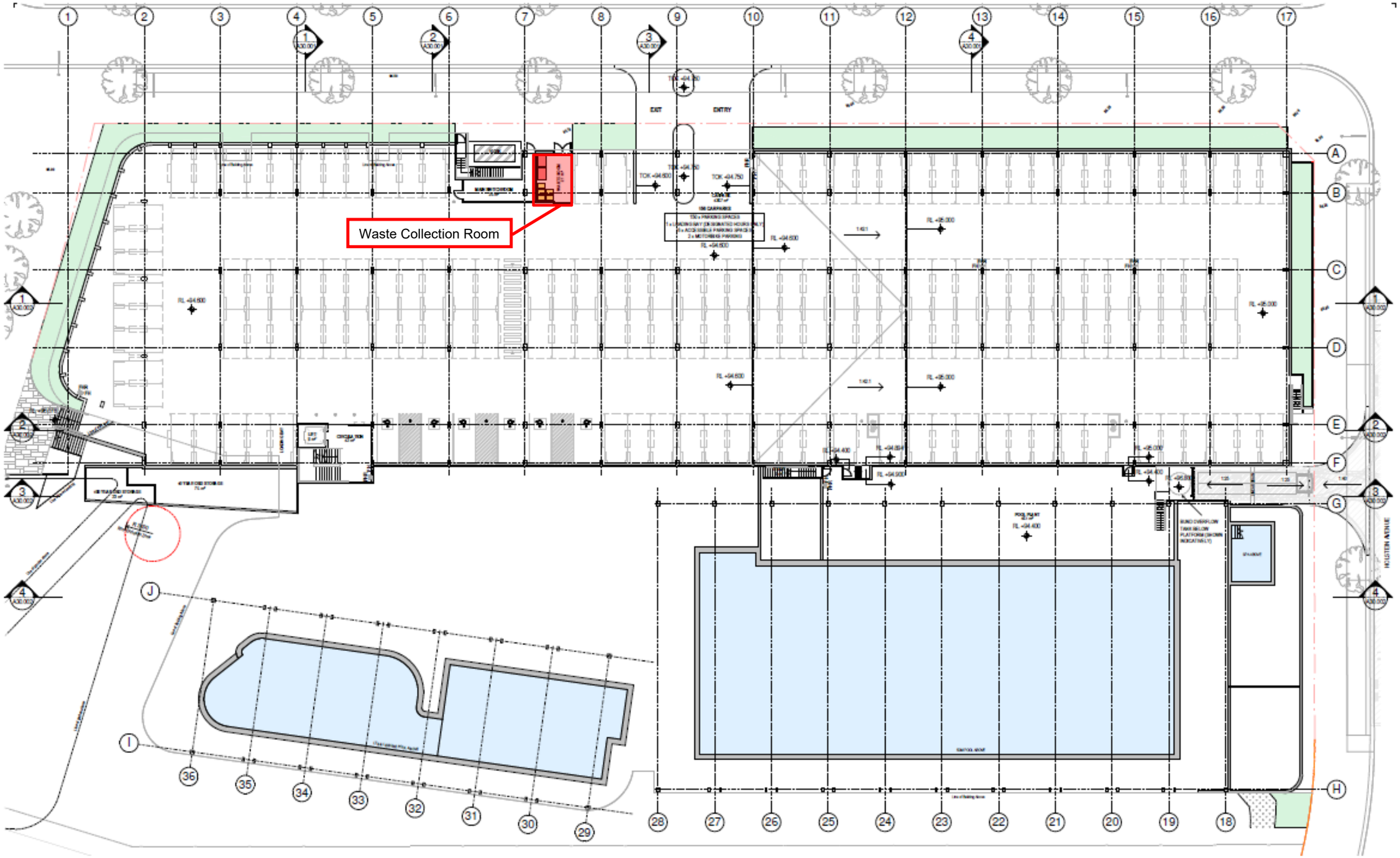
APPENDIX A: ARCHITECTURAL PLANS

APPENDIX A.1 GROUND FLOOR PLAN



Source: Warren and Mahoney Architects Australia Pty Ltd, Drawing No A10.002, Ground Floor Plan, 10.05.2021

APPENDIX A.2 LOWER GROUND FLOOR PLAN



Source: Warren and Mahoney Architects Australia Pty Ltd, Drawing No A10.001, Lower Ground Floor Plan, 08.06.2021

APPENDIX B: PRIMARY WASTE MANAGEMENT PROVISIONS

APPENDIX B.1 TYPICAL BIN SPECIFICATIONS

Mobile bins

Mobile bins come in a variety of sizes and are designed for lifting and emptying by purpose-built equipment.

Mobile bins with capacities of up to 1700L must comply with *AS4123.6-2006 Mobile waste containers* which specifies standard sizes and sets out the colour designations for the bodies and lids of mobile waste containers indicating the type of materials they are used to collect.

The most common bin sizes are provided below, although not all sizes are shown. The dimensions are a guide only and differ slightly between manufacturers. Some bins have flat or domed lids and are used with different lifting devices. Refer to *AS4123.6-2006* for further details.

Table G1.1: Average dimension ranges for two-wheel mobile bins

Wheelie bin

Bin capacity	80L	120L		140L		240L	360L
Height (mm)	870	940	1065	1080	1100		
Depth (mm)	530	530		540		735	820
Width (mm)	450	485		500		580	600
Approximate footprint (m^2)	0.24	0.26–0.33		0.27-0.33		0.41–0.43	0.49
Approximate weight (kg)	8.5	9.5		10.4		15.5	23
Approximate maximum load (kg)	32	48		56		96	Not known

Sources include Sulo, Single Waste, Cleanaway, SUEZ, just wheelie bins and Perth Waste for two-wheel mobile bins

Table G1.2: Average dimension ranges for four-wheel bulk bins

Dome or flat lid container

Bin capacity	660L	770L	1100L	1300L	1700L
Height (mm)	1250	1425	1470	1480	1470
Depth (mm)	850	1100	1245	1250	1250
Width (mm)	1370	1370	1370	1770	1770
Approx footprint (m^2)	0.86–1.16	1.51	1.33–1.74	2.21	2.21
Approx weight (kg)	45	Not known	65	Not known	Not known
Approx maximum load (kg)	310	Not known	440	Not known	Not known

Sources include Sulo, Signal Waste, Cleanaway, SUEZ, Just Wheelie Bins and Perth Waste

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX B.2 SIGNAGE FOR WASTE & RECYCLING BINS

Waste signs

Signs and educational materials perform several functions including:

- informing residents why it is important to recover resources and protect the environment
- providing clear instructions on how to use the bins and services provided
- alerting people to any dangers or hazards within the bin storage areas.

All waste, recycling and organic bins should be Australian Standard colours and clearly and correctly labelled, such as by a sticker on the lid and/or the body of the bin.

Communal bin storage areas should be clearly signposted with signs outlining how to correctly separate waste into the bins provided. The local council responsible for waste services may be a good source of signs and posters and can advise on what signs are suitable.

Information on who to contact to find out more about the recycling and/or other resource recovery services in the building should also be displayed in communal areas, such as on a noticeboard.

The Planet Ark website also has resources available free of charge for use by businesses and councils. These signs can be found at businessrecycling.com.au/research/signage.cfm

Figure I1.1: Examples of waste wall posters (EPA supplied)

Figure I1.2: Examples of bin lid stickers (EPA supplied)

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Problem waste signs

The EPA has also produced a range of images and signs that can be used for problem wastes, such as fluoro globes and tubes, household and car batteries, e-waste and smoke detectors. To access these resources, contact the NSW EPA. Some examples are shown below.

Figure I2.1: Problem waste signs

Safety signs

The use of safety signs for waste resource recovery rooms must comply with *AS1319 Safety signs for occupational environments*. Safety signs must be used to regulate and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Suitable signs should be decided for each development as required.

Figure I3.1: Example safety signs

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX B.3 TYPICAL COLLECTION VEHICLE INFORMATION

General

Appropriate heavy rigid vehicle standards should be incorporated into the road and street designs in new developments where onsite collections are proposed. Road and street designs must comply with relevant Acts, regulations, guidelines, and codes administered by Austroads, Standards Australia, NSW Roads and Maritime Services, WorkSafe NSW and any local council traffic requirements.

Applicants and building designers should consult with councils and other relevant authorities before designing new roads or streets and access points for waste collection vehicles to establish specific design requirements.

Table H4.1: Australian Standards for turning circles for medium and heavy rigid class vehicles

Vehicle class	Overall length (m)	Design width (m)	Design turning radius (m)	Swept circle (m)	Clearance (travel) height (m)
Medium rigid vehicle	8.80	2.5	10.0	21.6	4.5
Heavy rigid vehicle	12.5	2.5	12.5	27.8	4.5

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

Large collection vehicles

Waste collection vehicles may be side-loading, rear-loading, front-lift-loading, hook or crane lift trucks. Vehicle dimensions vary by collection service, manufacturer, make and model. It is not possible to provide definitive dimensions, so architects and developers should consult with the local council and/or contractors.

The following characteristics represent typical collection vehicles and are provided for guidance only. Reference to *AS2890.2 Parking facilities: off-street commercial vehicle facilities* for detailed requirements, including vehicle dimensions, is recommended.

Table B2.1: Collection vehicle dimensions

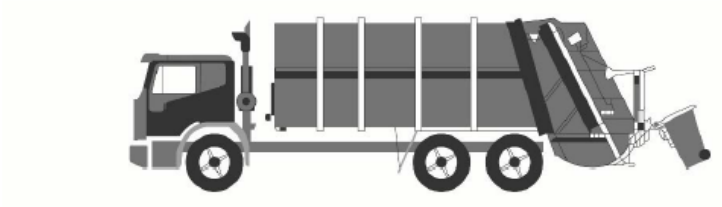
Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Operational height for loading (m)	3.9	4.2	6.5	3.0	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	13.0
Maximum payload (t)	10.0	10.8	11.0	14.5	9.5
Turning circle (m)	25.0	21.4	25.0	25.0	18

* The maximum reach of a side arm is 3 m.

Sources: JJ Richards, SUEZ, MacDonald Johnson, Cleanaway, Garwood, Ros Roca, Bingo and Edbro. Figures shown represent the maximum dimensions for each vehicle type.

Rear-loading collection vehicles

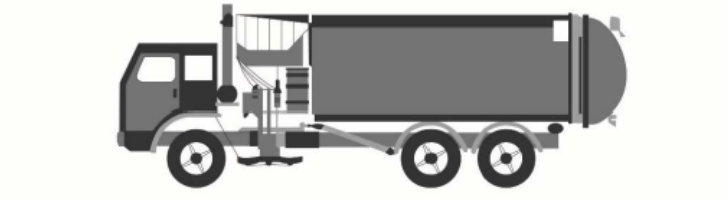
These vehicles are commonly used for domestic waste collections from MUDs and RFBs and sometimes for recycling. They can be used to collect waste stored in mobile bins or bulk bins, particularly where bins are not presented at the kerbside. They are also used for collecting bulky waste.



Rear-loading waste collection vehicle

Side-loading collection vehicles

This is the most commonly used vehicle for domestic waste, recycling and organics collections. It is only suitable for collecting mobile bins up to 360L in capacity.



Side-loading waste collection vehicle

Front-lift-loading collection vehicles

These vehicles are commonly used for collecting commercial and industrial waste. They can only collect specially designed front-lift bulk bins and not mobile bins.

Front-lift-loading waste collection vehicle

Small collection vehicles

Typically, councils and their contractors operate with large collection vehicles (heavy rigid class vehicles) because they carry greater payloads and allow for more cost-effective collection services. Some councils, or their contractors, may have smaller collection vehicles in their fleet. Early discussion with the council is important to confirm this, but it should not be assumed that the council will have access to small collection vehicles.

The waste management systems and the location of the collection point should always be designed so that the council can provide the standard domestic waste service.

SOURCE: Better Practice Guide For Resource Recovery In Residential Developments 2019, NSW Environmental Protection Authority

APPENDIX C: SECONDARY WASTE MANAGEMENT PROVISIONS

APPENDIX C.1 TYPICAL WORM FARM SPECIFICATIONS

Worm farms

Worm farms or vermiculture systems transform food and other organic material into vermicast (worm compost) and vermi-liquid (liquid extraction from a worm farm). Seafood, seafood shells, meat or bones, and dairy products are not an acceptable part of the worms' diet and should not be appled to these systems. Worm farms can occupy a small footprint and be located on balconies or in gardens. The worm farm should be placed in a sheltered position to avoid getting too hot in summer.

Worm farms come in different sizes and designs and are sold through hardware stores and often at local government offices. Medium and large-scale worm farms can service many households and commercial acticities. These larger systems need a management process to ensure they are properly maintained.

Onsite composting

Compost tumblers and bins and compost bays transform food and other organic material into useful soil enhancer (compost). They are more versatlie than worm farms as they can generally process a wider range of materials, including woody garden organics and can be placed in the sun. A variety of compost bins and tumblers are available from hardware stores or some local councils. There are also various online resources on how to construct them using recycling materials such as timber pallets. The footprint area requirement for a typical single household compost bin is about 1m x 1m x 1m.

Before setting up an onsite composter or worm-farm system, check with council for any local requirements such as setback distances from property boundaries.

SOURCE: Better practice guide for resource recovery in residential developments 2019, NSW Environmental Protection Authority

APPENDIX C.2 TYPICAL COOKING OIL CONTAINERS

Drums 205L

Pour in Bulk Tank

View Brochure

Oil Kaddy System

View Brochure

Eco Systems

Direct-Connect to Fryer

SOURCE: http://www.auscol.com/services/collection-systems/

APPENDIX C.3 TYPICAL SOURCE SEPARATION BINS FOR RETAIL/COMMERCIAL USE

SOURCE: https://www.sourceseparationsystems.com.au/