

Waste Management Plan – 26 and 28 Shepherd Street, Liverpool

A submission to Coronation Property Co.

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List of Terms and Abbreviations

Abbreviation	Definition
AS	Australian Standard
C.	Principle – in this document refers to the Liverpool Development Control Plan 2008 Controls
C&D	Construction and Demolition
DCP	Development Control Plan
EPA	Environment Protection Authority
ENM	Excavated Natural Material
LGA	Local Government Area
MGB	Mobile Garbage Bin
MUD	Multi-Unit Dwelling
MSW	Municipal Solid Waste (also referred to as residential waste)
0.	Objective – in this document refers to the Liverpool Development Control Plan 2008 Objectives
VENM	Virgin Excavated Natural Material
WMP	Waste Management Plan
WSP	Waste Service Provider
WSRA	Waste Storage and Recycling Area

Introduction

MRA Consulting Group (MRA) was engaged by Coronation Property Co. to prepare a Waste Management Plan (WMP) for the proposed development located at 26 and 28 Shepherd Street, Liverpool, NSW 2170, in the Liverpool City Council (Council) local government area:

- 26 Shepherd St: A two-storey and 14-storey building of residential multi-unit dwellings (MUD);
- 28 Shepherd St: A six-storey and 21-storey storey building of residential MUD;
- Multi-level basement car parking.

The development conforms to the *Liverpool Local Environmental Plan* and *Liverpool Development Control Plan* (Liverpool City Council 2008). Waste management of the site addressed in this report relates to construction and demolition (26 Shepherd Street) and ongoing waste management (26 and 28 Shepherd Street).

This WMP is used to inform the building design in order to deliver best practice waste management and promote sustainable outcomes. All WMPs must comply with Council's codes and with any statutory requirements.

The DCP lists Waste Management Objectives (O.) and Controls (C.), which have each been addressed in this WMP (see Table 14):

- 1. Minimise waste generation and maximise resource recovery in the construction and demolition phase (O.A and O.B) and ongoing waste management of the site (O.E and O.G). Goals include waste minimisation targets set out by the Federal and State Governments. These are achieved through adequate measures to maximise recovery including notices and signage that encourage correct disposal and recycling, outlined duties of the waste service provider and waste caretaker, and appropriate waste infrastructure;
- 2. Provide satisfactory amenity through waste management (O.C and O.F) that will provide appropriately designed collection systems, and minimise adverse impact on adjoining premises;
- **3. Mitigate environmental effects** (O.D) including minimisation of the release of contaminated materials through appropriate assessment and controls; and
- 4. Compliance with Council regulations, policies and laws.

This WMP addresses the waste generation and waste flows for the design of the facilities, ongoing management of waste on-site, and construction and demolition waste.



Construction and Demolition waste flow

1. Background

The development proposed by Coronation Property Co. is located at 26 and 28 Shepherd Street, Liverpool, NSW 2170, and comprises four main building units totalling 376 apartments.

The buildings are residential MUDs of a mix of one, two and three bedrooms located on a site with a footprint of approximately 8,590m², which includes common facilities and landscaped areas.

Table 1 Buildings summ	nary				
Address	Details				
26 Shepherd St	 The Gild Units 2-storey multi-unit dwelling 13 residential units 				
	The Gild Tower				
	• 14-storey multi-unit dwelling				
	• 69 residential units				
	 The Bindery: Shepherd Side 6-storey multi-unit dwelling 65 residential units 				
28 Shepherd St	The Bindery: River Side				
	21-storey multi-unit dwelling				
	229 residential units				
	 122 residential units on west side 				
	 107 residential units in east side 				

This WMP addresses the requirements of the Consent Authority, the Liverpool City Council (Council) and addresses:

- Waste management objectives and controls for demolition waste; and
- Ongoing waste management objectives and controls.

Waste management for the site also considers best practice, necessary equipment, and integration with other guidance documents including the *NSW Waste and Avoidance and Resource Recovery Strategy* (NSW EPA 2014) and *National Waste Policy: Less Waste, More Resources* (EPHC 2009). The key policy aims that are considered are:

- Avoidance (to prevent the generation of waste);
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource; and
- Ensure that waste treatment, disposal, recovery and re-use are undertaken in a safe, scientific and environmentally sound manner.

1.1 Approach

Plans were reviewed to ensure design conformed with waste management practices. The key waste infrastructure were evaluated (see Appendix A). Objectives and controls were listed and addressed systematically based on information from plans and other available information (e.g. State 1 DA WMP for 28 Shepherd Street, GIS and mapping information).

Waste Management template forms provided by the Liverpool City Council have been completed with all key details (see Appendix B) and the report has systematically addressed the requirements of Council's DCP.

In Section 2, MRA has reviewed the project demolition and construction phases as well as associated activities, and addressed:

- Types and quantities of waste materials generated on-site;
- Any specialist waste management requirements;
- Methods for recycling and reuse; and
- Waste contractor and disposal equipment and services.

Section 3 reviews the waste streams associated with the proposed site uses. Implications for waste storage and recycling areas (WSRAs) are described including:

- Waste and recycling generation based on residential units; and
- Dimensions, layout and features required for WSRAs.

Section 4 lists supporting waste systems that are required as part of the ongoing facility management:

- Waste management equipment and systems;
- Access arrangements for residents and collection contractors;
- Amenity considerations, including for noise attenuation, ventilation, washing and security; and
- Management procedures for waste transfer, cleaning and signage.

Documents including the NSW Office of Environment and Heritage's *NSW Better Practice Guide for Waste Management in Multi-unit Dwellings*, the Building Code of Australia, and relevant Australian Standards were considered and are listed in the References (see Section 6).

1.2 Assumptions

This report is a WMP prepared as part of a development application and assumes:

- Drawings and information used in preparing this WMP have been provided from by the project architect Woods Bagot (19 December 2016) and are assumed to reflect the final building design;
- Waste generation volumes have been modelled based on standard methods and assumptions of typical residential rates. The amount of waste that will be generated in practice is affected by the level of activity and occupancy as well as users' application of waste management methods. "Users" refers to residents, tenants, visitors and workers.
- Waste management methods include those that are outlined in this WMP and also the specific practices of workers and contractors;
- The equipment design figures presented in the report are indicative only. Detailed specification can be arranged upon request; and
- The building manager will adjust, where necessary, the number of bins and the frequency of collection as required based on actual waste volumes.

2. Construction and Demolition Waste Management

Construction and demolition (C&D) waste-generating activities at 26 and 28 Shepherd Street, Liverpool, include minor demolition, excavation and construction of the proposed development (Figure 1, image October 2016). The management of C&D waste requires compliance with the DCP conditions for these phases according to objectives and controls (Liverpool City Council 2008).

This WMP considers demolition waste only for the site on 26 Shepherd Street. The site to be demolished has an approximate footprint of 2,700m² and comprises unsealed and sealed carpark, undisturbed ground and vegetated cover. Demolition waste for the site on 28 Shepherd Street has already been addressed in the Stage 1 DA that is specific to that site.

All construction waste for 26 Shepherd Street and levels seven to 21 of The Bindery River Side on 28 Shepherd Street are considered in this report, the Stage 1 DA for 28 Shepherd Street covers construction waste from basement levels and building to level six (this comprises the complete building of the Bindery Shepherd Side and part of the Bindery River Side).



Figure 1 Current aerial image of site with highlighted structure for demolition

The following objectives, put forward in the DCP, apply to demolition controls and their respective standards and procedures:

Objectives

- A. To minimise waste generation and disposal to landfill.
- *B.* To ensure efficient storage and collection of wastes and recyclables during demolition and construction stages.
- C. To minimise adverse impact on adjoining premises; and
- D. To minimise release of contaminated materials

(Liverpool DCP 2008)

The DCP refers to the management of generated waste and materials, procedures and measures for reuse and recycling. The relevant DCP objectives and controls (see Table 14 and Table 15) related to C&D waste has been addressed through assessment and management measures (see Table 2).

Table 2 Liverpool DCP requ	irements for C&D waste and waste management measures
DCP objectives and controls	12A Parkes Street waste management measures
Minimisation of waste	 Opportunities to avoid waste generation will be identified and implemented where possible (O.A); Recycling and reuse methods will be used to complement and support waste avoidance (O.B); Information and training will be used to promote waste avoidance and diversion (reuse and recycle) with demolition and construction personnel for both C&D waste and waste generated in the course of these phases (e.g. food and personal waste); Bin contractor reports will be used to monitor waste generation and characterisation. These will assist in identifying opportunities for waste avoidance and diversion of waste from landfill; Site management will consider practices that reflect Federal and State Government targets for waste minimisation. This includes the Waste Avoidance and Resource Recovery target for 80% diversion of C&D waste from landfill (NSW EPA 2014) (O.A).
Apply standards and practices that mitigate litter and pollution and their effects	 Application of standards for the demolition of structures (Standards Australia 1991) includes waste-related considerations (C.1): For at least one access and egress route to be free of accumulations and demolished materials (3.1.9). Completion of Hazardous Substances Audit (1.6.1; Appendix A1.1c,1.4d) Removal of hazardous substances by appropriate persons prior to the start of any demolition (1.6.1) Determination of most suitable points and routes of ingress to and egress from the site for the removal of demolished materials, personnel, and equipment Site maintenance including litter removal Minimise the adverse impact on adjoining premises (O.C) through appropriate assessment of the effects of waste-related activities; Erect hoardings or fencing to prevent access that could result in dumping and vandalism, and to restrict the movement of litter or wastes from the site (C.2) Avoid demolition if adverse weather is observed or forecast in order to prevent dust transportation or other effects (C.3 and C.5).
Encourage recycling and reuse	 C&D waste will be sorted per material type and recycled and/or reprocessed through a licensed C&D processor; Site personnel will be informed that food and food-packaging waste must be disposed separately from C&D waste to avoid contamination and enhance recovery of C&D materials; Use of signage, notices and other informational materials to communicate waste reduction, recycling and reuse methods; On-site source separation to facilitate waste reduction, reuse and recycling will be facilitated through allocated storage areas (e.g. for waste concrete, metals and VENM); Contractor reporting of collection and recycling will be used to ascertain appropriate disposal and processing, and identify opportunities to increase recycling and reuse; Reuse of materials where possible will be encouraged, this includes maximising onsite reuse of second-hand building materials and through other off-site methods

DCP objectives and controls	12A Parkes Street waste management measures		
	 considered appropriate (e.g. reuse of pallets, timber formwork); Sorting for recycling of personnel waste (i.e. containers and packaging) during the demolition and construction phases will be facilitated through suitable bins. 		
Manage hazardous materials	 Engaging of a site hygienist or licensed materials assessor to review the site and potential hazardous materials (C.4 and C.6); Appropriate assessment, removal and disposal of lead-contaminated materials (C.4); Licensed assessment, removal and disposal of asbestos (C.6). 		
Effective storage	 Sufficient space for storage of recyclables and waste will be allocated on-site; Separation bays, sheds, storage areas, stockpiles and bins will be used to facilita storage and collection of materials for reuse and recycling; Siting of waste storage on-site will take account of environmental factors includin runoff, drainage, leaching, dust, and associated noise and vibration. Practices f responsible and effective environmental protection are the responsibility of si demolition managers and builders. These may include the identification ar assessment of any issues and to implement monitoring and pollution-mitigatio measures. Supply of water for cleaning waste areas and dust suppression where needed; Storage and waste areas will be located to avoid vandalism, nuisance and adver visual impacts on neighbours and the streetscape. 		
Appropriate access and collection	 Access and routes for personnel to utilise disposal and recycling areas will be made clear, safe and accessible; Signage for access routes and sorting and disposal areas will be displayed; Manual handling of waste materials will be supported through appropriate equipment including trolleys and mechanical tugs where needed; Onsite access routes for collection vehicles will be safe and accessible, with sufficient space for vehicles to drive to the collection point, manoeuvre and pick up bins; Loads will be covered on trucks and trailers leaving the site to prevent waste being blown or lost (C.7); Collection frequency will be managed so that waste and recycling bins and space are appropriately utilised. This includes scheduled and as needed emptying of bins so that there is sufficient space to deposit materials. Bins will be emptied at appropriate times so that there is minimal disruption to work and bin availability; Reporting information including waste dockets will be retained on site to assist in the management of collection. Dockets and logbooks can be provided to Council to confirm facilities and contractors used for recycling and disposal. 		
Management	 The WMP (this document) is used to estimate types and volume of C&D waste generated and disposed, outline reduction, reuse and reduction practices, and address C&D waste storage and collection methods (C.11, C.1.16); Performance of waste management practices will be monitored and managed throughout the demolition and construction phases (C.11). 		

The table below describes the expected demolition waste streams, estimated quantities and recommended management (C.1.17). WMP Forms prescribed by the DCP with this information have been included in Appendix B.

Demolition Waste Materials				
Type of Material	pe of Material Estimated volume or weight (m ³ or t)	Waste management method		
		Onsite	Recycle	Landfill
Excavation material	500t	Testing for contamination and storage as appropriate to minimise dust, leaching and runoff.	C&D processor for recycling of VENM and ENM	Landfill disposal if contaminated.
		Reuse as needed.		
Bricks	None	-	-	-
Concrete	100t	Separation (e.g. from steel reinforcement bars) and appropriate storage onsite to enhance resource recovery.	Sent to a C&D processor for resource recovery including crushing and recycling for recovered products.	-
Tiles	None	-	-	-
Timber (engineered or natural)	None	-	-	-
Metal (ferrous)	20m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for metals recycling	-
Metal (non-ferrous)	50m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for metals recycling	-
Plasterboard	None	-	-	-
Green Waste	100m ³	Testing for contamination and storage as appropriate to minimise dust, leaching and runoff.	Composting or mulching at a processor	Green waste disposal to landfill for disposal based on testing results if contaminated.
Other (residual)	75m ³	Stored separately to prevent contamination of C&D waste	-	Disposed to landfill

Table 3 Estimation of demolition materials for reuse, recycling and landfill

Table 4 Estimation of materials generated during construction for reuse, recycling and landfill **Construction Waste Materials** Type of Material **Estimated volume** Waste management method or weight (m³or t) Onsite Landfill Recycle **Excavation material** Testing for contamination C&D Processor for Landfill disposal if 50,000t and storage as appropriate recycling of VENM contaminated.

		to minimise dust, leaching and runoff.	and ENM	
		Reuse as appropriate		
Bricks	20m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for reuse, or recycling through (e.g. crushing for recovered product)	-
Concrete	2,000t	Separation (e.g. from steel reinforcement bars) and appropriate storage onsite to enhance resource recovery.	Sent to a C&D processor for resource recovery including crushing and recycling for recovered products.	-
Tiles	20m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for reuse, or recycling through (e.g. crushing for recovered product)	-
Timber (engineered or natural)	500m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for chipping, organics processing or other.	Landfill if contaminated
Metal (ferrous)	50m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for metals recycling	-
Metal (non-ferrous)	100m ³	To be separated wherever possible to enhance resource recovery.	Sent to a C&D processor for metals recycling	-
Plasterboard	500m ³	Stored undercover and separated wherever possible to enhance resource recovery.	Recycled through a gypsum recycler or a C&D processor for a recovered product or gypsum processing	-
Green Waste	None	-	- 7	7
Other (residual)	200m ³	Stored separately to prevent contamination of C&D waste	1	Landfill disposal

C&D waste will be separated on-site from commercial and industrial waste that may have putrescible waste present i.e. food waste from site workers.

Note that the actual quantities, densities and bulking factors for waste and recyclables will differ on-site based on actual materials and practice and are therefore likely to differ from what has been estimated above.

To ensure best practice waste management, the contractors and facilities listed in Table 5 have been proposed based on their location and service offerings.

Table 5 Waste service contractors and facilities

Role	Details
Principal Waste Collection Contractor	Visy Recycling and Dats Skip Bins contractor services
Principal Off-Site Recycler	DADI Genesis Xero Recycling Facility, Honeycombe Drive, Eastern Creek NSW
Principal Licensed Landfill Site	Eastern Creek Resource Recovery Park, Wallgrove Road, Eastern Creek NSW

2.1 Site documentation

This WMP will be retained on-site (C.12) during demolition and construction phases along with other waste management documentation (e.g. contracts with waste service providers).

Responsibility for the WMP, waste documentation and processes during the construction and demolition phases will be with the demolition contractor or builder.

A logbook that records waste management and collection will be maintained on-site (C.12, C.1.19), with entries including:

- Time and date;
- Description of waste and quantity;
- Waste/processing facility that will receive the waste; and
- Vehicle registration and company name.

Waste management documentation, the logbook and associated dockets and receipts must be made available for inspection by an authorised Council Officer at any time during site works (C.1.20).

3. Ongoing Waste Management Requirements

3.1 Overview

The ongoing waste management requirements of the site arise as a results of the daily operations and residential activities in the site. Waste management for the site covers both 26 and 28 Shepherd Street, since some service requirements are shared (e.g. waste collection and maintenance of WSRAs). There are five WSRAs, which service different buildings (C.3.1.2, see Appendix A), and are used for the storage of waste and recycling bins. These WSRAs are located in the building basement level 01. Bins are transferred to the laneway loading area for collection via a waste hoist.

Table 6 outlines the waste management infrastructure for the development, and Figure 2 shows WSRAs in relation to the buildings of the development.

Address	Details	Waste system infrastructure
26 Shepherd St	 The Gild Units 2-storey multi-unit dwelling 13 residential units The Gild Tower 14-storey multi-unit dwelling 69 residential units 	 Basement Level One Chute core and outlet Waste storage and recycling areas Waste hoist to laneway level collection point 660L MGBs for general waste and recycling The Gild Units Waste service areas and chute hopper Chute core The Gild Tower Waste service room and chute hopper Chute core
28 Shepherd St	 The Bindery: Shepherd Side 6-storey multi-unit dwelling 65 residential units The Bindery: River Side 21-storey multi-unit dwelling 229 residential units 122 residential units on west side 107 residential units in east side 	 Basement Level One Chute core and outlet Waste storage and recycling areas Waste hoist to laneway level collection point 660L MGBs for general waste and recycling The Bindery: Shepherd Side Waste service areas and chute hopper Chute core The Bindery: River Side Waste service room and chute hopper Chute core

Table 6 Residential waste system infrastructure



Figure 2 Plan of waste storage and recycling areas in development basement level 1

The DCP refers to the consideration of ongoing management of generated waste and materials, and procedures and measures for reuse and recycling (see Table 14 and Table 15)

3.2 Residential waste generation and storage requirements

Requirements for waste management have been drawn from the Liverpool DCP. Contractor services will be used for waste and recyclables collection.

Waste generation rates for residential units have been applied according to the NSW Office of Environment and Heritage *Better Practice Guide for Waste Management in Multi-Unit Dwellings* (NSW OEH 2008b). A number of assumptions have been utilised to calculate total waste generated (Table 7).

Table 77050	perorio aoca to commute i	contential maste generation
Stream	Assumption	Details
Waste	80L/unit/week Twice-weekly collection	Waste generation per unit per week is measured in volume. This data is used to assess the number of bins required and waste room sizing.

Table 7 Assumptions used to estimate residential waste generation

Recycling	40L/unit/week Twice-weekly collection	Recyclables generation per unit per week is measured in volume. This data is used to assess the number of bins required and waste room sizing.
Organics	No service	There will be no organics (green/food waste) service offered. Occupants can choose to use a household worm farm or compost bin. A gardening contractor will manage the site's gardens and will also be responsible for green waste disposal and/or treatment and composting of garden organics waste.
Bulky items	1m ³ /unit/year Weekly collection or as required	6m ³ bulky items storage sizing requirement is specified in the Liverpool DCP. Bulky items storage can be in the form of a secure lockable cage, with collection arranged as needed.

The area required for waste storage at each of the WSRAs has been calculated in the following sections on the assumption of twice-weekly collections.

Waste generation has been calculated for each building and grouped according to their shared WSRA and waste service requirements. These WSRA building groups are:

- 1. The Gild Units at 26 Shepherd St
- 2. The Gild Tower at 26 Shepherd St
- 3. The Bindery: Shepherd Side at 28 Shepherd St
- 4. The Bindery: River Side at 28 Shepherd St western building
- 5. The Bindery: River Side at 28 Shepherd St eastern building

3.2.1 The Gild Units at 26 Shepherd St

The 2-storey multi-unit dwelling at 26 Shepherd St comprises 13 residential units and common-use areas. Table 8 presents the estimated waste generation for the site while key waste management infrastructure and requirements include:

- Waste service area and chute access on every floor;
- Waste storage and recycling area in basement;
- Common-use areas bins, serviced by building staff to the waste room; and
- Contractor services for twice-weekly waste and recycling collection of 660L MGBs.

Table 8 Residential waste generation for The Gild Units

The Gild Units Waste Generation and Waste Room Requirements			
Estimated volume of waste	Total generation of 1,560 L per week	Waste generation of 1,040 L per week	
	1	Recyclables generation of 520 L per week	
Number of bins required	Total of 2 bins (660L MGBs)	1 Waste bin (660L MGB)	
		1 Recycling bin (660L MGB)	
Area Required	15m ² for bin storage and equipment (either carousel or linear track)		

3.2.2 The Gild Tower at 26 Shepherd St

The 14-storey multi-unit dwelling at 26 Shepherd St comprises 69 residential units and common-use areas. Table 9 presents the estimated waste generation for the site while key waste management infrastructure and requirements include :

- Waste service area and chute access on every floor;
- Waste storage and recycling area in basement;
- Common-use areas bins, serviced by building staff to the waste room; and
- Contractor services for twice-weekly waste and recycling collection of 660L MGBs.

Table 9 Residential waste generation for The Gild Tower

The Gild Tower Waste Generation and Waste Room Requirements			
Estimated volume of waste and recyclables	Total generation of 8,280 L per week	Waste generation of 5,520 L per week	
		Recyclables generation of 2,760 L per week	
Number of bins required	Total of 7 bins (660L MGBs)	3 Waste bins (660L MGBs)	
		4 Recycling bins (660L MGBs)	
Area Required	26m ² with minimum radial diameter dimension of 4m at chute outlet to accommodate a compaction carousel		

3.2.3 The Bindery: Shepherd Side at 28 Shepherd St

The 6-storey multi-unit dwelling at 28 Shepherd St comprises 65 residential units and common-use areas. Table 10 presents the estimated waste generation for the site while key waste management infrastructure and requirements include:

- Waste service area and chute access on every floor;
- Waste storage and recycling area in basement;
- Common-use areas bins, serviced by building staff to the waste room; and
- Contractor services for twice-weekly waste and recycling collection of 660L MGBs.

Table 10 Residential waste generation for The Bindery, Shepherd Side

The Bindery: Shepherd Side Units Waste Generation and Waste Room Requirements			
Estimated volume of waste	Total generation of 7,800 L per week	Waste generation of 5,200 L per week	
		Recyclables generation of 2,600 L per week	
Number of bins required	Total of 8 bins (660L MGBs)	4 Waste bins (660L MGBs)	
		4 Recycling bins (660L MGBs)	
Area Required	37m ² with minimum diameter dimens	ion of 4m at chute outlet to accommodate a	

3.2.4 The Bindery: River Side at 28 Shepherd St

The 21-storey multi-unit dwelling at 28 Shepherd St comprises 229 residential units and common-use areas. The building section is serviced by one waste system that includes two chutes on every floor and two waste rooms in the basement.

Each chute serves the west or east side of the building. The west side comprises 122 units. The east side comprises 107 units.

Table 11 and Table 12 presents the estimated waste generation for the western and eastern sides of the building respectively, while key waste management infrastructure and requirements include:

- Waste service area and chute access on every floor for each of east and west building sides;
- Waste rooms in basement for each of east and west building sides;
- Common-use areas bins, serviced by building staff to the waste rooms; and
- Contractor services for twice-weekly waste and recycling collection of 660L MGBs.

Table 11 Residential waste generation for the western building of The Bindery, River Side

West side at The Bindery: River Side (122 units) Units Waste Generation and Waste Room Requirements			
Estimated volume of waste To and recyclables w	Total generation of 14,640 L per week	Waste generation of 9,760 L per week	
		Recyclables generation of 4,880 L per week	
Number of bins required Total of	Total of 13 bins (660L MGBs)	6 Waste bins (660L MGBs)	
		7 Recycling bins (660L MGBs)	
Area Required	Total 47m ² with minimum diameter dimension of 4m at chute outlet to		
	accommodate a compaction carousel		

Table 12 Residential waste generation for the eastern building of The Bindery, River Side

East side at The Bindery: River Side (107 units) Waste Generation and Waste Room Requirements			
Estimated volume of waste and recyclables	Total generation of 12,840 L per week	Waste generation of 8,560 L per week	
		Recyclables generation of 4,280 L per week	
Number of bins required	Total of 11 bins (660L MGBs)	5 Waste bins (660L MGBs)	
		6 Recycling bins (660L MGBs)	
Area Required	Total 45m ² with minimum diameter dimension of 4m at chute outlet to accommodate a compaction carousel		

3.3 Residential waste storage and recycling areas

Dimensions of WSRAs and waste collection frequency have been calculated based on the estimated waste generation.

The residential WSRAs service different building sections (see Appendix A). The recommended details of WSRA construction and management include the use of appropriate materials, building features and signage (see Section 4.4).

The WSRAs have been sized to allow placement of equipment, bin manoeuvring, safe handling space, access for inspection, service and maintenance (C.2.1, C.3.1.6) see Appendix F) and the following equipment:

- A chute with outlet(s) to discharge waste. If an eDiverter system is installed, this will be used to also discharge recycling based on resident's selection on the chute inlet control panel;
- Waste bin that receives waste from one outlet. Waste is compacted to a ratio of approximately 2:1 (compaction of up to 3:1 can be achieved). Compaction reduces the number of bins required and the waste collection frequency;

- Recycling bin that may be filled by the waste caretaker from collection from shared service areas or that receives recyclables from the chute system. Recyclables are not compacted in order to enhance resource recovery potential, in line with resource recovery objectives and targets;
- Waste carousel or linear track that allows bins to be mechanically moved when full or for removal from under the chutes, for the waste caretaker to swap for empty bins or move to the collection point; and
- Storage of safety and maintenance equipment.

Guidelines for appropriate and safe access have been met, including a minimum access width of 600mm (WorkCover 2011). The location of the WSRAs is shown on Figure 3. Chute penetrations are vertically aligned and continuous through all levels of the building to the outlet in the WSRAs.



Figure 3 Location of waste and recycling areas and collection access route

Access to the collection point and loading bay adjacent to the site laneway is facilitated through manoeuvring of bins on the basement level. Bins are moved to the waste hoist and lifted to ground level. Design and use of the waste hoist avoids transfer of the bins up the ramp to ground level. This reduces travel distance and avoids slopes in the bin path, so that handling and safety is improved.

The configuration of equipment in WSRAs will be agreed with the supplier, manufacturer or designer based on the specifications outlined in this WMP. Example equipment for the WSRAs includes a waste carousel that accommodates 660L MGBs (see Appendix F). Monitoring of bins and the WSRA can help to ensure waste services amenity is maintained. This includes the inspection of equipment, assessment of servicing needs, and changes to bin numbers if there is under or over-utilisation.

The building or waste caretaker or other staff will monitor the number of bins required for collection. If additional capacity is required, building management may need to increase the collection frequency. Noise and traffic disturbance need to be considered if collection is increased.

4. Equipment and Waste Management Systems

4.1 Collection points and loading areas

The collection point provides access to the waste service provider (WSP). Measures for ensuring safety, and improved handling and loading are provided through:

- Collection and loading on-site via private laneway access to the loading area;
- Clear, safe, accessible and convenient space for handling of MGBs and equipment, and loading of collection vehicles; and,
- Identifiable areas where residents, tenants, visitors and workers can recognise and avoid any risk associated with moving vehicles, and bin moving and handling.

Table 13 outlines relevant requirements and specifications (C.2.2.5, C.3.1.8, C.4.5). Collection services will be provided by a private contractor.

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	 Adequate clearance and manoeuvring space; Sufficient clearance for the safe handling of materials and equipment; Sectioned and enclosed loading bay does not impede upon traffic and pedestrian safety.
Vehicle manoeuvring and loading space	Truck space for adequate lift clearance, manoeuvring and operation for a contractor collection vehicle	 Adequate loading bay dimensions do not impede rear lift clearance; Operational clearance for truck manoeuvring in and out of the loading bay. The provision of space clear of vehicle parking spaces;
Operating times	Appropriate collection times to limit noise and traffic disturbance	 Collection times will be arranged to ensure minimal disturbance to residents, pedestrians and visitors.

Table 13 Collection points and loading areas requirements and specifications

The waste and recycling bins stored in the WSRAs will be tipped by the WSP vehicle in the loading bay. Bins will be moved by the waste caretaker to the collection point via MGB travel routes to the waste hoist (see Appendix A). Routes between WSRAs and collection points need to be suitable for safe and efficient handling. Mobile powered tugs may be required to transport MGBs from the WSRA to the collection point loading area (see Appendix D).

Tug options are based on load weights. Compacted waste in each 660L bin averages 200kg in weight, based on NSW EPA waste characterisation for typical residential waste. The weight of the bin itself is approximately 30kg based on nominal design requirements set out by mobile waste container standards (Standards Australia 2008).

4.2 Resident waste disposal and recycling method

Waste and recycling is managed per unit (C.2.2.1) and then brought to a hopper inlet by residents, where it is deposited and conveyed to the WSRA and managed by the waste caretaker (C.2.2.2, Figure 4). Residents will not be required to carry waste or recyclable more than 30m to a waste service area or chute hopper inlet (C.4.3). Resident transfer paths on floor plans in buildings show that this distance is not exceeded.

Figure 4 Waste flows for ongoing waste management



4.3 Waste management duties

Building management will engage a waste caretaker to enact and monitor daily waste management operations. Should there be any issues that impact on the operational efficiency, safety and suitability of waste management, the waste caretaker will inform management. The good operation of the waste management system is the responsibility of building management and the waste caretaker.

Building management is responsible for:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information to tenants and residents on sorting methods for recycled waste, awareness of waste management procedures for waste minimisation and resource recovery;
- Making information available to residents, tenants, visitors and workers about waste management procedures;
- Appropriate signage in waste service and chute hopper inlet areas per floor and all waste management areas;
- Using contracts to define the allocation of responsibilities with cleaners and building managers;
- Holding a valid and current contract with a licensed waste service provider for waste and recycling collection and disposal;
- Encouraging waste avoidance and achievement of resource recovery targets;
- Providing operational management for delivery of waste objectives;
- Chute and other waste management equipment maintenance;
- Organising both waste and recycling pick-ups by private contractor as council does not service the building.

Waste caretaker duties (C.3.1.5) include:

- Organising, maintaining and cleaning the WSRAs and service areas as part of a daily schedule;
- Coordination of personnel as needed;
- Collecting and exchanging recycling crates and bins from service areas where used (C.4.4);
- Monitoring ventilation and amenity of waste service areas (C.4.4);
- Arranging access to WSRAs and bins on collection days and to liaise with the WSP for operational issues;
- Cleaning and exchanging bins in WSRAs and on bin carousels and tracks;
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry; and
- Operation of the eDiverter (if installed), compactor and linear track (this is conditional upon formal training from suppliers).

4.4 Waste storage and recycling areas

The WSRAs will provide storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. Each WSRA will be constructed to improve amenity, minimise odour, protect surrounding areas and promote user safety. WSRA specifications include:

- Signage for safety and waste bin identification;
- Safety precautions, staff training and signage for plant;
- Noise attenuation for waste management and WSRAs that limits effects to residents from compactor, bin transfer and collection vehicle noise;
- Floors constructed of concrete or other approved solid, impervious material that can be cleaned easily;

- Grading and draining to an approved drainage fitting located in the room. The drainage point will have a fine drain cover to filter coarse pollutants (C.3.1.5);
- Smooth, even surface covered with vertical wall and plinth faces;
- Doorway ramp (if not level);
- Light colour finish for all room surfaces;
- Adequate supply of water with hose cock as close as practicable to the doorway (C.3.1.5);
- Close fitting and self-closing door;
- Suitable construction including limited entry paths to prevent vermin;
- Ventilation through permanent unobstructed ventilation (5% of floor area) or mechanical exhaust ventilation system (5L/s per m² of floor area);
- No incineration of waste will be used on site (C.5.2); and
- Security and lighting (C.3.1.4).

4.5 Chute system

The chute system accepts waste disposed by residents in each building for each WSRA. Chutes consist of a chute hopper inlet, chute core, outlet, and service points for cleaning and maintenance (C.2.2.4). Chute access will be located within a waste service area (C.5.3.1).

A dual-use chute system for recycling may be used to assist in the promotion of resource recovery and convenience to residents. Residents will have access to a dual-use chute on each residential floor. The installation of a recycling chute eliminates the need to have recyclables stored and removed throughout the building. This reduces manual labour and improves visual amenity.

Chute penetrations have been indicated on each floor as required on drawings.

The chute system includes access areas on each floor, chute core, service access points and chute outlet to the residential WSRA. A full chute specification is required for the build, this includes:

- A waste chute in either 600mm galvanised steel or 510mm recycled LLPDE polyethylene plastic (C.5.3.4);
- A minimum two-hour fire rated door;
- To minimise noise disturbance, chutes are located away from habitable rooms (C.5.3.3). Hoppers are wrapped with noise insulation foil (e.g. 50mm poly-wool R3.1) and the walls of the shaft area surrounding the chute system are to be built to an appropriate sound reduction index (e.g. Rw50) specification;
- Minimal offsets of the chute in relation to outlet;
- Vents exiting at the top of each chute and wash down system. Frequency of maintenance and upkeep (washing) to be instructed by chute supplier (C.5.3.4); and
- Chute openings for placement of fire sprinklers on every second level (C.5.3.5).

4.6 Hoist

The WSRA will be fitted with a hoist (see Appendix G). The hoist will enable filled MGBs from WSRAs on basement level 01 to be raised to the loading area on the ground floor for collection.

4.7 eDiverter

An eDiverter system to discharge waste and recyclables from the chute into the appropriate bin in the WSRA will be installed based on service needs and whether appropriate for the building (C.5.3.2). A full eDiverter specification is required for the build. The general specification listed below provides guidance for the purpose of the WMP:

- Split system body with two bottom outlets;
- Shut out door with manual override to close off chute fitted with fusible link;
- Internal diverter, activated by a hydraulic cylinder;
- Hydraulic power pack with single phase;
- PLC control box in garbage room, programmed to operate diverter and lock out doors;
- Doors fitted with electronic lock out normally closed solenoid; and
- Operating instructions and labels on every level.

4.8 Compactor

Waste will be deposited directly into the 660L MGB in the WSRA and compacted at a 2:1 density by a ceiling mounted compactor (C.2.2.3). Supplier information states that compaction can be up to three times the density (Elephants Foot Recycling Solutions 2016)

4.9 Food organics and green organics equipment

No areas for organics equipment have been provisioned for in the design of the residential WSRAs.

Food organics waste generation can be collected and treated on-site at a small scale according to the site selection and the availability of space that is appropriate. This supports landfill diversion targets for MSW. For example, worm farms have become a sustainability feature of some developments (see Appendix E).

Green organics waste generated by garden and plantings maintenance will be removed and processed or disposed by the gardening/landscaping contractor.

Provision of space (within units or a centralised location) for residents to use worm farms or a compact compost bin, or a shared use facility may be considered by residents or building management.

Educational materials to promote waste minimisation through food waste avoidance may be provided to residents (see Appendix I).

4.10 Bulky items storage

Sufficient space has been provisioned for bulky items storage as part of residential waste generation (C.5.1). The form of storage is an allocated area, partitioned room, or a secure lockable cage, which is accessible only by residents. Management and access to the bulky items room can be facilitated through the waste caretaker.

The minimum size of the bulky items storage is $6m^3$, with a minimum height of 2m. Signage will be displayed to identify the room. This is the minimum space required by the DCP, and will require weekly collection, based on resident use and a bulky waste generation rate of $1m^3$ per year per unit.

The room provisions for the storage of bulky items (such as mattresses and furniture), and will have signs describing appropriate use of the area (e.g. no hazardous materials such as fluorescent tubes, paints or e-waste). Educational materials for sorting may be provided to residents to promote resource recovery, waste minimisation and appropriate disposal (see Appendix I).

4.11 Signage

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia 1994).

Signage is designed taking into account language (includes to reflect the current Liverpool LGA demographic) and accessibility (i.e. to be understood as clearly as possible by those with different abilities of vision, knowledge of the English language, intellectual ability and with other conditions) (C.5.4.1).

Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in each WSRA and waste service area (C.5.4.1) indicating that:

- Garbage is to be bagged and placed into the chute;
- Detail on acceptable recyclables;
- Recyclables are to be decanted loose (not bagged);
- No standing and danger warnings apply to the area surrounding the WSRA;
- Contact details for arranging the disposal of bulky items;
- Chute operation instructions including emergency contacts;
- The area is to be kept tidy.

Standard signage requirements and guidance for application apply (see Appendix H).

4.12 Prevention of pollution and litter reduction

To minimise dispersion of litter and prevent pollution (to water and land via contamination of runoff, dust and hazardous materials), building management and the waste caretaker will also be responsible for:

- Maintenance of open and common site areas;
- Ensuring WSRAs are well maintained and kept clean;
- Securing the waste storage area from vandalism and the escape of litter (C.2.2.6);
- Identification and appropriate disposal of goods with hazardous material content (paints, e-waste, fluorescent tubes);
- Taking action to prevent dumping and unauthorised use of waste areas; and
- Requiring contractors to clean up any spillage that may occur during waste servicing or other work.

5. Compliance Summary

This WMP pertains to the building design and site drawings and complies with Council's design requirements as prescribed in the DCP (Liverpool City Council 2008).

	C&D Waste	Section of this report where this is addressed
Objectives	O.A To minimise waste generation and disposal to landfill.	Section 2
	O.B To ensure efficient storage and collection of wastes and recyclables during demolition and construction stages.	Section 2
	O.C To minimise adverse impact on adjoining premises; and	Section 2
	O.D To minimise release of contaminated materials	Section 2
Compliance with demolition standard	C.1 Demolition work must comply with <i>Australian Standard AS2601- 1991 The Demolition of Structures</i> .	Section 2
Security fencing	C.2 Hoardings or fencing must be erected to prevent unauthorized access.	Section 2
Weather observation	C.3 Effects from winds including dust transportation must be considered. Demolition during adverse conditions must be avoided.	Section 2
Lead-contaminated materials	C.4 Materials containing lead must be handled and disposed of in accordance with EPA requirements.	Section 2
Dust control	C.5 Implementation of dust controls to the site prior to and during demolition.	Section 2
Asbestos	C.6 Removal and disposal in accordance with the requirements of WorkCover.	Section 2
Covered loads	C.7 All trucks and trailers entering and leaving the site must have their loads adequately covered. Signage must indicate cover requirements at the entrance and exit.	Section 2
Toilets	C.8 Temporary toilet facilities must be provided on the site until all demolition work is completed.	Does not apply
Demolition hours	C.9 Specification of weekday/weekend/holiday hours.	Does not apply
Sound pressure levels	C.10 Sound pressure levels emanating from the site must not exceed levels established by the EPA.	Does not apply
WMP submission	C.11 A WMP is to be submitted with the DA. It must include:	Section 2
	- Volume or area estimates.	
	types of waste produced on-site including excavation.	
Site documentation	C.12 Documentation must be retained on site including the WMP and lawful disposal log book.	Section 2
Subdivision works	C.13 Subdivision works must be addressed, including disposal.	Does not apply
Zone of influence	C.14 Reporting on the effects to neighbouring buildings and potential effects based on Dilapidation Reports.	Does not apply

Table 14 Compliance summary of demolition waste management DCP Objectives and Controls

	Ongoing Waste	Section of this report where this is addressed
Objectives	O.E Minimise waste produced during demolition and construction of new development and maximise resource recovery.	Section 3 Section 4
	O.F To ensure waste management for the end use of the development is designed to provide satisfactory amenity for occupants and provide appropriately designed collection systems. To minimise adverse impact on adjoining premises; and	Section 2 Section 3 Section 4
	O.G To minimise ongoing waste to landfill and maximise recycling of ongoing waste.	Section 2 Section 3 Section 4
Controls - General Requirements for this WMP	C.1.16 The waste management plan to address demolition waste, construction waste, and ongoing waste management	Section 2 Section 3 Section 4
	C.1.17 Estimated volumes of waste generated according to type. Information about reuse, recycling and disposal options for all types of waste produced on site during ongoing waste generation activities.	Section 2 Section 3
Controls – Construction and demolition waste reporting	C.1.18 During demolition and construction the WMP together with proof of lawful disposal for all waste that is disposed of or otherwise recycled form the site must be retained onsite in a Waste Data File. Proof is to include a log book with associated receipt/invoices, waste classification and site validation certificate.	Section 2
	 C.1.19 All entries in the Waste Data File must include: Time and date Description and size of waste Waste facility used Vehicle registrations and company name 	Section 2
	C.1.20 The Waste Date File must be made available for inspection by any authorised Council Officer at any time during site works and at the conclusion of site works should be retained by the person responsible and made available for inspection by authorised Council Officers.	Section 2
Controls - Waste Management Facilities	C.2.1 Waste management facilities shall be provided for in all new buildings (except dwelling houses, attached dwellings, semi-detached dwellings and dual occupancy). These shall be designed to ensure that the storage and collection of waste and recyclables is user friendly for both the occupant and the waste collection contractor.	Section 3 Section 4
Controls - On site storage details	C.2.2.1 Location of space within the dwelling for the separation and temporary storage of waste, recyclables and compost with sufficient capacity for a minimum of one day's waste or recycling.	Section 3 Section 4
	C.2.2.2 Location and design of the waste storage and recycling area on the premises. This must be readily accessible for both residents and waste and recycling contractors.	Section 3 Section 4
	C.2.2.3 Where applicable, design details of any volume reduction equipment. The use of volume reduction equipment (to compact waste materials) may be appropriate where space is a problem. Volume reduction equipment should not be used on recyclables; removing contaminants form compacted recyclables is almost impossible and	Section 3 Section 4

Table 15 Compliance summary of C&D and ongoing waste management DCP Objectives and Controls

	compacted contaminated loads will be rejected by end markets.	
	C.2.2.4 For buildings more than three (3) storeys, or where elevator access is required for dwellings on the upper levels a waste service room, or compartment must be provided on each floor of the building for the intermediate storage of garbage and/or recycling. Sufficient space must be allocated for access by residents, storage of bins, and easy manoeuvring of bins.	Section 3 Section 4
	C.2.2.5 The area must be suitably located on premises in terms of accessibility for both the occupants and the waste and recycling contractor. The system for waste management must be compatible with available collection services – collection occurs at the front of the land.	Section 2 Section 4
	C.2.2.6 Measures for protecting bins and associated waste equipment from theft or damage are to be indicated within the WMP.	Section 4
Controls - Provision of ongoing waste management facilities	C.3.1.2 In the case of multi dwelling housing of 9 or more dwellings and residential flat buildings one or more garbage and recycling enclosures are to be provided within the site.	Section 3 Section 4
racilities	C.3.1.3 Bin bays are to be well ventilated and screened to a minimum height of 1.5m by a structure and landscaping. Construction materials are to be compatible with the proposed development and adjoining development.	Does not apply
	C.3.1.4 Bin bays or waste service rooms are to be sufficiently open and well-lit to allow safe use after dark.	Section 3 Section 4
	C.3.1.5 A hose cock for hosing the garbage bin bay and a sewered drainage point are to be provided in or adjacent to the bin storage area. The drainage point should have a fine grade drain cover sufficient to prevent coarse pollutants from entering the sewer. If the hose cock is located inside the bin storage bay it is not to protrude into the space indicated for the placement of bins. Responsibility for cleaning of all waste storage areas should be determined when designing the system and clearly stated in the waste management plan. Frequency of cleaning to eliminate odour and pests should be indicated on the WMP.	Section 3 Section 4
	C.3.1.6 Sufficient space must be allocated within the bin bays to allow for access to all required bins by residents and waste collectors, as well as manoeuvring of bins within the bay and for the removal and return of bins by the waste collector.	Section 4
	C.3.1.7 The agreed numbers of bins that will require storage are given as a consent condition.	Appendix B
	C.3.1.8 In the case of secure developments where garbage and recycling bins are stored within the secure area, the WMP needs to indicate:	Section 4
	 Arrangements for supervised access by council contractors to collect waste must be shown to the satisfaction of Council; or Arrangements for delivery of bins to kerbside and removal when emptied to within the development must be shown Council waste and recycling contractors are not to be provided with keys, pass keys, or other mechanical or electronic means of entry to secure developments. 	

Controls - Access to waste and recycling storage	C.4.1 Bin bays are to be adjacent to a street frontage, or if not possible then at a designated point adjacent to the common access driveway provided sufficient level areas (<5% grade) is available for bin collection to be carried out, away from vehicle ramps and steps. The bin bay is to be located so that distance from bin bay to the nearest waste collection point accessible by the collection vehicle is no further than 15m. The bin bay shall be positioned so as to minimise noise impacts on residents from the usage of bins and waste or recycling collection.	Does not apply
	C.4.2 The access routes should be highlighted on the plan. Access must be made available by wheelchair for occupants. Bin bays should allow for bins to be wheeled by to the street kerb over flat or ramped surfaces with a maximum grade of 7% and not over steps, gutters, or landscape edging. The need for manual handling by collection staff should be kept to a minimum.	Does not apply
	C.4.3 Residents should not be required to carry waste or recyclables more than 30m to a waste storage area such as a bin bay, or in the case of a residential flat building greater than three storeys, a waste service room for interim storage of waste and/or recyclables. Recycling bins are not to be stored in isolation, but in close proximity to garbage bins or chutes.	Section 4
	C.4.4 Waste service rooms or compartments where provided, shall be enclosed and of design compatible with the proposed development. Adequate ventilation shall be provided for the room or compartment. Suitable arrangements for transfer of any interim storage to the main bin bay are to be indicated in the WMP.	Section 4
	C.4.5 Waste and recycling collection vehicles should be able to service the development efficiently and effectively and with no need to reverse. Current collection vehicles are fitted with a left side lifter for handling MGBs, with a minimum height clearance of 3.6 m when lifting and 4.7m width when lifting.	Section 4
	C.4.6 Council and waste collection contractor vehicles will not enter private property including driveways to collect waste or recycling.	Does not apply
Controls - Other Waste Considerations	C.5.1 In the case of multi dwelling housing or residential flat buildings of more than 25 dwellings, a designated space reflecting the number of dwellings shall be provided for temporary storage of disposed bulky items awaiting Council clean up or contracted removal. The minimum allocated space must be 6sqm, with a minimum height of 2m. The space shall be signed as to its purpose.	Section 4
	C.5.2 No waste incineration devices are permitted.	Section 4
Controls - Garbage Chutes	C.5.3.1 Garbage chute access can only be located within a waste service room or compartment.	Section 4
	C.5.3.2 Recycling chutes are not permitted. Recycling bins for interim storage are to be proved in each waste service room.	Section 4
	C.5.3.3 Garbage chutes are not to be situated adjacent to habitable rooms.	Section 4

	C.5.3.4 Applications must state the material the chute is to be made from, how the chute is to be cleaned, how often the chute will be cleaned, how any blockages will be removed and any fire protection measures to be used.	Section 4
	C.5.3.5 The waste collection system that the chute feeds into must be stated (compactor, carousel, open bin) and suitable for the number of dwellings in the development.	Section 3 Section 4
Controls - Signage	C.5.4.1 Signage should be in English and languages reflective of current Liverpool LGA demographic.	Section 4
	C.5.4.2 Illustrative graphics will form a minimum of 50% of the area of the signage.	Section 4
	 C.5.4.1 Council can provide appropriate bin bay usage signs if required. Signage is to be prominently posted in each bin bay, or waste service room indicating that: Garbage is to be placed wholly within the garbage bins provided. Only recyclable materials accepted by Council shall be placed within the recycling bins. The area is to be kept tidy. A telephone number for arranging the disposal of bulky items. Should garbage chutes be incorporated, signage on how to use 	Section 4
	itself.	

6. References

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Site Plan Appendix A

Figure 5 Site plan and waste arrangement



Appendix B Application Submission Matrix and Checklist, and Waste Management Plan template

Figure 6 Waste Management Plan – Construction Form

Will you use Site Cleaners?	⊠ Yes, for □ Yes, for □ No	r some work o r all work or	r	Estimate volume o	d total or weight	Approx 80
Please supply details of site cleaners used	ABN Numb Name Phone	perTBC		Mobi	le	
If using site cleaners for a	ll work, plea	se STOP here	. DO N	IOT conti	inue to compl	ete form.
All Excavation Material including Swimming Pools	□ Less th ☑ More th	an 10m ³ an 10m ³		□ Reu ⊠ Reu ⊠ Lan	se onsite se offsite dfill Disposal	
Name and Address of licensed land Eastern Creek Resource Recovery Par	fill k, Wallgrove	Road, Eastern (Creek	NSW		
Type of Material	Less than 10m ³	More than 10m ³	0	How wi	II you manage Recycle	e this waste?
Bricks					凶	
Concrete		⊠			×	
Tiles		⊠			X	
Timber (clean or treated)		×			X	
Plasterboard		×			X	
Green Waste		×				
Other		X				X
Principal Off-Sit	e Recycler			Pri	ncipal Licens	ed Landfill S
DADI Genesis Xero Recycling Facility,				Easter	n Creek Resou	rce Recovery
Honeycombe Drive, Eastern Creek NS	N					ern oreek No

Waste Management Plan – D	emolition					
Please fill in if applicabl	Demoliti	ion Cont	aining	Asbesto	S	
Tick (If under 10m², complete	⊠ if under 10m e General Demo	²	te details	Tick ⊠	if over 10m ²	
Work Cover Licence No.						
Demolition Contractor Details	To be determined based on assessment by a qualified or licensed worksite hygienist and/or asbestos licence-holder			qualified or icence-holder		
	General I	Demoliti	on Was	te		
Type of Material		Less than 10m ³	More than 10m ³	How Onsite	will you ma Recycle	nage this waste? Landfill
Bricks			X		×	
Concrete			Ø		×	
Tiles			×		X	
Timber (clean)			⊠			
Timber (treated)			X		×	
Asphalt			X		×	
Metals					Ø	
Plasterboard			X		×	
Green Waste			X		X	
Other-specify Residual						X
Principal Off-Site Rec	ycler		Pri	ncipal Lic	ensed Land	fill Site
DADI Genesis Xero Recycling Fa	cility,		Eas	tern Creek	Resource Red	covery Park
Honeycombe Drive, Eastern Creek NSW			Wal	lgrove Roa	d, Eastern Cro	eek NSW

Application Submission Matrix and Checklist + Waste Management Plan (Please scan on CD/USB, single sided, as two separate documents)

Waste Management Plan – Ongoing Waste and Recycling (Medium & High Density Residential Development only)					
☑ Residential Development Multi Unit Dwellings (MUD) □ Mixed Residential/Commercial Development		Commercial/Industrial Development (including Child Care Centres)			

If you have ticked the commercial/industrial development option, a commercial waste service must be provided. As Council does not provide a commercial waste service, please STOP here. DO NOT continue to complete form.

Council specifications for waste collection

Garbage bins and Recycling Bins provided by Council to RFBs at 120 litres per unit per week as follows:

Bin Types	Bin Allocation for	Bin Allocation for	Truck Required
	Proposed Units-	Proposed Units- Twice	To Service Bin
	Weekly Service	weekly Service	
240 litre mobile bin*	1 per 2 units	1 per 4 units	Side lift
360 litre mobile bin**	1 per 3 units	1 per 6 units	Side lift
660 litre bulk plastic bin	1 per 6 units	1 per 12 units	Rear Lift
1100 litre bulk plastic bin	1 per 9 units	1 per 18 units	Rear Lift
1m3 metal bin	1 per 8 units	1 per 16 units	Front lift
1.5m3 metal bin	1 per 13 units	1 per 26 units	Front lift
3 m3 metal bin	1 per 25 units	1 per 50 units	Front lift
4.5m3 metal bin	1 per 38 units	1 per 76 units	Front lift

*Mobile bins must be presented to kerb for collection

**Only provided for garbage not recycling

Note: 240 litre garden waste bins, on request for use in common areas, collected fortnightly ONLY

Please complete the table below by indicating the number and size of bins required for the number of units proposed (which will determine the frequency of waste collections per week).

Bin Type	Number of Individual Units	Number of Bins Required	Collection
660 L MGB	376 units	35	□ Weekly ⊠ Twice weekly

Dimensions of each bin type:

Bin Receptacle	Length (mm)	Width (mm)	Height (mm)	Bin Footprint (m²/bin)
140L	640	535	920	0.27
240L	730	580	1060	0.42
360L	865	650	1100	0.42
660L	1420	780	1210	1.16
1100L	1420	1100	1270	1.71
1m3	1740	1100	1100	0.99
1.5m3	2040	1250	1220	1.46
3m3	2040	1650	1590	2.10
4.5m3	2040	1995	1830	3.20

Figure 9 Waste Management Plan – Ongoing Waste and Recycling Collection Vehicle and Storage Form

Collection	Collection vehicle specifications:							
Vehicle	Length	Width	Height	Servicing height	Weight (loading)	Turning Radius		
						Kerb to kerb 10.3m		
Side	9.5m	2.5m	3.5m	3.5m	23.0t	Wall to Wall 11.0m		
	0.0	0.5	0.4	0.4	00.51	Kerb to kerb 10.5m		
Rear	9.9m	2.5m	3.4m	3.4m	22.5t	Wall to Wall 11.5m		
Front	10.2m	2.5m	4.3m	6.4m	27.5t	Kerb to kerb 12.3m Wall to Wall 13.2m		

Storage of Waste:

1.	Is there sufficient space allocated within each dwelling for one day's waste and recycling?	Yes 🗷 No 🗆
2.	Is there a waste storage area or enclosure provided that can house the total number of bins nominated above? This includes sufficient space for separation of each bin type, movement of bins and access by residents and waste collection vehicles.	Yes ⊠ No □
a	Please advise the dimensions of this area	4.5mmetres (height)Variable (5 areas)metres (depth)Variable (5 areas)metres (width)Approx. total 100m2metres (area)
3.	Is there a compactor provided in the garbage room? Please note compaction units will not be supplied or maintained by Council. Any proposal seeking to utilise a static compaction unit is required to be provided and maintained privately. This requirement would be imposed by way of a restriction on the title of the land.	Yes ⊠ No □ If <i>NO</i> , proceed to question '4'
а	Please detail the type of system (i.e.: carousel, optic sensors, number of bins, automatic bin exchange, size etc?	Carousel system
b	What is the ceiling height of the garbage room?	4.5m metres
c	What is the compactor diameter?	metres
d	Compaction ratio?	
4.	Is there a garbage chute system installed?	Yes ⊠ No □ If <i>NO</i> , proceed to question '5'
a	Is there a waste service room or enclosed chute space provided on each storey?	Yes 🛛 No 🗆
b	Is there sufficient space allocated for recycling in the service room(s)?	Yes 🛛 No 🗆
c	How many storeys will the chute service?	

Developmen	t only)	F
5.	What is the maximum distance from any dwelling to the garbage disposal point (whether disposal is to a bin bay or chute)?	metres
6.	Is there a storage area provided for the storage of bulky waste?	Yes 🛛 No 🗆
а	What are the dimensions of this room?	4.5m metres (height
u	(secure lockable cage)	2m metres (depth) metres (width)
Colle	ction of Waste:	· · · · · · · · · · · · · · · · · · ·
7.	Is there a caretaker on-site responsible for managing waste?	Yes 🛛 No 🗆
•		None
δ.	to kerbside, if applicable?	Contractor convises will be used
	· · · · · · · · · · · · · · · · · · ·	contractor services will be used.
9.	If requesting on site collection of bins, please verify the collection vehicle and that the required specifications can be met?	Side 🗆 Rear 🛛 Front 🗆
а	All vehicle access and loading facilities designed in accordance with the relevant vehicle specification above?	Yes 🗷 No 🗆
b	The waste storage area or enclosure is located at ground level of first underground level?	Yes 🗷 No 🗆
c	If using any of the metal bins, an opened waste storage area has been provided close to an access point where the collection vehicle can drive straight into to access bins?	Yes 🗆 No 🗆 NA 🛛
d	The waste storage area or enclosures opening and access path will have clearance of all vehicles and obstacles and relevant signage to this affect?	Yes ⊠ No 🗆
е	The driveway is of a thickness and structural integrity to withstand the weight loading of the relevant vehicle as specified above?	Yes 🖬 No 🗆
f	The building is designed to ensure all collection vehicles are off the road at all times when collecting bins?	Yes 🛛 No 🗆
g	Collection vehicles can enter and leave the site in a forward direction with minimal or no reversing?	Yes 🛛 No 🗆
10.	What is the maximum distance from garbage/recycling room to the collection point or street frontage?	N/A. Loading bay is used metres
Note:	Council and its contractors are indemnified from and against all ac	tions, claims, demands and
other p injury o Mixe e	proceedings which may be made or recovered in respect of any da or death which relates to carrying out waste and recycling collectio d Residential/Commercial (only)	mage to property, personal n on site.
11.	Do the residential and commercial waste areas have a separate collection point?	Yes D No D
		010767 2014 - Undated Mar 15

Appendix C Volume and Area Estimation

The following estimation method has been applied from the NSW Office of Environment and Heritage Better Practice Guide for Waste Management in Multi-Unit Dwellings:

Waste volume estimation

Estimated volume of waste = $W_{Residential} \times N_{Residential}$

- W_{Residential} = waste volume per residential unit per week = 80L/week
- N_{Residential} = number of residential units

Recyclables volume estimation

Estimated volume of recycling = $R_{Residential} \times N_{Residential}$

- R_{Residential} = recycling volume per residential unit per week = 40L/week
- N_{Residential} = number of residential units

Appendix D Bin manoeuvring equipment

 Table 16 Mobile powered tugs products, capacity and features

Company	Product	Capacity	Features
Movexx	T1000 Basic	1000kg	 Pusher / puller tug Designed for basic tasks and single shift operations
Movexx	Movexx T1000 - Platform	1000kg	 Standard machine designed for single and multi-shift operations Operator stands on platform 24 hour battery life
Моvехх	Movexx T2500	2500kg	Ride-on with seatOperator fatigue is reduced
Materials Handling Australia	Drover Stand on Tug	2000kg	SilentStand on tug with no backVariable speed
Electrodrive	Tug Compact Tug Incliner	500kg	Forward and reverse controlsVariable speed
Electrodrive	Tug Evo	3500kg	Forward and reverse controlsVariable speed

Figure 11 Example mobile powered tugs for bin manoeuvring



MoveXX T1000

Materials Handling Pty Ltd Drover Stand on Tug

Appendix E Organics equipment

Figure 12 Example equipment for on-site organics processing for residential waste

Vermiculture (worm farms)

Vermiculture systems (i.e. worm farms) are containers that provide a habitat for a community of earthworms. The worms transform organic material into useful products such as vermicast (worm compost) and vermi-liquid (liquid extract from a worm farm). Worm farms can require additional materials such as buckets and bags.

Specifications

- Loading: Manual
- Unloading: Manual
- Consumables: buckets, hand tools, sorting table, and bags for casings

Typical materials

Non-woody garden

organics (grass and

Paper and cardboard

(small quantities)

NOT citrus fruit, meat or

Food organics

leaves)

bones

- Working Life: 10-30+ Years
- Power: N/A
- Lateral and Overhead clearances need to be considered in some cases, and are variable

Please note: The outputs of organics processing equipment are subject to EPA regulation regarding the commercial application of waste materials to land.

Relevant standards

AS 4024.1 2006 Series: Safety of Machinery by Third Party Independent verification





Machinery weight (kg)



Processing (kg/week)



Appendix F Bin carousel

Figure 13 Waste carousel plan and elevation view



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CEILING MOUNTED

Appendix G Hoist specification

Figure 14 Example waste hoist specification



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Appendix H Standard Signage

Waste Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the NSW Office of Environment and Heritage (NSW OEH 2008b) and as stated in the DCP (Liverpool City Council 2008).

Standard symbols for use in signage, bin facade and educational materials are promoted through the NSW Environment Protection Authority. They are available for download from the NSW EPA website (NSW EPA 2016b), in black and white and colour versions. The Australian Standard series AS 4123 (Part 7) details colours for mobile waste containers (Standards Australia 2008).

Figure 15 Examples of standard signage for bin uses



Safety Signs

The design and use of safety signs for waste and recycling rooms and enclosures should comply with AS 1319 (Standards Australia 1994). Safety signs should be used to regulate and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Clear and easy to read 'NO STANDING' and 'DANGER' warning signs must be fixed to the external face of each waste and recycling room where appropriate.





(d) Horizontal





Appendix I Information sheet examples for plastics, ewaste and food waste



Source: (NSW EPA 2016a)



Reducing business waste

Materials fact sheet

Electronic waste

Keep your computer from joining millions in landfill

Australia has a growing mountain of electronic waste or e-waste, including computers, mobile phones, TVs, VCRs, stereos, copiers, scanners, printers, fax machines and other electronic devices.

Yet electronic devices contain reusable components and valuable materials which can be recycled.

A survey published in 2010, established that current demand for electronic recycling and reuse services was over 4 million units per year. That is equivalent to around 25,000 tonnes each year.

Electronic waste in Australia is estimated to be growing at more than three times the rate of domestic waste from households and other council waste.

As part of its new product stewardship legislative framework, the Australian government intends implementing 'regulation to support an industry-led scheme' that will collect and recycle televisions and computers.²



Real gold in e-waste

Photo: Kathy Giunta

Electronic waste contains many valuable, recoverable materials such as aluminium, steel and copper. Things like printed circuit boards, cabling, glass and plastics can be used to produce new products.

More than 90 per cent of the material in mobile phones, for example, can be recovered and used for new products. The nickel is recovered for stainless steel products; the small amounts of gold or silver can be reused in jewellery; and the plastics used to make fence posts, pallets and other products.

Be aware some equipment may contain toxic or hazardous components. With all electronic waste and used batteries, some care should be taken with disposal. Seek advice from the manufacturers or a reliable source before recycling.

Simple ways to cut electronic waste costs

Think in terms of the waste hierarchy. How can you avoid, reduce, reuse or recycle electronic waste?

Avoid \rightarrow Do we need it? Reduce Do we need so much? Reuse 🗦 Can we use it again? Recycle 🔶 Can someone else use it or convert it into something new? rtment of the Environment, Water, Hentage and the Arts, National Television and Computer Product Stewardship scheme (2010). A Study of Australia's Curre te Resplicing Infrastructure Capacity and Needs. http://www.environment.govau/settlements/waste/publications/pubs/ewaste-infrastructure.pdf rtment of the Environment, Water, Hentage and the Arts, National Television and Computer Product Stewardship scheme (2010). National Television and Co induity Scheme. http://www.environment.govau/settlements/waste/publications/pubs/reveale.pdf

Source: (NSW EPA 2016a)



Reducing business waste

Materials fact sheet

Food waste

Second largest emitter of greenhouse gases

Power stations are the largest emitters of greenhouse gases in Australia. You may be surprised to learn that our food production, preparation and delivery system is the second largest emitter.

This is because so much energy goes into making food. Soil, water, natural resources and energy are used to produce, harvest, transport, process, package, distribute and market food products. When food is wasted, so are all those resources that went into it. And so is all that money you invest in buying the food.

In NSW, food waste is the second largest commercial and industry waste – amounting to over 300,000 tonnes in Sydney alone¹. Between June and August 2008, it was found that 74 per cent of total food waste in Sydney was wasted before it even got to the consumer².

The benefits of recycling food waste

If you are concerned about your bottom line and the environment, one of the best things you can do is to reduce and recycle food waste.

For every tonne of food kept out of landfill, 0.9 tonnes of greenhouse gases are avoided³.

Simple ways to cut food waste costs

Think in terms of the waste hierarchy. How can you avoid, reduce, reuse or recycle?

 Avoid
 >
 Do we need it?

 Reduce
 >
 Do we need so much?

 Reuse
 >
 Can we use it again?

 Recycle
 >
 Can someone else use it or convert it into something new?

AVOID

Portion your meals and servings appropriately. Downsize rather than supersize when it comes to food. It is best to provide customers with options of serving sizes and side orders, so they can decide how much food they want. Pre-portioning dishes like cake or lasagne prevents staff serving differing sizes and results in left over food being thrown away. Visit **lovefoodhatewaste.nsw.gov.au/business** for more practical tips and ideas to avoid food waste.

DECCW (2009). Commercial and Industrial waste in Sydney-overview. http://www.environment.nsw.gov.au/war/CommercialIndustrialWaste.htm
 DECCW (2010). Audit of Commercial and Industrial waste in Sydney-overview.ifull report. http://www.environment.nsw.gov.au/war/CommercialIndustrialWaste.htm
 Commonwealth Department of Climate Change (2009). Macand Greenhouse.counts (WA) Actaces.

Source: (NSW EPA 2016a)

