ARUP

Elanor Investors Group

Tweed Heads Mall Development Concept Plan

Waste Management Strategy Report

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1. Introduction

1.1 Project Overview

Arup has been engaged by Elanor Investors Group to provide a Waste Management Strategy Report for the proposed concept development application of the existing Tweed Mall Shopping Centre, located in Tweed Heads. The development of the site would see the transformation of the current site into a mixed-use residential and commercial and retail precinct, consisting of a centralised multi-storey retail building bordered by a number of residential and commercial towers. The development would consist of 3 lots (see Figure 1), which are proposed for staged development with Lot 1 being completed first.

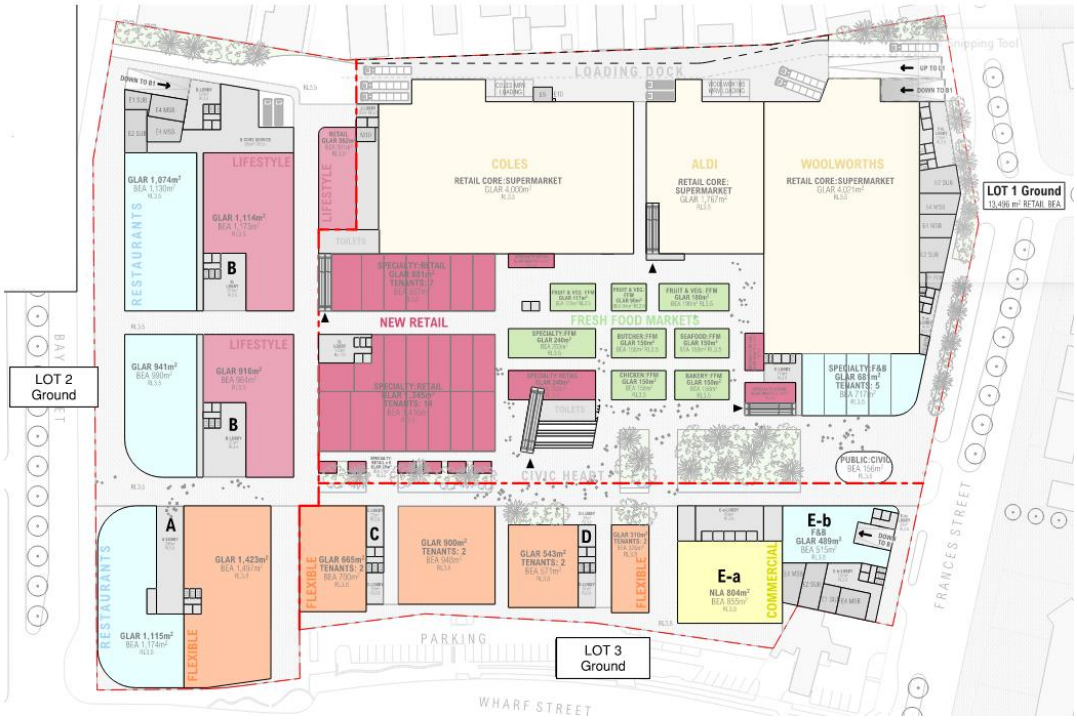

Figure 1 Proposed development ground floor Illustrating Lot sections (adapted from drawing A-DA-103 Revision F).

1.2 Purpose of Waste Management Strategy Report

A masterplan for the development has been prepared by CHROFI, and this Waste Management Strategy Report (WMSR) aims to support the current master planning exercise and further design, as well as subsequent engagement with Tweed Shire Council regarding a development application for the project. This WMSR covers only operational waste management and does not include details regarding the management of waste and recycling in the demolition and construction phases of development. This WMSR intends to outline waste and recycling streams to be generated, estimate generation volumes, and provide a high-level description of the waste and recycling management systems. Considering:

- Quantitative waste generation estimates by type of material for each major area use of the development during operation
- Interim and central waste storage requirements, including area requirements, number of bins, and associated waste management equipment needed for operation of the development
- Internal movement of waste and recycling streams
- Servicing requirements including vehicle access requirements

- Options to minimise waste generation, encourage resource recovery, and implement circular economy practices
- Relevant planning requirements and assessment frameworks, such as the Green Star certification tool.

A Waste Management Plan is to be developed as the design and planning progress to satisfy the requirements outlined in the Tweed Shire Council's *Development Control Plan Section A15 Waste Minimisation and Management.*

2. Legislative Requirements, Standards and Guidelines

The following standards, state legislation and council planning requirements are of relevance to the development:

- Australian Standard, Parking facilities, Part 2: Off-street commercial vehicle facilities 2002 (AS 2890.2:2018)
- Australian Standard, Mobile waste containers (AS4123.1 – AS4123.7)
- Building Code of Australia
- New South Wales: Protection of the Environment Operations Act, 1997 (POEO Act)
- New South Wales: Waste Avoidance and Resource Recovery Act, 2001 (WARR Act)
- New South Wales EPA: Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities, 2012
- Tweed Shire Council Development Control Plan Tweed City Centre
- Tweed Shire Council Development Control Plan Section A15 Waste Minimisation and Management.

For the purposes of this WMSR, particular attention has been given to the Development Control Plans published by Tweed Shire Council, to ensure the minimum expectations of Council are achieved for any waste management system implemented for the proposed development. Where gaps were encountered in the guides published by Tweed Shire Council, the City of Sydney *Guidelines for Waste Management in New Developments* (2018) and City of Melbourne *Guidelines for Waste Management Plans* (2021) were relied upon as examples of best practice in waste management planning.

2.1 Tweed Shire Council Development Control Plan Section A15 Waste Minimisation and Management.

Given the mixed-use nature of the proposed development, both municipal solid waste (MSW) and commercial and industrial (C&I) waste would be generated by the development. As the basis for any waste services Tweed Shire Council through their Development Control Plan (DCP) for Waste Minimisation and Management requires the following high-level controls[1] to be implemented for a mixed-use development:

- Residents:
  - Sufficient space to accommodate indoor waste and recycling cupboards (or other appropriate storage space) for each dwelling

[1] Those controls which are more detailed, such as types of surfaces to be used in waste storage rooms, form of doors or gates to waste storage rooms, signage and site management have been excluded from this list for ease of review, but will need to be addressed as part of final development application approval.

- A communal waste and recycling storage room(s) able to accommodate general waste, commingled recyclables, and green waste bins, located in the basement which is designed to minimise adverse impacts associated with:
  - The proximity of the room to any dwellings
  - The visibility of the room
  - Noise generated by any equipment located within the room
  - Noise generated by the movements of bins into and out of the room
  - Noise generated by collection vehicles accessing the site; and
  - Odours emanating from the room.
- The waste and recycling storage area(s) or room(s) must be of a size that can comfortably accommodate and manoeuvre separate general waste, commingled recycling, and green waste bins
- For multi-storey developments which include ten or more dwellings, a dedicated room or caged area must be provided for the temporary storage of discarded bulky items which are awaiting removal. The storage area must be readily accessible to all residents and must be located close to the main waste storage room or area
- Service rooms and storage areas must be located for convenient access by users, and must be well ventilated and well lit; and
- Provision of cold water supply to residents for the cleaning of bins and the waste storage areas, with wastewater discharged to sewer.

- Commercial tenants
  - Provision of a designated waste and recycling storage area or room(s), the location and design of which should minimise adverse impacts associated with:
    - The proximity of the area to any dwellings
    - The visibility of the area
    - Noise generated by any equipment located within the area
    - Noise generated by the movements of bins into and out of the room
    - Noise generated by collection vehicles accessing the site; and
    - Odours emanating from the area.
  - Waste and recycling storage areas must be adequately sized to comfortably accommodate all general waste and recycling bins associated with the development
  - Convenient access from each tenancy to the waste and recycling storage room(s) or area(s) needs to be provided, including step-free access between the point at which bins are collected or emptied, and the waste and recycling storage room(s) or area(s)
  - Designed to allow access by waste collection vehicles used by the nominated waste contractor; where possible, the site configuration should allow waste collection vehicles to enter and exit the site in a forward direction to avoid impeding general access to, from and within the site
  - Provision of hot and cold water for cleaning of bins or waste storage area(s), with wastewater discharged to an approved drainage connection located upon the site
  - Waste management facilities must be suitably enclosed, covered and maintained so as to prevent polluted wastewater runoff from entering the stormwater system

- Where possible, waste and recycling containers should be collected from a rear lane access point, and consideration should be given to the time of day at which containers are collected so as to minimise adverse impacts upon residential amenity, pedestrian movements, and vehicle movements
- Provision of a waste and recycling cupboard for each and every kitchen area in the development
- Premises which generate at least 50 litres per day of meat, seafood or poultry waste must have that waste collected on a daily basis or must store that waste in a dedicated and refrigerated waste storage area until collection.

2.2 Green Star

The aspirations of Elanor Investors Group to achieve a 5-Star Green Star building rating for the Tweed Mall development are recognised by this WMSR. Waste management falls under the category 'Responsible Resource Management', and meeting the criteria shown in Table 1 can help earn four credits towards the overall Green Star rating. These criteria are considered the 'minimum expectation', in that all Green Star buildings should meet these base criteria irrespective of final rating. These requirements have been taken into consideration when setting minimum requirements for the proposed development.

Table 1 Green Star Responsible Resource Management Criteria

Criteria	Description

Collection of Waste Streams	The building must provide bins or storage containers to building occupants to enable them to separate their waste. These bins must be labelled and easy to access, and evenly distributed throughout the building. They must also allow for separating the following as a minimum:
	– General waste going to landfill
	– Recycling streams to be collected by the building's waste collection service, including
	  – Paper and cardboard
	  – Glass
	  – Plastic
	– One additional waste stream identified by the project team. This may include collecting any of the following waste types: organics, e-waste, batteries, etc.
	Any other single waste stream (except food waste) that is expected to represent more than 5% of total annual operational waste and resources (by volume) must also be included.

Dedicated Waste Storage Area	A dedicated area, or areas, for the storage and collection of the applicable waste streams must be provided. The storage area must be sized to accommodate all bins or containers for all applicable waste streams, for at least one collection cycle. The calculations used to demonstrate that the area provided is adequately sized to handle the recyclable waste streams specified must be based on: – Forecasted waste generated by occupants – Collection frequency for each waste stream The calculations for waste generation rates must be based on figures outlined within third-party best practice guidelines (such as the City of Sydney's *Guidelines for Waste Management in New Developments*). The storage area(s) must have efficient and safe access by collection vehicles. This includes driveway access to the building, appropriate height clearances, any onsite roads and loading docks, and the storage areas themselves providing safe and easy access for bins to be emptied into collection vehicles.
Sign-off by Waste Specialist and/or Contractor	A waste specialist and/or contractor must sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.

3. Operation

3.1 Area Use

The areas of interest to this WMSR in the proposed development comprise the commercial/retail premises, hotel, restaurants, food and beverage space, and residential accommodation. Indicative floor areas were gathered from the coordination set of drawings for the Tweed Mall Master Plan produced by CHROFI and issued to Arup on 2nd November 2022. Exact drawings used are listed in Table 2.

Table 2 Drawing numbers, titles and revisions used in the development of this waste strategy.

Drawing number	Title	Revision
A-DA-102	PLAN - BASEMENT 01	E
A-DA-103	PLAN - GROUND	F
A-DA-104	PLAN - MEZZANINE	E
A-DA-105	PLAN - LEVEL 01	E
A-DA-106	PLAN - LEVEL 02	E
A-DA-107	PLAN - LEVEL 03	E
A-DA-108	PLAN - TYPICAL TOWER	E
A-DA-109	PLAN - ROOF	E
A-DA-301	SECTION - SITE	E
A-DA-403	TYPICAL BUILDING SECTIONS	A

How an area will be utilised will influence the volume of waste that may be expected to be generated within that area. In the first instance, waste generation rates relevant to the type of area ('premise typology') proposed in the concept development application have been sourced from the Tweed Shire Council DCP. Where the Tweed Shire Council DCP does not provide waste generation rates for certain premise typologies, guidance has been sought from other DCPs or guidelines. As they are accepted as being representative of best practice for waste planning, Arup have filled any gaps in the Tweed Shire Council DCP with the requirements of the City of Sydney and City of Melbourne guidelines. The approach adopted by Arup is shown in Table 3 below, which identifies the planning guideline a particular premise typology (and associated waste generation rate) was sourced from. Floor areas were taken from the drawings shown in Table 2, which consisted of a combination of lettable areas and BEA[2], which were used to estimate waste generation per premise type.

Table 3 Area uses, equivalent premise type as defined by council waste guidelines and the total indicative floor area for the proposed development.

Area Use	Premise Type	Floor Area (m^2)
"Restaurants"; "Speciality F&B"; "F&B"	Restaurant, Café (*Tweed Shire Council*)	6,643
"Lifestyle"; "Flexible"; "Medical: Retail"; "Wellness: Retail"; "Speciality: Retail"; "Retail"	Shop (>100m^2) (*Tweed Shire Council*)	13,671
"Retail Core: Supermarket"	Supermarket (*Tweed Shire Council*)	9,788
"Fruit & Veg: FFM"	Greengrocer (*Tweed Shire Council*)	387
"Butcher: FFM"; "Chicken: FFM"	Butcher (*Tweed Shire Council*)	300
"Seafood: FFM"	Fish Shop (*Tweed Shire Council*)	150

[2] The total enclosed, unenclosed, and uncovered built area of the building at all building floor levels measured between the normal outside face of any enclosing walls, balustrades and supports.

Area Use	Premise Type	Floor Area (m^2)
"Bakery: FFM"; "Speciality: FFM"	Delicatessen (*Tweed Shire Council*)	390
"Commercial"	Offices (*Tweed Shire Council*)	12,743
"Public: Lobby"	Lobby (*City of Sydney*)	156
"Childcare: Retail"	Child care centres and facilities with kitchens (*City of Sydney*)	1,976
"Entertainment"; "Cinema: Entertainment"	Entertainment venues (*City of Sydney*)	4,699
"Gym: Retail"	Gym (*City of Melbourne*)	1,620
"Hotel / Residential"	Hotels (*City of Sydney*)	3,947
	Total	**56,470**
Area Use	**Premise Type**	**Number of appartements**
Residential Apartment	Multi-unit Residential Developments (per unit) (*City of Melbourne*)	1,238

3.2 Operational Waste Streams

Based on the Green Star Building Council requirements for waste management, and the best-practice standards set by the City of Sydney guidelines and NSW EPA *Better practice guide for resource recovery in residential developments*, the waste streams addressed in the waste generation modelling include:

- Residential waste
  - Landfill
  - Commingled recycling
  - Food and organic waste
  - Bulky and problem waste
- Commercial waste
  - Landfill
  - Commingled recycling
  - Paper and cardboard
  - Food and organic waste

Beyond these minimum waste streams there is an opportunity for additional resource recovery. It is recommended that consideration be given to providing for the collection of the following waste streams in future designs.

- Container Deposit Scheme (CDS) beverage containers

- Commercially reusable items (e.g., pallets, cartons, crates, kegs, etc.)
- Commercial bulky and problem waste
- E-waste
- Cooking oil storage area for commercial food retailers to participate in reuse/recycling of cooking oil, and
- Other potential future waste streams that may grow in prominence due to changing legislation, such as soft plastics.

3.3 Operational Waste Generation

As per Section 3.2, waste generation rates for waste modelling have been primarily sourced from the Tweed Shire Council DCP. Where the Tweed Shire Council DCP did not provide waste generation rates for particular premise typologies, a waste generation rate has been used from the City of Sydney or City of Melbourne guidelines. The source of a waste generation rate (either the Tweed Shire Council DCP, or the City of Sydney or City of Melbourne guidelines) is described in Table 3 above. Table 4 below outlines the generation rates adopted by material stream.

Table 4 Waste generations rates used in modelling

Premise Type	Landfill generation (L/100m^2/day)	Recycling generation (L/100m^2/day)	Organics generation (L/100m^2/day)
Restaurant, Café	667	133	-
Shop (>100m^2)	50	50	-
Supermarket	240	240	-
Greengrocer	240	120	-
Butcher	80	50	-
Fish Shop	80	50	-
Delicatessen	80	50	-
Offices	10	10	-
Lobby	20	25	0
Child care centres and facilities with kitchens	50	50	15
Entertainment venues	100	125	30
Gym	10	10	-
Premise Type	**Landfill volume (L/unit/week)**	**Recycling volume (L/unit/week)**	**Organics volume (L/unit/week)**
Multi-unit Residential Developments (per unit)	90	120	30
Premise Type	**Landfill volume (L/room/day)**	**Recycling volume (L/room/day)**	**Organics volume (L/room/day)**
Hotels	20	25	15

3.3.1 Key assumptions

The waste streams accounted for in waste generation calculations include 'Landfill' (i.e., general waste stream), 'Organics', 'Commingled Recycling' and 'Paper & Card'. However, the waste generation rates provided in the Tweed Shire Council DCP do not provide an estimate of the volume of organic waste generated by a premises, and only provide a generation rate for landfill and commingled recycling. Because of this, it is necessary to assume as to what percentage of landfill waste is comprised of organic waste, and what percentage of this organic waste may be diverted to an organics bin. Table 5 presents the assumptions used to estimate the volume of organic waste that would be generated and captured from the proposed commercial and retail tenancies. In addition to the assumptions shown in Table 5, paper and card within commercial spaces was assumed to represent 96% of the commingled recycling stream, whilst the remainder comprised commingled recyclables.

Table 5 Values used to calculate the volume of organics generated in different tenancy types where guidelines did not provide a value[3].

Tenancy	% of landfill stream made up of Organics	% of organics in the landfill stream captured for recovery
Restaurant, Café	30%	8%
Shop (>100m^2)	16%	15%
Supermarket	28%	11%
Greengrocer	29%	11%
Butcher	28%	11%
Fish Shop	28%	11%
Delicatessen	28%	11%
Offices	30%	50%
Lobby	4%	0%
Child care centres and facilities with kitchens	16%	15%
Gym	16%	15%

3.3.2 Waste generation volumes

The GFAs, generation rates and assumptions have been applied to estimate waste and recycling generation volumes for the proposed development to determine potential area requirements for storage and collection.

Total estimated waste and recycling generation volumes, by lot, are presented in Table 6 and Table 7. Distinction is also made between waste and recycling generated in residential apartments compared to commercial and retail tenancies. As the design develops generation estimates and waste management arrangements should be reviewed to ensure that the waste and recycling management systems implemented remain suitable.

Table 6 Commercial Waste Generation Volumes

Lot	Landfill volume (L/day)	Recycling volume (L/day)	Organics volume (L/day)	Paper and Card volume (L/day)
1	37,766	6,456	2,755	29,163

[3] All assumptions as per Encycle composition data for C&I sectors in Australia (Encycle, 2013)

Lot	Landfill volume (L/day)	Recycling volume (L/day)	Organics volume (L/day)	Paper and Card volume (L/day)
2	37,951	3,832	906	5,836
3	6,657	1,053	842	3,443

Table 7 Residential Waste Generation Volumes

Lot	Landfill volume (L/day)	Recycling volume (L/day)	Organics Volume
1	5,323	7,097	1,774
2	7,084	9,446	2,361
3	3,523	4,697	1,174

4. Waste Management

The concept development application includes a waste management system that allows for the separate collection and storage of residential and commercial waste. Key considerations in the development of the waste management system for the proposed development include:

- Distance of travel for waste transfer
- Safety of path of travel for waste transfer (e.g., minimisation of pedestrian movements in trafficable areas such as carparks)
- Staging of the development, ensuring that all residents and businesses have access to storage areas and bins can be serviced; and
- Storing of bins and vehicle access servicing.

The separation of commercial and residential waste is expected to address the requirement under the Tweed Shire Council's *Development Control Plan Section A15: Waste Minimisation and Management*, which specifies that:

> "Mixed Use development must incorporate separate and self-contained waste management systems for the residential component and the non-residential component. In particular, the development must incorporate separate waste/recycling storage rooms/areas for the residential and non-residential components. Commercial tenants must be prevented (via signage and other means), from using the residential waste/recycling bins and vice versa."

Based upon this, the proposed management strategy for residential and commercial waste and recycling is described.

4.1 Residential

Residential waste will be generated in all 14 proposed buildings in the development. To reduce the movement of waste in elevators, waste chutes will be provided for use by residential tenants. To provide equitable access to waste and recycling collection services chute access will be provided on each floor alongside bins for streams which cannot be disposed of in chutes. Bins will be provided for commingled recyclables and food and organic waste, the contents of which will be manually transferred to the residential central waste storage room. The chutes will discharge into interim waste storage rooms located on Basement Level 01. Tweed Shire Council guidelines stipulate that recyclables cannot be disposed of in chutes. Therefore, landfill material is initially anticipated as the only stream suitable for use in the chute as odour issues can limit their appropriateness for food organics.

Once landfill waste is discharged from a chute into the interim waste storage room it is to be transferred to the residential central waste storage room for consolidation and collection. Further details on the storage requirements, transfer and collection of waste is provided in Sections 5, 6 & 7.

4.2 Commercial

Commercial waste and recycling will be transported from tenancies directly to a central waste storage room for commercial waste. It is expected that each commercial or retail tenancy will have sufficient space to store waste and recycling, as interim waste storage rooms for commercial waste and recycling have not been included in the concept development application.

4.3 Data Collection

High quality waste data can improve the overall level of accuracy, transparency, and confidence in waste generation rates and understanding of disposal and recycling behaviours. Data pertaining to waste generation should be collected, collated, and recorded to ensure best practice monitoring procedures to help measure progress towards achieving waste and sustainability targets. The central waste storage rooms have been sized to include bin scales, however waste data can also be collected by:

- On-site weighing of bins using a bin lifter with an integrated load cell for recording weight
- Provision of waste data from a waste collection contractor, which is usually recorded by a load cell on the waste collection vehicle when bins are emptied.

5. Waste Storage

Waste storage room area requirements have been estimated based on generation rates, assumed bin sizes, compaction ratios, service frequencies, and as per the requirements outlined by both the Tweed Shire Council Development Control Plan and Green Building Council of Australia (Green Star).

5.1 Key assumptions

- Waste and recycling generated in residential communal spaces is a proportion of the overall residential waste and recycling generated by each apartment, and therefore has been ignored in generation estimates
- Landfill, commingled recyclables, and paper and card are to be stored in 1100L bins, whilst organics are stored in 660L bins
- Area for additional empty bins to accommodate one days' worth of landfill waste (for each residential waste stream) will be included in each interim waste storage room for when full bins are transferred to the residential central waste storage room for consolidation and collection
- It is assumed that waste generation from car park areas, bike store areas, plant areas, bathrooms, lifts and associated BOH areas will be negligible and therefore have been excluded from the waste generation estimates
- Waste storage design assumes the collection of residential waste (landfill, commingled and organics) every four days
- Organic waste will be stored in a refrigerated space within each central waste storage room; and
- To allow for sufficient manoeuvring and accessibility in waste storage rooms a scaling factor of 2 has been applied to the space requirements for key components.

5.2 Chute rooms (per floor)

Space adjacent to building cores for a landfill waste chute, and the storage of commingled recyclables and food organics bins will be included on each floor of the residential towers. The design of chutes will require a supplier to be engaged to determine spatial and auxiliary requirements including ventilation. The area requirements for individual chute rooms located on each floor of a residential tower has not been estimated as is out of scope for this report and as floor layouts are likely subject to change. The area of each chute room will be dependent on the number of associated apartments on the same floor, and the service frequency of bins provided in the chute room for the temporary storage of commingled recyclables and organic waste.

5.3 Interim Storage

Landfill waste from residential tenancies will be collected in an interim waste storage room located on Basement Level 01. The total area required for the storage of residential waste in each building's interim waste storage room are outlined in Table 8.

Table 8 Estimated residential interim waste storage area required for each building

Building	Estimated residential interim waste storage area required (m^2)
Lot 1	
F-a	62
F-b	51
G	37
H	37
J	27
K	26
Lot 2	
A	67
B-a	46
B-b	46
B-c	46
Lot 3	
C	40
D	40
E-a	22
E-b	42

The interim waste storage room should be designed in accordance with *Appendix D Waste Recycling/Storage Rooms in Multi-Unit* and *Appendix F Garbage Chutes* of the Tweed Shire Council's *Development Control Plan Section A15 Waste minimisation and management*, and the *Dwellings and the Better Practice Guide for Waste Management in Multi-Unit Dwellings* published by the Department of Environment and Climate Change NSW.

5.4 Central waste storage

Two central waste storage rooms – one for residential waste and recycling, and the other for commercial waste and recycling – have been allowed for. Each central waste storage room is located adjacent to the loading dock located on the eastern side of the development, accessed via Francis Street. Commercial tenancies will transfer waste and recycling directly from the point of generation to the respective commercial central waste storage room. Residential landfill waste will be transferred from interim waste storage rooms to the residential central waste storage room. Residential commingled recycling and food organics will be transferred from a chute room (on each floor of the residential towers) directly to the residential central waste storage room.

As outlined in Section 4 the separation of residential and commercial waste must be maintained in the proposed development. Appropriate infrastructure and signage to prevent commercial tenants from using the residential waste and recycling bins (and vice versa) will be implemented.

Each central waste storage room will require organic waste to be refrigerated, unless organic waste bins are serviced in alignment with the storage time stipulated by the Tweed Shire Council DCP.

Area requirements for equipment in each central waste storage room are outlined in Table 9.

Table 9 Equipment and area required in each central waste storage room

Equipment type	Requirement	Area required (m^2)
MGBs	As required for each Lot dependent on waste generation rates.	Various
1100L In-bin compactor[4]	For the compaction of waste and recycling at each central waste storage room	5
Bin lift[5]	For the consolidation of waste and recycling at each central waste storage room	3
Scales[6]	For the collection of waste generation data at each central waste storage room	3
Bin wash	For the cleaning of bins.	8

The total estimated area required for central waste storage areas are presented in Table 10 by lot and by use.

Table 10 Estimated central waste storage area required for each lot, including consolidation, data collection compaction and bin wash equipment

Lot Number	Estimated residential central waste storage area required (m^2)	Estimated commercial central waste storage area required (m^2)	Total (m^2)
Lot 1	184	183	367
Lot 2	182	121	303
Lot 3	114	55	169

6. Waste Circulation

6.1 Residential

Landfill waste collected in interim waste storage rooms beneath residential buildings will be transported to the residential central waste storage room before collection. Responsibility for the transfer of this waste will be further defined in an operational waste management plan. As noted in Section 4, the movement of waste through a trafficable zone such as a carpark poses a risk to staff health and safety. The inclusion of the service lift to provide direct access to the residential central waste storage room from Basement Level 01 will avoid transferring bins up or down ramps. Identification of suitable risk mitigation should be undertaken in

[4] Example equipment dimensions based on WastePac 1100L bin press with compaction ratio 2:1.

[5] Example equipment dimensions based on Electrodrive Liftmaster Universal bin lift.

[6] Example equipment dimensions based on Bilanciai weighting platform

consultation with a suitably qualified professional. Residential commingled recycling and food organics will be transferred between floors and to the residential central waste storage room using the lifts included in each residential tower.

6.2 Commercial

Waste collected from commercial and retail tenancies will be transported to the commercial central waste storage room before collection. Responsibility for the transfer of this waste will be further defined in an operational waste management plan. Existing lifts in the development are expected to be used to transfer bins and waste between floors, before being transported to the commercial central waste storage room.

6.3 General

The use of mechanical aids for the transport of waste allows bins to be transported more efficiently. Mechanical aids such as bin tugs will require additional space for storage and charging when not in use, however an allowance for this space requirement has not been made in this strategy.

Transport routes for MGBs are required to be step free, and the gradient of any associated access ramps must be sufficiently level so that access for the purpose of emptying containers can occur in accordance with WorkCover NSW Occupational Health and Safety requirements. Proposed transfer routes are a requirement of an operational waste management plan and will be defined at later stages for approval.

7. Waste Collection

7.1 Collection Vehicles & Access

Central waste storage rooms are located adjacent to the loading dock situated on the eastern side of the development, accessed by Francis Street. Bins will be transferred to a collection point in or by the loading dock/central waste storage room for trucks to collect as required.

A private waste contractor(s) will be engaged to service the waste streams collected and are expected to utilise a rear lift collection vehicle. Access to the collection area has been designed to accommodate a Medium Rigid Vehicle (MRV) with general vehicle specifications as outlined in Table 11. The provision of 2 meters rear clearance and 1 meter side clearance for collection vehicles is recommended by Melbourne City Council's *Guidelines for waste management plans (2021)* to allow for emptying of bins and to allow occupants of the vehicle to safely exit and enter the vehicle.

Table 11 Loading vehicle indicative specifications, as specified by AS 2890.2 2002 – Table 2.1

Trucks	Height (m)	Width (m)	Length (m)
Medium Rigid Vehicle (MRV)	4.5	2.5	8.8

7.2 Frequency of Service

Modelling has assumed a collection frequency of every four days for all residential waste streams, and collection between one to two days for commercial waste streams. There may be opportunities to increase servicing frequency to reduce storage room area requirements. However, how frequently waste is collected in turn has proportional impacts upon the number of truck movements to and from the site and the consumption of loading dock space, so a balance between conflicting operational requirements should be considered.