

# Multiple Dwelling Development Waste Management Plan Guidelines

A resource for Western Australian Local  
Government and Developers



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## Acknowledgement

These Guidelines have been developed by the WA Local Government Association, with funding from the Waste Authority through the Waste Avoidance and Resource Recovery Account. The Association would like to acknowledge the contribution of a range of stakeholders from Local Government and the recycling and development industries in the development of these Guidelines.

# 1 Introduction

## ***Why was this Guideline developed?***

This Guideline has been developed for two primary reasons, to provide consistent guidance on waste management in relation to multiple dwelling developments and to encourage increased diversion of waste from landfill.

In Western Australia there is limited consistent guidance on and consideration of waste management issues in the design, development, operation and ongoing management of multiple dwelling developments. The absence of consistent guidance in relation to these types of developments had led to a range of issues that affect the ongoing operations of the developments, such as inadequate bin storage areas, difficulty in accessing collection points and illegal dumping.

The WA State Government, has developed a State Waste Strategy 'Creating the Right Environment' which sets ambitious targets for diversion of Municipal Solid Waste (MSW) from landfill; 50% diversion of material presented for collection by 30 June 2015 and 65% diversion from landfill by 30 June 2020. Given the 2009/10 diversion rate for MSW was 36% a concerted and coordinated effort will be needed to achieve these targets. The rates of resource recovery within multiple dwelling buildings are typically lower than the resource recovery rates for surrounding single-dwelling domestic households.

This Guideline is part of a project funded by the Western Australian Waste Authority and developed through the WA Local Government Association. This Guideline will be supported by Local Government requirements, as part of the planning approval process. This Guideline has been developed to provide a consistent reference for architects, developers, building managers and Local Government officers in regard to multiple dwelling developments to assist in ensuring that the basic requirements for collection and access are covered and to encourage the increased diversion of waste from landfill.

## ***What type of development does this Guideline cover?***

This document outlines the main issues to be considered when designing a waste management system for multiple dwelling developments which require planning approval from Local Governments.

For the purpose of this document, the term 'multiple dwelling development' is applied to developments that reflect the R codes definition of multiple dwellings or more commonly referred to as apartments. Within such developments, space for bin storage is limited and standard Local Government collection services may not be readily applied.

### *Mixed-use developments*

The Commercial and Industrial Waste Management Plan Guidelines, also produced as part of this Project, make reference to mixed use developments. The usual practice is that commercial and industrial waste streams and domestic waste streams are stored and managed separately.

## ***What is covered in this Guideline?***

This Guideline covers a range of information in relation to multiple dwelling developments. It covers both the design considerations and the ongoing operation of a development. The Guideline includes:

- Better practice waste management systems: an outline of what a better practice approach is in relation to waste management;
- The importance of Local Government liaison: to ensure that the systems put in place will be usable;
- Waste streams and generation rates: an outline of the type of waste that may be generated through the developments operations;
- General design considerations: such as noise, odour, hygiene, vermin security and health, safety and the environment;
- Waste storage considerations: in particular, the design of bin storage areas;
- Waste collection: an outline of where waste presentation points should be located and access issues;
- Education: the importance of signage and ongoing education; and
- Ongoing management: some of the issues associated with the ongoing management of a development.

### ***How should this Guideline be used?***

This Guideline should be used as a resource for developers when designing developments and considering how the development will operate, including the ongoing management. Appendix 4a includes a simple Waste Management Plan template of issues to incorporate in the development process.

This Guideline should be used by building managers and owners to identify the range of issues which should be included in management approaches for ongoing operations. Appendix 4b includes a Level 1 Waste Management Plan template of issues to consider in the development process.

The Level 1 Waste Management Plan template will be appropriate for most developments however more complex developments (such as mixed use) may require a more in-depth (Level 2) Waste Management Plan. A template for a Level 2 Waste Management Plan is provided in Appendix 5.

The Guideline should be used by Local Governments officers in the assessment of development applications. Appendix 6 includes a checklist of issues to consider during the assessment of a development.

## **2 Better Practice Waste Management Systems**

The adoption of better practice waste management system has a range of benefits including increasing amenity, ease of use, improving environmental performance and promoting appropriate waste management behaviours from residents.

### **2.1 What is better practice?**

The term 'better practice' indicates that the techniques, methods and advice provided are better than that might have been proposed or implemented previously. The term 'best practice' has been avoided as it implies that no further improvement or innovation is possible.

The better practice approach promotes appropriate resident behaviour in relation to waste management, increases the amenity and practicality of waste systems, enhances environmental performance and the reputation of developments with well-managed waste facilities. Early

consultation with Local Government officers and local waste management service providers to discuss specific requirements for local waste services is essential to developing better practice waste management systems. Figure 1 provides an outline of the different stages of planning a best practice waste management system.

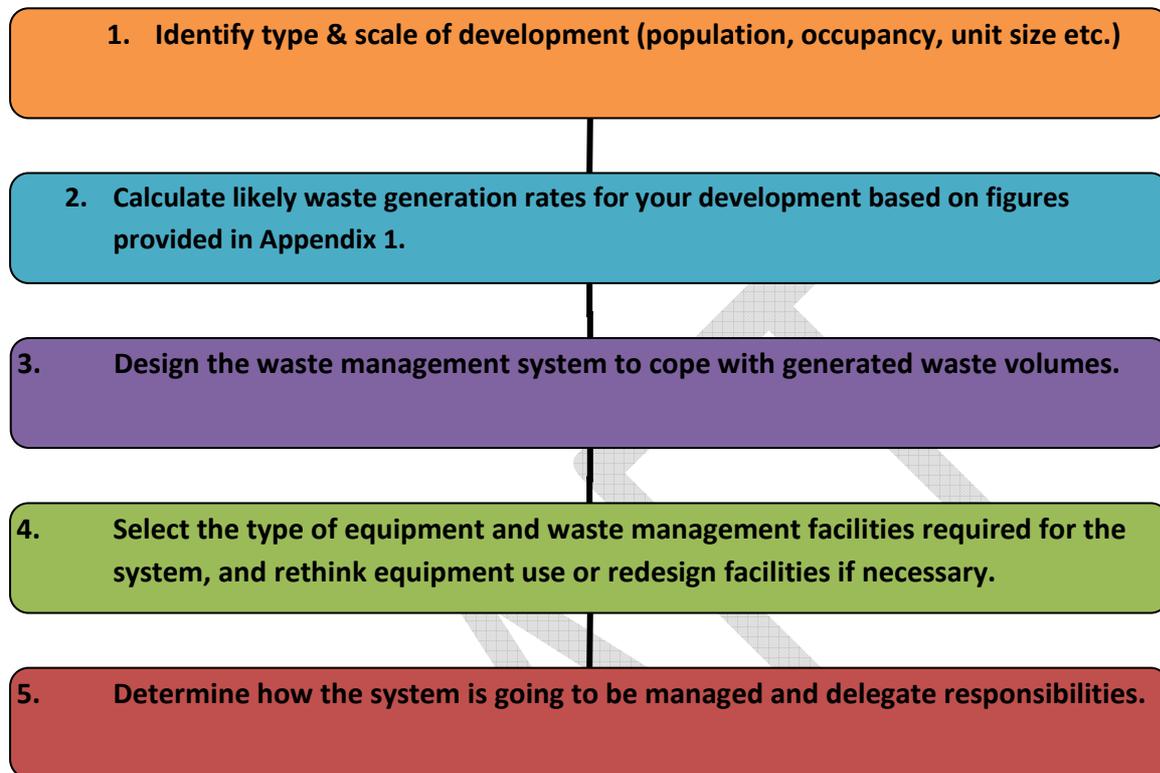


Figure 1: Waste Management System Planning flowchart

## 2.2 Better Practice Waste Management Strategies

The Waste Hierarchy is the broadly accepted approach that is used to develop waste management strategies; the Hierarchy is commonly characterised as ‘reduce, reuse, recycle, dispose’. The Hierarchy rates waste management options from the most favourable – reduce, to the least favourable – disposal and is a tool to assess options in relation to a waste management strategy.

An effective waste management strategy includes all of the elements of the Hierarchy, from identifying what waste generation can be avoided, through to ensuring that any waste generated is appropriately disposed of. The following have been included, to provide some simple examples of approaches that can be taken although not all will be relevant for the multi-residential context:

- **Reduce/avoid:** double-sided printing, electronic filing, provision of reusable cups, provision of electronic hand-driers;
- **Reuse:** encourage residents to swap items within the complex by having a public notice board, donate unwanted items to local schools or charities, encourage residents to return packaging on bulky items to suppliers for reuse;
- **Recycling:** ensure provision of recycling bins;
- **Recovery:** composting of organic material onsite; and
- **Disposal:** for some materials, disposal at a suitably licensed landfill is the only option (e.g. asbestos).

### 3 The Importance of Local Government Liaison

Liaison with Local Government officers is a crucial stage in the development of a better practice waste management system for multiple dwelling developments. Early consultation with Local Government officers enables developers to obtain a better understanding of local waste planning requirements, service delivery options and what is expected as part of new developments. Local Governments are responsible for the collection of municipal solid waste under the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and have a significant role in waste management.

Waste collection services provided can vary between Local Government areas, therefore it is crucial that developers liaise with Local Government officers as early as possible to discuss specific requirements and options for waste management and servicing. The waste management system should be designed to accommodate the intended waste collection service; whether it is undertaken by the Local Government or their nominated service provider.

### 4 Waste Stream Composition and Generation Rates

Within multiple dwelling developments a range of waste materials are likely to be generated. These include general waste, comingled recyclables, organic waste, household hazardous waste and bulky waste. Table 1 shows the various types of waste that are likely to be generated. Appendix 1 identifies likely generation rates for the various types of waste, Appendix 2 identifies some common ways of managing these waste streams and issues associated with their management.

Waste stream	Comment
General waste	General waste usually includes non-recyclable materials, such as non-recyclable plastic packaging, paper packaging contaminated with food waste and organic materials, such as garden trimmings and food waste. Batteries, hazardous waste (chemicals, paints, cleaning products, medicines or flammable liquids) should not be included in the general waste stream.
Comingled recyclables	Comingled recyclables consist of the assortment of recyclable materials generated in households. Materials collected for recycling may vary between Local Governments, but generally include plastic and glass containers, paper, cardboard and steel and aluminium cans.
Organic waste	Organic waste, includes garden waste, food scraps, compostable paper (tissues, serviettes, soiled paper, paper plates, etc.) and can make up a significant percentage of the general waste stream.
Household Hazardous Waste	Household hazardous waste (HHW) is broadly defined as leftover household products that are corrosive, toxic, flammable or reactive. If improperly used or disposed of, HHW can be harmful to human health and the environment. HHW includes chemical waste and other hazardous materials, such as batteries, fluorescent lamps, and gas cylinders.
Bulky Waste	Bulky waste can include old and broken furniture and electronic

	<p>items/white goods and materials generated. Bulky waste can be a significant issue within developments with a high residential turnover, such as rental unit complexes, where tenants are required to dispose of various unwanted household items.</p>
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Table 1: Types of waste generated by multiple dwelling developments.

## 5 Design Considerations

A number of problems can arise from inadequate consideration of waste management in developments. Some of these problems include noise, odour, hygiene issues, vermin, negative impacts on the health, safety, environment and security. To avoid these issues it is vital to consider waste management in the design and planning of multiple dwelling developments.

### 5.1 Noise

The main sources of noise associated with domestic waste management is the emptying of recyclable materials into collection vehicles, vehicle noise and reversing alarms on collection vehicles. Waste is collected at least once per week. In some areas, waste is collected daily and therefore noise can be a significant concern for residents.

Better practice principles that should be incorporated to reduce noise include:

- Locating bin bays and collection points far enough away from residents to reduce the impact of the noise of bin use and waste collection;
- Eliminating the need for collection vehicles to reverse;
- Chutes, if installed, should be well insulated to avoid noise disturbing neighbouring units;
- Select appropriate surfacing materials that will assist in minimising noise for pathways and driveways that bins will need to be wheeled over; and
- Consider how material will be transferred into bins or static compactors at storage points.

### 5.2 Odour

Odour problems can be minimised by having well-ventilated waste storage areas. For enclosed storage and service areas, the air flowing from any storage areas should not exit close to residences. Ventilation openings should be protected against flies and vermin and located as near the ceiling and floor as possible, but away from the windows of dwellings. If a forced ventilation or air conditioning system is used (for enclosed storage areas):

- It should be in accordance with the ventilation requirements of the Building Code of Australia and Australian Standard *AS 1668.2 The use of Ventilation and Air Conditioning in Buildings*; and
- It should not be connected to the same ventilation system supplying air to the units.

### 5.3 Hygiene and Vermin

Waste not sealed in containers attracts vermin and is potentially unhygienic. To minimise the potential for this, keep waste collection and storage areas free of clutter and dumped waste, do not allow bins to sit open for extended periods of time and As far as possible, prevent vermin getting into waste collection and storage areas.

Communal bin storage areas need to be easy to clean, with access to water (a tap and a hose) and correct drainage to the sewer. The disposal of water from washing bins and/or waste storage areas to stormwater drains should be avoided, wash-down areas having drainage connected to the sewer. The frequency of cleaning will be dependent on:

- The time of year: in the summer more frequent cleaning may be required;
- Whether compostable bags (organic waste) or newspaper or liners (general waste) are used to contain food waste: bags and liners prevent food waste from sticking to the bins and reduce the need for cleaning;
- The location of the bins; and
- The procedures for cleaning the bins: whether they can be cleaned on site (e.g. the building caretaker) or need to be collected and moved to another area for cleaning e.g. by a bin washing service).

Drains to sewer should be located under cover to prevent rainwater inflows. Ideally, having covered floor junctions at walls helps with cleaning and avoids the build-up of dirt/spills. To maintain hygiene:

- Assign responsibility for keeping communal areas clean; and
- Wash both bins floors and walls of waste bays and rooms regularly.

#### **5.4 Health, Safety and Environment Risks**

Waste management systems and services should be designed and operated in a way which prevents or minimises any potential risk of injury or illness associated with the collection and disposal or recovery of materials. This includes potential risks to:

- Residents or tenants using the service;
- Building management or cleaning staff;
- Local Government or waste service collection staff; and
- Other people engaged in or affected by the waste management plan.

Although waste collections and service provision will be the responsibility of the Local Government or their contractors, developers and their design teams must consider the potential impact of a proposed design on the Local Governments' ability to safely service the development. Collection methods and systems must comply with relevant Occupational Health and Safety Legislation and requirements, most notably the *Occupational Safety and Health Act 1984* and WorkSafe requirements. A preliminary Occupational Health, Safety and Environment (OHSE) risk and hazard analysis should be undertaken during the design phase to identify any potential risks to health and safety associated with the proposed services and design layout. This will assist the early identification of risks, and allow the modification of the proposed design to eliminate or minimise likelihood of human injury or damage to property and equipment.

Potential OHSE risks associated with waste management include:

- Manual handling injury;
- Damage to buildings and infrastructure;
- Cuts and lacerations from sharp materials;
- Biohazards;
- Dust;
- Odours;
- Vermin;
- Collection staff working in confined spaces (between truck and buildings); and

- Conflict between building design and collection vehicles.

## 5.5 Security

Another issue to be considered in the design of the development is the opportunity to reduce the potential for illegal activities. Crime prevention through environmental design (CPTED) principles can be applied to the design of bin stores for example. The four CPTED principles are:

- *Surveillance*– Allow people to see what others are doing by ensuring clear sightlines, selecting appropriate landscaping and providing adequate lighting.
- *Access control*- Establish physical and symbolic barriers to attract, channel or restrict the movement of people.
- *Territorial reinforcement*- Create a sense of community ownership to promote use and discourage antisocial behaviours.
- *Space management*- Manage and maintain spaces to ensure that space is appropriately utilised and well cared for i.e. repair or removal of vandalism and graffiti, replacement of burnt-out lighting and removal of litter.

As far as practicable, the design of waste storage areas should:

- Maximise every day surveillance by other residents; and
- Allow and encourage easy access for residents and building management whilst barring access by the general public.

Some examples of how this could be done include:

- Locate the bin storage area away from public thoroughfares;
- Design bin storage areas that can be locked; and
- For communal bin areas, ensure they are sufficiently open and well lit to allow their use after dark.

### Summary of better practice considerations in Design

- ✓ By designing the waste management system in line with better practice considerations, significant issues with noise, odour, hygiene, vermin, security, health, safety and the environment can be minimised;
- ✓ Noise considerations include the type of waste being generated and the collection times and locations;
- ✓ Odour issues arise predominantly from green and organic waste, minimising these wastes and managing them appropriately will significantly reduce their impact;
- ✓ Vermin and hygiene issues are often associated with waste storage areas not being kept clean, to avoid this ensure the areas are designed to be easy to clean and that responsibility to keep them clean is assigned;
- ✓ The Health, Safety and Environmental impacts of waste management result from how the waste is stored, handled and dispose of; and
- ✓ Illegal activities such as dumping of waste can be minimised through careful design and placement of waste storage facilities.

## 6 Waste Storage – Bins, Containers and Waste Handling Equipment

In developing sufficient waste storage, there are a number of factors that need to be considered, including how the waste will be stored and what type of bin storage area will be used. Appendix 2 contains more information on the range of waste management equipment which is currently available, including dimensions and volumes of waste storage.

### 6.1 Bins and Containers

The bins used for general waste, recycling and organics should be acceptable to, or provided by, the Local Government or the Local Government waste contractor. The bins should be fitted with permanent lids and conform with *Australian Standard for Mobile Waste Containers (AS 4213)*. The standard bin type used for domestic waste collections in Western Australia is the two wheeled mobile garbage bin (MGB), referred to colloquially as 'wheelie bins'. MGBs are moulded plastic containers incorporating 2 or 4 wheels, a close-fitting lid and handles for manual transport and manoeuvring. They are manufactured in a variety of standard sizes and are designed to be lifted and emptied by purpose-built trucks.

The size of MGB's range from 80L up to 1,700L capacity; the most common size for domestic use in WA is 240L. MGBs of 240L capacity are a very versatile and flexible container. Most are produced to a standard design which allows for small quantities of waste to be moved easily by hand. Multiple bins are generally used to accommodate the higher volumes of waste generated by multiple dwelling developments, however larger bin sizes may be used.

### 6.2 Bin Storage Area – General Considerations

Careful site planning is required in the early design stage in order to prevent future ad-hoc bin storage within the development, which can detract from visual amenity, be impractical and potentially hazardous (Figure 2). For smaller scale MDDs, such as walk-ups and unit complexes, waste will be required to be transported by residents or tenants directly to a communal bin store located on the ground floor or at the base of the development. Developers will need to work closely with the Local Government to identify which option is best suited to their proposed development.

Some general considerations in the design and construction of waste rooms and communal bin stores include:

- The bin store must be large enough for the bins to sit next to each other, not behind each other as residents may not take responsibility for rotating bins;
- The height of the bin store must be sufficient for the residual waste bin lids to be opened;
- Locate bins on-site (not on the verge) and ensure they are screened from any street frontage;
- To address security concerns, developers may consider an open rail gate with a welded mesh on the back of it for internal bin rooms so that residents can see inside the bin room before entering it from the outside. External bin stores could be designed to be only slightly higher than the bins themselves (approximately 15cm higher) and have no roof so that residents can see who is inside the bin store before entering;
- Adequate lighting needs to be provided to allow the usage of the bin store after dark;
- Internal waste rooms should be well ventilated and have a smooth easily cleanable floor;

- Suitable drainage, with water discharging into a sewer drain, must be installed to allow the washing of bins;
- A tap with hose should be available for use by residents/cleaners to wash out domestic bins and transport containers; and
- CCTV could be installed in new and refurbished developments to deter illegal dumping, especially in places that are particularly vulnerable to illegal dumping. CCTV should also be fitted inside the bin room.



Figure 2: Bins stored within driveway, the storage of bins in this location impacts visual amenity and creates a traffic hazard for motorists, as well as a danger to residents needing to access bins to deposit waste and recyclables.

### 6.3 Bin Storage Area – Size

To calculate the amount of space required for bin storage, consideration should be given to the waste generation rates likely, the storage equipment (bins) to be used and the type and regularity of the collection service/s provided. Appendix 1 provides some figures to help calculate generation rate, Appendix 2 provides the dimensions of the various bins. Through liaison with the Local Government, the service type and regularity can be determined.

When calculating storage space requirements, consideration should be given to potential future uses associated with the building and expansion potential, and how these will affect waste generation rates and subsequent storage requirements. Flexibility should be incorporated into the design of the waste management system to enable retrofitting, such as designing access paths and doors which can accommodate larger sized bins or additional bins for different waste types.

### 6.4 Bin Storage Area – Design

The provision and location of adequate storage areas both within and external to dwellings is a key element of better practice systems. Within a development, the disposal of general waste and recyclable materials should be equally convenient for users, with general waste bins placed adjacent to recycling bins as opposed to being situated in different locations. Waste systems should be

designed so that its use and operation is easily interpreted by users, with adequate signage and clear labelling.

### **Within Residences**

Designers should aim to incorporate sufficient space within the kitchen, laundry room or other convenient location within the dwelling for the temporary storage of accumulated waste and recycling. Space should be sufficient to allow for the separate storage of recyclables and general waste, as well as organic waste where applicable.

Possible ways to encourage recycling and minimise contamination include:

- Provision of adequate internal storage space within dwellings (kitchen or laundry) to accommodate the temporary storage of at least 2 days' worth of general waste, organics (where applicable) and recycling. This should comprise:
  - A minimum 30L general waste bin;
  - A minimum 30L comingled recyclables bin; and
  - A 10L organic waste bin (where applicable)
- Provision of reusable, robust containers to residents to assist them in transporting recyclable materials from their dwelling to recycling bins without resorting to plastic garbage bags e.g. reusable, washable tote-bags;
- Fostering a sense of ownership, responsibility and accountability by numbering bins (where applicable); and
- Posting signage in public areas of the building to educate residents/tenants about the location and use of the waste management system, including what materials are suitable for recycling and composting.

### **External**

Bin storage areas should have the capacity to store at least one weeks' worth of waste. Increased frequency of service should not reduce the need to provide adequate bin storage space for this volume of waste. This is to ensure that there is sufficient capacity to store accumulated waste in the event of a pandemic, natural disaster, fuel shortage, industrial action etc.

Storage areas should be out of sight or well screened from the street. Bin storage areas should not detract from the aesthetics of the development and should blend in with surrounding structures and landscaping.

Locating storage areas out of sight from public thoroughfares improves safety and reduces the potential for vandalism. Storage areas should be located an appropriate distance from dwellings. Locating bin stores and collection points away from private residences will reduce the impact of noise during bin use and waste collection, as well as minimise any potential impacts from odours.

## **6.5 Bin Storage Area – Use**

Waste and recycling storage facilities should be located in positions that:

- Permit easy, direct and convenient access for the users of the facility;
- Permit easy transfer of bins to the presentation point (where required);
- Permit easy, direct and convenient access for collection service providers;
- Are well screened and do not reduce amenity;
- Are secure and provide protection against potential vandalism;
- Reduce potential noise pollution and disturbance of residents; and
- Are close to building exits.

Where bins of up to, and including, 360L in capacity need to be wheeled to the collection point by residents (such as within unit complexes and town houses):

- The distance should not exceed 75m in all circumstances;
- For aged persons or persons with a disability, the distance should be limited to 50m;
- The bin transfer grade should not exceed 1:14; and
- Bins should not need to be wheeled over steps (neither up nor down).

For bins greater than 360L capacity, if relocation of bins is required:

- Bins should not be wheeled over steps (neither up nor down).
- If less than or equal to 1.0m<sup>3</sup> in capacity, bins should not need to be wheeled more than 5m from the interim storage point to the collection point.
- If greater than 1.5m<sup>3</sup> in capacity, manual manoeuvring of bins should be avoided wherever possible. Where it cannot be avoided (for example if bins are stored in a room or enclosure), the bins should not need to be wheeled more than 3m from the interim storage point to the collection point; and
- The bin-transfer grade should not exceed 1:30.

## 6.6 Bulky Waste Storage

Although many Local Governments provide a bulk waste collection service once or twice a year, higher turnover of residences in multi dwelling developments may necessitate that this material is stored onsite for some time.

Bulky waste can be a significant issue within developments with a high residential turnover, such as rental unit complexes, where tenants are required to dispose of various unwanted household items. Bulky items may be collected by either independent waste contractors or the Local Government/the Local Governments contractor. However, the types of bulky waste service offered vary between Local Government areas, and developers are strongly encouraged to liaise with Local Government officers in relation to bulky waste management as part of the design and planning process. The area allocated for the temporary placement/storage of bulky waste should ideally be situated within or adjacent to the bin storage area. When allocating space for the storage of bulky items, consideration should be given to the intended method and frequency of collection; with less frequent collections requiring a larger storage area.

### Summary of better practice considerations waste storage areas

In general, better practice bin storage areas should:

- ✓ Have adequate storage space for required bins (based on the building size and the applicable waste and recycled material generation rates outlined in Appendix 1);
- ✓ Be designed with some flexibility in relation to size to ensure future uses for the development are not limited;
- ✓ Permit easy, direct and convenient access for residents, caretakers and other the users of the facility, whilst restricting access to unauthorised persons;
- ✓ Permit easy transfer of bins to the presentation point if required, with doors and access wide and high enough to allow easy manoeuvring of any stored bin;
- ✓ Permit easy, direct and convenient access for collection service providers;
- ✓ Are integrated into the design of the overall development and do not affect visual amenity; and
- ✓ Bulky waste storage and collection has been considered.

## 7 Waste Collection

### 7.1 Waste Presentation Point

Presentation points are the locations in which the bins containing waste and recyclables from the development are presented for collection by service providers. In larger developments, residents should not be responsible for the presentation of bins for collection, as there is usually no individual ownership of bins. In these type of developments a caretaker or equivalent should be responsible for putting the bins out for collection. Once the bins have been emptied it is the responsibility of the caretaker or equivalent to take the bins back to the storage area. The presentation area should be located as close as possible to the storage area.

Where 240L bins are presented along the kerbside for pick-up, 1 square metre should be allocated for each bin so as to enable the lifting of bins. The presentation of bins larger than 360L is not generally permitted by Local Government. Not all Local Governments support the establishment of kerbside bin presentation areas for multiple unit developments, and developers should check with Local Government officers regarding specific local requirements and service options.

The identification of a suitable location for the presentation of bins for collection is a crucial aspect for any development (see Figure 2 and 3). It is of particular importance for large developments requiring a large number of bins, developments with limited access and developments with specialised servicing requirements e.g. compacted waste or underground bins. Collection requirements should be discussed with the Local Government and/or waste collection contractors during the early stages of design.

Some better practice design and location considerations for presentation points include that these points should:

- Not be situated near intersections, ramps, round-a-bouts, pedestrian crossings, or on busy roads or in narrow lane ways;
- Not be located near building awnings, overhead wires, tree canopies or other overhead structures;
- Be clear of air-conditioning and other service ducts and pipes, sprinklers, CCTV cameras, movement sensor, smoke detectors and other ceiling fixtures if located inside a building;
- Be on a level surface;
- Have an access-way rated for use by heavy vehicles;
- Have enough room for bins to be manoeuvred by the driver for servicing (if necessary);
- Be away from public areas, be well-clear of vehicle, pedestrian, public, staff and visitor traffic areas;
- Not be restricted by parked cars or vehicle loading or unloading bays;
- Not be restricted by bollards, signs, plants, bins, seats or other street furniture;
- Not require vehicles to reverse; and
- Be accessible during collection times and not located behind locked gates.

Cars parked along the street and bins placed two or more rows deep are often an obstacle for safe and efficient kerbside collection, as they require collection operators to get out of the collection vehicle and manually move bins to an appropriate position for collection. They also create amenity issues for residents, can impede pedestrian access and can be a traffic hazard for motorists (Figure 5).

There are two general types of waste collection vehicle, side arm lift and back lift. For side arm lift, 240L general waste and recycling mobile garbage bins are lifted and returned to the ground in an outward arc movement which extends 2,270mm from the left-hand side of the collection truck. Sufficient clearance must be provided behind the pick-up point to allow for this arc movement and avoid any damage to property and/or bins. Collectors need to be able to move the bins from the collection point to the collection vehicle as quickly as possible, preferably with no or limited manual handling. The collection point should facilitate collection operations to be conducted on a level surface, away from vehicle ramps or steep gradients.

For back lift, where the MGB's will be collected from the kerb, there should be sufficient space on the street for them to be lined up neatly in (preferably) a single row along the kerb. The collection point should not be located within the minimum road pavement width (Figure 3). For developments consisting of 10 or more dwellings in which 240L bins are presented at the kerbside, hardstand bin pads or pick-up points are a good way to ensure the collection runs smoothly (Figure 4). The dimensions of the bin pad(s) should be determined by allowing for 1 square metre for each bin.



Figure 3: Inappropriate presentation of 240L MGBs on road pavement.



Figure 4: Hardstand bin pad adjacent to public roadway, provides a good example of a presentation point.



Figure 5: The kerbside presentation of numerous bins from multiple dwelling developments can substantially impact the streetscape.

Where developers have reached an agreement with Local Government for onsite collection, or where an independent waste contractor will be engaged to service bins onsite, presentation points should be designed and situated so as to facilitate safe and efficient servicing.

## 7.2 Access

Waste collection trucks are heavy vehicles and any areas these vehicles are using should be designed to the relevant specifications to ensure the vehicles do not unduly impact on the roadways. Designers are encouraged to consult with the Local Government and other relevant authorities prior to the design of roads and access points to ascertain specific requirements for the proposed development.

For developments with internal road access, the access road must be capable of safely accommodating these waste collection vehicles. Internal road pavements must be constructed to local road pavement standards and crossovers constructed to commercial grade. The minimum pavement width for two-way traffic should be no less than 5800mm and no less than 3600mm for one-way traffic. For access, a minimum clearance height of 3,650mm is required and for servicing a minimum clearance height of 4,150mm is required. A circular road pattern with no or minimal requirements for reversing manoeuvres are preferred. Drive-in and drive-out in forward gear is highly desirable and, depending on the site, may be mandated by the local Government. Where this is not possible, the site layout must allow for the collection vehicle to manoeuvre in a hammerhead T form (refer to Appendix 2). Turning circles and/or turn-around bays should be designed to accommodate a 23 tonne truck of 6 x 4 configuration, with an overall length of 9,600mm, a nominal wheel-base of 5,200mm, front overhang of 1,500mm and a rear overhang of 2,900mm. Typical turning circles should be a minimum 19m diameter over tyres. Other possible turning configurations may be considered appropriate, and should be discussed with Local Government officers.

Factors to be considered in design include:

- Gradients for turning heads;
- Longitudinal road gradients;
- Horizontal alignments;
- Vertical curves;

- Cross-falls;
- Carriageway width;
- Verges;
- Pavement widths;
- Turning areas (see below);
- Local area traffic management requirements (for example speed humps);
- Sight distance requirements;
- Clearance heights (for example a vertical clearance of 6.5m is required to load front-lift vehicles);
- Ensuring the maintenance of a 45° line of sight for service vehicles at entry/egress points;
- Manoeuvring clearance; and
- Road strength (industrial-type strength pavement required, designed for a maximum wheel loading of seven tonnes per axle to accommodate garbage and recycling collection vehicles).

A 2m wide clear area must also be established between the presented bins and the collection vehicle to enable safe access and pick-up of bins by waste staff.

### **7.3 On-site Collection**

If a collection vehicle is required to drive onto a private road or private property, the driveway and road need to be suitable for the collection vehicle in terms of strength, width, geometric design and height clearance. The access points and collection area should be free from overhead obstacles and of an appropriate gradient. When making an on-site collection from within a building, the 'clearance height' should be clear of any air conditioning ducts, sprinklers or other potential obstructions. The relevant heavy vehicle standards should be incorporated into the development design.

Where on-site collections have been negotiated with the Local Government service provider, an indemnity will be required to ensure that the Local Government or their contractor are not held responsible for any damage caused by servicing (Refer to page 21 for more information on indemnity agreements). Where Local Government services agree to service gated developments, access to the site must be provided at a predetermined time window as advised by the Local government on the assigned collection day. The body corporate must nominate a representative who will be responsible for opening and closing the gates at the required times. Given the increasing number of multiple dwelling developments in Local Government areas, it is unlikely that the Local Government will accept keys, swipe cards, pin numbers or any other such mechanisms to gain access to private property. Security gates are to be located approximately 10m inside the lot boundary to accommodate waiting collection trucks, preventing obstruction of the roadway and footpath. The walls and or dividing fences within the vicinity of the must be of masonry construction, as colour bond or fibre cement fencing is easily damaged by machinery.

## Summary of better practice considerations waste storage

To ensure that waste management systems are easy to use and practical:

- Waste presentation points should be located as close as possible to the storage point;
- The route from storage to presentation point should be, as short, flat and easy to navigate as possible;
- Access to the waste presentation points for collection vehicles should not be in high traffic areas and should focus on a 'drive in, drive out' design;
- For those using the waste management systems, the location of storage points should be convenient and well signed to ensure the system is used correctly; and
- If Local Governments are undertaking 'onsite' collections special considerations are needed.

## 8 Education

### 8.1 Signage and Education

Ongoing education, to support the waste management service, is one of the most important factors in encouraging residents to continue to utilise services and systems as originally intended. Some of the education requirements for multiple dwelling developments are undertaken by Local Government.

Educational signage should:

- Clearly identify what items are and are not accepted in the general waste and recycling systems. If signage within the bin store is not possible due to space or other restrictions, bin stickers may be appropriate (Figure 6).
- Outline appropriate waste management behaviour i.e. placing refuse/recyclables inside as opposed to adjacent to bins, placing mixed recyclables into the bin loose (not in a plastic bag), closing bin lids etc.

Where the strata body/building management holds tenants' induction schemes, these should include the use of waste and recycling facilities. The strata body/building management, in conjunction with the Local Government, should issue a leaflet on the correct use of the waste and recycling facilities and the materials recycled. Tenants' handbooks should include a section on the correct use of general waste and recycling facilities.

Ensuring education is 'ongoing' is beneficial because it tackles the transient nature of residents and differences between different Local Government services. All waste and recycling bins or receptacles should be clearly and correctly labelled and signage should be erected in bin storage areas to instructing residents as to the correct separation of recyclables from general waste.

Any hazards or potential dangers associated with the waste facilities, including those from the use of any waste handling equipment, should also be clearly identified. It is recommended that building managers post information in communal areas which clearly identified the relevant points of contact regarding recycling and/or other services within the development. As part of the ongoing education program, welcome packs should be produced and provided to all new residents. These packs should contain information outlining the developments waste management system, required actions and appropriate waste management behaviours.



Figure 6: Contaminated comingled recycling 240L MGB with educational sticker inside lid.

### Summary of better practice for education and signage

To ensure that waste management systems are easy to use and practical:

- Signage should be clear and provide instructions on how to use the waste management system; and
- Education should be ongoing to ensure that even if tenants change, the waste management system still functions.

## 9 Ongoing Management

Ongoing management of waste and recycling systems in multiple dwelling developments is imperative to maintaining amenity, maximise safety for residents, caretakers and collectors, maximise resource recovery and facilitating the efficient servicing of the development. Active caretakers are vital for effective ongoing management in large developments. Ongoing management is required to monitor resident behaviour and identify requirements for further education measures. Negative behaviour, such as dumping waste and recyclables on the floor rather than in bins, must be addressed quickly by management. A prompt response is necessary to prevent the spread of negative behaviour and to maintain the amenity, access and convenience of services to others. It is important to establish and delegate responsibility for the tasks involved in ongoing waste management, including:

- Moving bins to and from the bin storage area to the presentation point (if required) on collection day;
- Washing bins and maintaining storage areas;

- Arranging for the prompt removal of dumped waste;
- Displaying and maintaining consistent signs on all bins and in all communal storage areas;
- Managing communal composting areas (if applicable); and
- Ensuring all residents are informed of the general waste, recycling, organics and bulky waste arrangements.

The size of the development will influence the responsibility for ongoing management and maintenance of bins. Active caretakers are recommended for all developments, particularly those with bin storage areas, and are considered vital for effective ongoing management in large (in terms of scale and number of dwellings) developments. Conditions of consent can require that a development comply with the submitted and approved Waste Management Plan. If a caretaker is required, this may be detailed in the Waste Management Plan and, if so, employment of a caretaker may form part of the conditions of consent, which must be adhered to.

## **9.1 Contracts & Agreements**

The structure of service contracts plays an important role in ensuring efficient servicing of multiple dwelling developments. Indemnity and waste service flexibility are two important contract issues that should be considered in relation to deciding an appropriate better practice system for your development. It is important to liaise with Local Government officers as early as possible to identify potential servicing issues.

### **Indemnity**

Where collection vehicles may be required to enter private property in order to service bins, a management agreement between the strata manager and the Local Governments collection service will be required. Such agreements would be required as part of the approvals process and Local Government services may refuse to enter private property if such an agreement is not in place. This agreement should include a carefully worded indemnity clause to protect the service provider from any liability associated with loss, damage or claims caused directly or indirectly to any person or property by, through or in connection with the waste removal Services or Equipment. The indemnity clause should be included on the relevant titles within the development, as well as any subsequent strata titles, to ensure that it persists in perpetuity.

### **System Flexibility**

Waste management systems should be designed to accommodate Local Government provided collection services. Some Local Governments may only be able to offer multiple dwelling developments the same (or similar) services as those offered to single dwellings. In many cases, particularly for medium to high-rise developments, the efficient provision of cost-effective waste and recycling collection services for multiple dwelling developments may require using an alternative service option, for example bulk bins or underground systems. To enable better practice waste management in multiple dwelling developments, proponents and their designers should liaise with Local Government officers in relation to the waste and recycling service options available and whether they are suitable for the proposed development. In order to reduce the potential risk associated with conflict between building/development design and local Government waste collection services, proponents are strongly encouraged to over engineer for waste collection services. This means providing additional space for extra bins in the future as well as ensuring that the largest collection vehicles can service the site. By catering for larger collection trucks, developers will also ensure that the site can also be safely accessed by emergency service vehicles.

## 9.2 Contingency Planning

Waste management systems for multiple dwelling developments can be very complex, with a suite of equipment and individuals required to work cohesively to ensure that waste is managed effectively. The failure of any individual system component can easily result in the failure or shut-down of the system and so contingency planning is required to adequately plan for any accidents or issues which may arise and ensure that they are dealt with quickly and efficiently. System designers must consider the consequences of equipment failure, such as the breakdown of a compaction unit, or failure or inability of the service provider to empty bins.

### **Summary of better practice considerations ongoing management**

For ongoing management, the aim is to ensure that the maximum amount of material is recovered and waste to landfill is minimised. Some of the key better practice activities associated with this are:

- Put a contract in place which takes into account waste generation and type;
- Manage residents and provide information on the waste management system in place; and
- Monitor the implementation of the contract to ensure services are meeting needs and the waste management system is being used correctly.

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## Appendices

### Appendix 1- Waste Generation Rates

A rough guide to domestic waste generation rates for multiple dwelling developments is provided in Table 2. These generation rates have been developed through consultation with Local Governments in Western Australia.

Waste Stream	Dwelling Size	Waste Generation Rate/Storage Requirement
<b>General waste</b>  <i>*Where separate organic/food waste collection service is provided, these figures may be reduced.</i>	1 bedroom	80L/week*
	2 bedroom	160L/week*
	3+ bedroom	240L/week*
<b>Comingled recycling</b>	1 bedroom	40L/fortnight
	2 bedroom	80L/fortnight
	3+ bedroom	240L/fortnight
<b>Organic/food waste</b>	1 bedroom	40L/fortnight
	2 bedroom	80L/fortnight
	3+ bedroom	120L/fortnight

Table 2: Waste generation rates

### Appendix 2 - Waste Management Equipment

#### Bins and Containers

Mobile garbage bins are available in a variety of sizes, from 80L up to 1,700L capacity. The dimensions of some commonly available wheelie bins are outlined in Table 3 and 4.

Bin capacity	80L	120L	140L	240L	360L
Height (mm)	870	940	1065	1080	1100
Depth (mm)	530	560	540	735	885
Width (mm)	450	485	500	580	600
Approximate footprint (m2)	0.24	0.27	0.27	0.43	0.53

Table 3: Standard MGB dimensions

Bin capacity	660L	770L	1,100L	1,300L	1,700L
Height (mm)	1250	1425	1470	1408	1470
Depth (mm)	850	1100	1245	1250	1250
Width(mm)	1370	1370	1370	1770	1770
Approximate footprint (m2)	1.16	1.5	1.7	1.21	1.27

Table 4: Typical larger MGB dimensions

### Chutes

Chutes are only suitable for general waste, and while they may significantly increase the ease of domestic waste disposal, their use is not in accordance with the better practice principle of maintaining equality between the ease of recycling and general waste disposal. The use of chutes for the collection of general waste has proven to be problematic, with elbows designed to reduce the velocity of deposited waste tearing open bin-liners, resulting in food waste, oil and grease accumulating on the insides of the chute. This accumulated grease and grime is very difficult to remove and can result in serious odour, vermin and air-borne disease issues. Dry waste material, such as paper, also adheres to this material, creating a potential fire hazard. If chutes are desired, designers should ensure that they are designed and located so that they may be co-located with recycling and organic waste (if applicable) bins.

Chutes are only suitable to transfer general or residual waste and are not suitable to transfer recyclables. Firstly, the drop generally results in the damage, or even destruction, of the recyclable material – particularly glass. Secondly, cardboard could easily become stuck in the chute and cause a fire hazard. Other recyclables, such as paper and plastics, are also flammable. Therefore, having large quantities of recyclables stored at the bottom of a long shaft that runs the height of the building could constitute a fire hazard. Chutes should be designed to reduce noise and fire risks associated with their use. They should be cylindrical in section to avoid waste being caught within the chute, and with a diameter of 500mm or greater. A service room (or compartment) needs to be provided on each floor of the development to allow access to the waste chute. Chutes should not open onto any habitable or public space. Hopper doors are to have an effective self-sealing system. Chutes should terminate in a waste and recycling room and discharge directly into a receptacle or waste compactor in a manner that avoids spillage and overflow. Chutes should be completely enclosed in a fire-rated shaft constructed of an approved material and fitted with sprinklers in accordance with the Building Code of Australia. See manufacturer(s) for exact specifications.

### Service Lifts

A service lift (or service elevator) may be appropriate in place of a waste chute in developments where a caretaker will be employed. A service lift is dedicated to the transport of waste and recycling containers and other equipment required for the operation of the development. Provide an interim storage room on each floor of the development to allow residents to store waste and recyclables. Residents place their waste and recyclables in bins provided and these are transported daily by the caretaker to the waste storage room. Each waste room needs to be designed with sufficient space for the storage of one day's garbage and recycling for all residents on that level. If the use of a goods lift is proposed, it must be of sufficient size to accommodate the bin as well as the porter. For larger developments, the lift should be of sufficient size to accommodate multiple 240L

bins. It is accepted that the construction of lifts can add significantly to construction costs. However, it is recommended that's service lifts be incorporated into building design where the additional cost can be justified.

### Compactors

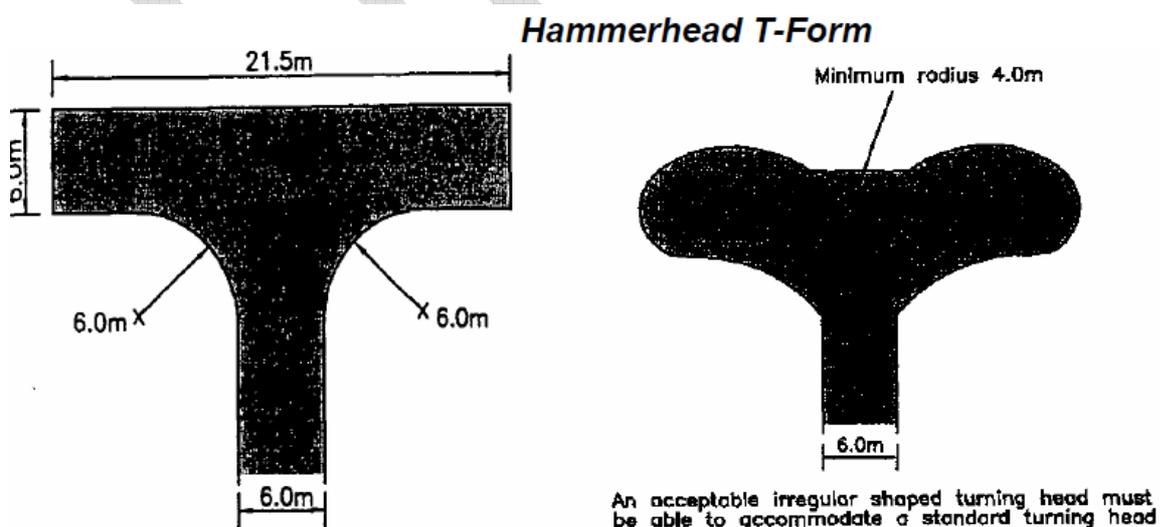
Compactors are used to compress the waste into smaller collection containers. The use of compactors for the recyclable waste stream may not be appropriate, as this reduced the ability for the recyclable materials to be sorted at the materials recovery facility. Similarly, compaction is not appropriate for organic waste streams.

The compaction ratio for general waste is typically set at around 2:1. Higher ratios are not used as they may result in heavier bins, causing occupational health and safety problems, mechanical damage and may break recyclable materials. They may also cause compacted waste to get jammed in the base of the bins, making it difficult to empty the contents. Better practice compaction systems compact directly into a MGB, reducing the requirement to manually load the compacted waste into bins. Compactors require regular maintenance. In particular, systems fed from a chute can be prone to blockages or failure of the 'electronic eye', which can result in garbage overflowing or backing up the chute. The 2:1 compaction ratio will halve the requirement for waste storage bins. Compactors should be designed to accommodate wet waste in order to prevent any issues associated with the production of liquor during compaction. Caution is required with the compaction of waste to ensure that the weight of the MGB does not exceed the Local Governments maximum weight for pick-up.

### Bin Lifters

If there is a requirement to empty MGBs of waste into bulk skips or compactors, a hydraulic bin-lifting device should be provided to eliminate the need for manual lifting. Bin lifters are available for a variety of tipping applications, including various size bins and containers, and designed to tip into containers of various heights. They can be battery powered or connected to mains power. Some models also come with safety cages.

### Vehicle Access/Turning Circle Specifications

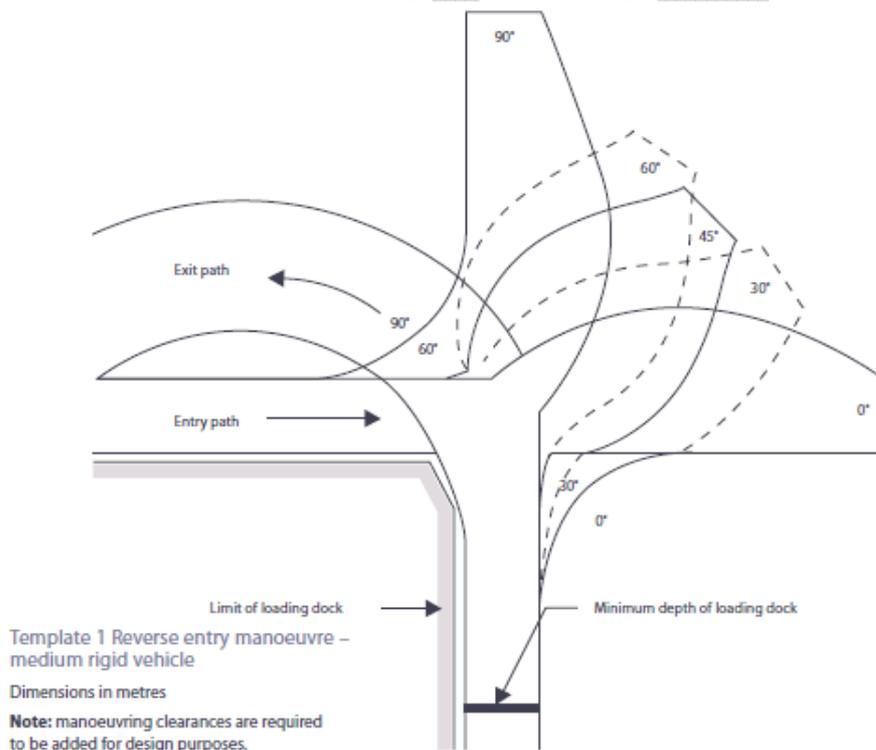


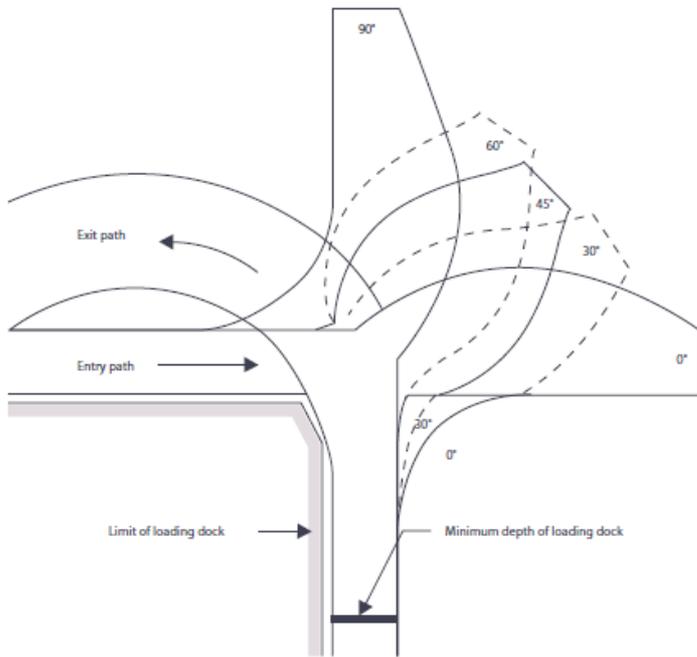
## Specifications

Turning circle templates and reverse entry templates for medium and heavy rigid vehicles are provided below. Turning path templates – should be used in the design of access driveways and circulation roadways, and in checking on the path of vehicles leaving service bays. Reverse entry templates – should be used in the design of service bays and service area aprons to accommodate the backing manoeuvres required to undertake a Y-shaped turn. These templates can be printed and copied onto a transparent medium or imported into computer drawing packages to check vehicle paths on intersection layout drawings. These templates are applicable for the following vehicle dimensions:

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

Templates have been sourced from AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities. Please refer to this standard for the latest vehicle access requirements. This standard is available from SAI Global ([www.saiglobal.com](http://www.saiglobal.com)) through its web shop.

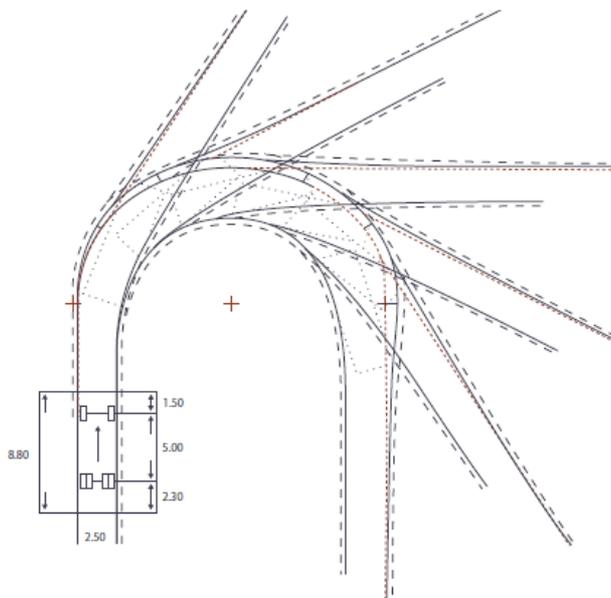




Template 2 Reverse entry manoeuvre – heavy rigid vehicle

Dimensions in metres

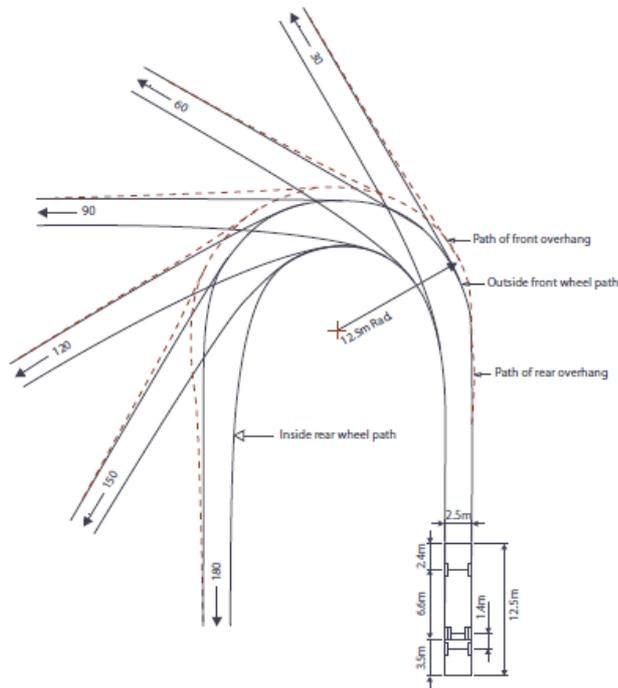
**Note:** manoeuvring clearances are required to be added for design purposes.



Template 3 Turning path template – medium rigid vehicle

Dimensions in metres

Minimum radius turn 10m



Template 4 Turning path template – heavy rigid vehicle  
 Dimensions in metres  
 Minimum radius turn 10m

### Appendix 3 - Waste Management Systems

The Waste Authority has recently released *Better Bins Kerbside Collection Guidelines*. There is a funding program associated with these Guidelines so it is likely that Local Governments will begin to work towards the options outlined in the Better Practice Guideline. These Guidelines favour:

- 2 bin system: recycling bin and a general waste bin with the material being treated by an Alternative Waste Treatment facility; or
- 3 bin system: waste, recycling and organics bins.

These Guidelines are available from the Waste Authority Website

[www.wasteauthority.wa.gov.au](http://www.wasteauthority.wa.gov.au)

#### General waste

Where a kerbside collection service is offered, waste is usually collected in 240L MGB's on a weekly basis. Some Local Governments are offer smaller waste bins, in conjunction with larger recycling bins and organics collections.

Some Local Governments direct their 'waste bin' to an Alternative Waste Treatment facility, where the organic components of the bin are composted.

## **Comingled Recyclables**

The most widespread approach to kerbside recycling is a 240L MGB collected fortnightly. However, some Local Governments have put in place larger recycling bins (360L) or weekly bin collection.

## **Organic waste**

Some Local Government areas have in place a three bin system, with a third bin utilised for the collection of organic or compostable materials. Developments within these Local Governments should ensure that adequate space is provided within bin stores to accommodate organics bins. The introduction of organic waste management system will reduce the number of general waste bins required to service the development. Sufficient space must also be provided within each dwelling for the storage of a smaller bin or 'kitchen caddy' in which residents can collect compostable organic waste. Building management should provide (or require the use of) compostable bags for the disposal of organic waste into collection bins.

## **Alternative On-site Organic Waste Management within Multiple Dwelling Developments**

Another option for organic waste management is onsite management. Communal composting areas must be carefully designed as part of the garden and not merely placed in a convenient area. These systems require a certain level of expertise and maintain, and this responsibility should be clearly detailed in the strata/building and waste management plans. Information on composting techniques is widely available and some Local Governments provide brochures, training and sell compost bins.

Alternatively, a fully-automated electric composting unit may be provided. Accumulated organic waste deposited by residents would be screened and transferred to the unit by the responsible individual. These units can reduce the volume of food waste by up to 90% within just 24 hours, converting it into usable compost over a very short period. Composted material can be applied to garden beds and landscaped areas as a soil conditioner as required, or collected by a third party for use off-site. The authors of the waste and strata management plans must determine what materials will be accepted, as some times, such as meat, disposable nappies and pet waste may be potentially problematic.

In some multiple dwellings developments without gardens or grounds, worm farms have been used to dispose of food waste. Although well-managed worm farms do not emit odour, the possibility of odours is enough to discourage some office management from using these systems. There are some types of food waste that worms will not eat, such as citrus peels, and some which should not be added because of potential odour issues, meat and excess dairy. In addition, the castings and liquid produced from worm farms also has to be managed appropriately. Details on the set-up and management of worm farms can be found at [http://www.wasteauthority.wa.gov.au/media/files/documents/worm\\_farm\\_fact\\_2012.pdf](http://www.wasteauthority.wa.gov.au/media/files/documents/worm_farm_fact_2012.pdf)

Bokashi is a method that uses an air-tight container and a mix of microorganisms to ferment food and minimise odour. Most practitioners utilize commercial microorganism starters comprising of a carbon base (e.g. sawdust or bran) impregnated with bacteria as well as a sugar for food (e.g. molasses). The mixture is layered with waste in a sealed container, where it does not decompose but ferments and reduces in volume as the water content of the waste drains through the grate at the bottom of the bucket. After a few weeks, removed and buried beneath the soil as a soil improver or added to a conventional composting system or worm farm. These systems may be provided to residents, but require education and careful management; including emptying and the regular addition of starter cultures. In view of this, the large-scale use of Bokashi bin systems within residential developments may be problematic.

## Household Hazardous Wastes

The safe disposal of leftover chemicals and other potentially hazardous products is a problem for householders, who may either accumulate unwanted materials in cupboards and garages or dispose of them inappropriately (Figure 7). Under Western Australia's HHW Program, household hazardous waste includes chemical waste and other hazardous materials, such as batteries, fluorescent lamps, and gas cylinders.



Figure 7: Fluorescent light tubes incorrectly placed in kerbside waste collection.

The HHW Program was established in 2008 to provide the Western Australia community with safe HHW disposal options. The Program is funded by the Waste Authority and administered by the Western Australian Local Government Association (WALGA). Some Local Governments and Regional Councils have HHW disposal facilities at their landfills or transfer stations. You do not have to be a resident of the Local Government to drop off waste (any householder can use any of the facilities). All materials collected are recycled or disposed of safely.

The HHW most likely to be generated within multiple dwelling developments include:

- Batteries (lead acid and dry cell);
- Compact fluorescent lamps and fluorescent light tubes;
- Aerosols (CFC-based, paints, lacquers, pesticides etc.);
- General household chemicals (e.g. cleaning products);
- Expired fire extinguishers; and
- Engine coolants and glycols.

The managers of multiple dwelling developments should provide information to residents about what household hazardous waste items are not appropriate for disposal in the general waste system, and where these materials can be taken for correct disposal. Given the nature of these materials, no provisions should be made for the collection and temporary storage of these items within the development.

Some guidance which should be provided to residents includes:

- Always handle hazardous waste carefully and avoid direct contact. Wear protective equipment where possible and always wash hands after handling;
- Where possible keep products in original containers;
- Label materials that are not in their original container;
- Do not mix materials, they may react violently;
- Keep flammable products out of direct sunlight and away from sources of heat, sparks, flames or ignition;
- If container is damaged or leaking. Place it within a larger container with a tightly fitting lid, label outer container with contents; and
- Please notify facilities staff of material type.

For more information on HHW disposal visit [www.wastenet.net.au](http://www.wastenet.net.au)

### Bulky Waste

Consideration should be given to how bulky waste items, such as old and broken furniture and electronic items/white goods and materials generated, will be managed within the development. This is important in reducing the likelihood of residents illegally dumping this material on the footpath or verge, within the grounds or in adjacent open spaces; which will mar the appearance of the development (Figure 8).



Figure 8 - Bed bases, mattresses, white goods, a sofa and other domestic bulky waste items illegally dumped in a vacant lot adjacent to a mixed-use development.

Possible options for the collection of bulky waste materials from multiple dwelling developments include the scheduled provision of a communal skip-bin by building management which will be delivered on-site and manned by Local Government or Waste Service staff who will supervise the disposal of items by residents.

Alternatively, loading bays could be used at pre-determined times for the disposal and collection of bulky waste. Individual residents or building managers could also make arrangements to transport excess bulky items to a waste management centre as and when necessary. These approaches would require residents to store waste within their dwelling or storage space between collections. It may

be useful for a bulky waste management strategy to be developed, including details on what service will be employed and who is responsible for engaging and paying for the service, and the provision of a designated area for the temporary storage of bulky waste.

Where space is available, developers should strongly consider allocating space for the temporary storage of a skip bin within the grounds of the development, such as a turfed or gravel-lined area. This would enable building management or individual residents to easily dispose of bulky waste items from renovations and fit-outs and eliminate any potential issues associated with the placement of skips in visitor parking bays or on the verge.

### Appendix 4a – Level 1 Waste Management Plan – Design Phase

The following simple Waste Management Plan has been developed to confirm that the main issues essential for waste management implementation have been considered and provide a brief outline as to how they have been incorporated into the design of the development.

Key issues	Completed	N/A	Outline of consideration in relation to the development
<b>Initial planning</b>			
Have you consulted with Local Government to find out what waste management services are offered, or if there are any specific requirements, policies etc that the development will need to incorporate?			
For mixed-use developments, will residential and commercial waste streams be managed separately?			
<b>Waste Generation</b>			
Have you identified the volume of waste that is likely to be generated in the operations of the development?			
<b>Design considerations</b>			
Noise – does the development design include better practice measures to minimise noise associated with use of the waste management system?			
Odour – does the development design include better practice measures to minimise odour associated with the use of waste management system?			
Vermin – has the development been designed to minimise the entry of vermin			

to the waste storage areas?			
Hygiene – has the development been designed to allow the waste storage areas to be kept in a good condition?			
Health, Safety and the Environment – does the development design include better practice measure to minimise the risk to Health, Safety and the Environment?			
Safety – does the development design include better practice measures to minimise the chance of illegal activities?			
<b>Waste Storage</b>			
Is there sufficient space within the property boundary to store the volume of waste and recycling (and organics) likely to be generated at the development during the period between collections?			
Is future service flexibility incorporated in the design?			
Have storage areas been designed to accommodate easy access, internal manoeuvring of bins and cleaning?			
Are storage areas conveniently located for residents and caretakers?			
Are storage areas out of sight or well screened from public areas?			
Are storage areas located an appropriate distance from waste sources to reduce potential amenity and OH&S impacts?			
Are storage areas designed to fit into the overall look of the development?			
<b>Waste collection</b>			
Does the development design include better practice measures to ensure waste presentation points are easy to access by waste contractors?			
Has the route from the bin storage area to the presentation point been designed to			

minimise occupational health and safety risks to those transferring the bins?			
<b>Education</b>			
Has clear signage been included to provide instructions on how to use the waste management system?			
<b>Ongoing management</b>			
Have hand over notes been completed so that a building manager is aware of what waste management systems have been planned in the development?			

### Appendix 4b – Level 1 Waste Management Plan – Operational Phase

Key issues	Completed	N/A
<b>Ongoing management</b>		
Has responsibility been assigned (to a building manager or caretaker) to:		
- Manage and clean waste storage areas and presentation points?		
- Transport bins to the presentation point?		
- Use and manage bins, compactors, balers and other waste equipment?		
- Arrange for the removal of illegal dumped material?		
- Undertake ongoing education of tenants in the correct use of the waste management system?		
- Manage waste collection contract?		
- Evaluate the operation of the waste collection contract?		

### Appendix 5 – Level 2 Multiple Dwelling Development Waste Management Plan Template

The Template outlined below should form the basis for the preparation of the waste management plans for multiple dwelling developments. The Template is based on the areas detailed in the Guideline, there may be further considerations that multiple dwelling developments need to include.

#### Introduction

- Background- Address, development area, nature and scale of development (including a table outlining the number and type of dwellings), ownership and management details, projected number of occupants/residents.
- Details of initial contact with Local Government in relation to waste management in the development

## **Waste Generation**

- Calculation of projected waste generation rates based on occupancy and uses using provided figures.

## **Waste Management System – Outline**

### *Storage Internal*

- Provide details on space within units/dwellings for the short-term storage of waste, recyclables and organic material (if applicable).
- Provide an outline of measures to assist residents in the transport of waste and recyclables (reusable store and sort sacks, carry baskets etc.)
- Provide details on proposed chutes, compaction facilities and service elevator/goods lift (if applicable).

### *Bin Storage Area*

- Provide details on the size and location of proposed storage areas.
- Provide details on the proposed number and sizes of the required bins.
- Provide justification for the selection of the storage area location.
- Provide details on how better practice approaches to waste management have been included in relation to noise, odour, hygiene and vermin, security and Health, Safety and the Environment.

### *Access*

- Provide details on the access routes between residences, drop-off points, the bin store and collection points.
  - This information is to include scaled waste management diagrams, showing the location, access pathways for residents and access pathways for moving bins from storage areas to presentation points and the bins configuration when moved to presentation point.
- Details should be provided on the internal road and driveway layout and how collection vehicles will service the site.

### *Collection*

- Details of and justification for proposed bin collection frequencies based on bin numbers and waste volumes.
- Details of compliance with Local Government or service providers access requirements.
- If relevant, details should be provided on the internal road and driveway layout and how collection vehicles will service the site.

### **Bulky Waste Management**

- Provide details on the location, size and management of a set-down area for the storage/pick-up of bulky waste items /hard waste.
- Provide details of who will be responsible for the removal of illegally dumped bulky waste.

### **Education**

- Provide details on the signage within the development to advise residents/occupants about use of the waste management system.

### **Potential issues**

- Provide details on potential issues which may arise, including how illegal dumping, theft of and/or damage to infrastructure will be monitored and dealt with within the development and what contingencies will be put in place to ensure the continued function of the waste management system in the event of equipment failure or servicing issues.

### **Implementation Schedule**

- Provide details on how the system will be established, if by the developer, or how the information used to design the system will be passed on to the new owners/tenants.
- Provide details on how new residents will be introduced to and educated about use of the waste management system.

### **Auditing/Monitoring**

- Provide details on how the system can be monitored by the caretaker / Local Government / waste contractor.

### **References**

- Provide a list of references for information presented within the Plan.

### **Appendices**

- Provide any relevant reports or supporting documents; including agreements with Local Government or waste contractors.

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## Appendix 6 - Local Government Multiple Dwelling Development Waste Management Plan Checklist

Section	Element	Adequately addressed in WMP (Yes/no)	Comments/feedback	Required modifications
Introduction	<p>Is a brief background provided, including details of :</p> <ul style="list-style-type: none"> <li>- Address;</li> <li>- Development area;</li> <li>- Nature and scale of the development (including number and type of dwelling);</li> <li>- Ownership and management details; and</li> <li>- Projected occupancy.</li> </ul>			
	Are the details of initial contact with Local Government in relation to waste management in the development included?			
Waste generation	Have the projected waste generation rates based on occupancy and uses been calculated using the provided figures?			
Waste Management System - Storage	Are details provided on the space within units/dwellings for short term storage of waste, recycling and organic materials (if applicable)?			
	Have measure been identified which will be used to assist residents to transport waste and recyclables to drop off points?			

Section	Element	Adequately addressed in WMP (Yes/no)	Comments/feedback	Required modifications
	If applicable, have details on proposed chutes, compaction facilities and service elevators/good lifts been supplied?			
Bin Storage Area	Have details been provided on the size and location of the proposed storage areas?			
	Have details been provided on the proposed number and size of bins and is this in line with the expected waste generation figures?			
	Is there clear justification for the location of the storage facility?			
	Has a good description been included about how better practice waste management has been included in order to minimise noise, odour, vermin and to take into account hygiene, security, health safety and the environment?			
Access	Have clear details been provided of the routes residents can take to drop off their waste and recycling? [including diagram]			
	Have clear details been included of the route for any movement from temporary storage areas to presentation areas? [including diagram]			
	Has an outline and diagram of the bin configuration at the presentation point been provided?			

Section	Element	Adequately addressed in WMP (Yes/no)	Comments/feedback	Required modifications
Collection	Have details been provided on the proposed bin collection frequency and bin type? Are these details in line with the information provided on waste volumes likely to be generated?			
	Do the details provided for collection align with the Local Government / service provider requirements?			
	If relevant, have details been provided on the internal road and driveway lay out and how collection vehicles will service the site?			
Bulky Waste Management	Have details been provided on the areas for bulky waste storage and collection?			
	Have details been provided regarding who will be responsible for removal of illegal dumping?			
Education	Have details been provided on the signage which will be used to inform residents/occupants about use of the waste management system?			
Potential issues	Have details been provided on the range of potential issues which may arise during occupancy and how these issues will be addressed?			
Implementation schedule	Have details on how the system will be established been provided – such as handover information for a Strata Company/New Owner?			

Section	Element	Adequately addressed in WMP (Yes/no)	Comments/feedback	Required modifications
	Has information been provided on how new residents will be introduced to and educated about the system and appropriate behaviours been included?			
Auditing/ monitoring	Are details on how the system will be monitored and who by provided?			
References	Are the relevant references provided?			
Appendices	Are any relevant documents attached?			

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