

## Waste Management Plan

Demolition of existing structures;  
Construction of a Double Storey  
Dwelling.

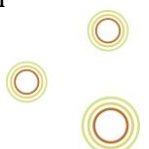
53/-/DP231533  
9 Viola Place, Greystanes  
New South Wales, 2145

**Cumberland City Council**

# Waste Management Plan

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Revision

9/01/2024 – Issued to Designer – For Review

TOP SECRET



## Introduction

This Waste Management Plan has been prepared to accompany an application for the Demolition of existing structures; Construction of a Double Storey Dwelling at the subject site being 9 Viola Place, Greystanes in accordance with best practice guidelines, Councils Development Control Plan and local policies for waste management.



Figure 1: Proposed Development at 9 Viola Place, Greystanes

This Waste Management Plan has been prepared on the assessment of the following plans and documents:

- *Department of Environment and Climate Change NSW, Model Waste Not DCP Chapter 2008, A Site Waste Minimisation and Management Chapter for Consolidated Development Control Plans*
- *State of NSW and Environment Protection Authority, NSW Waste Avoidance and Resource Recovery Strategy 2014–21*
- *WALGA Demolition Waste Management Plan Guidelines*
- *State of NSW and Environment Protection Authority, Construction and demolition waste, A management toolkit*
- *State of NSW and the NSW Environment Protection Authority, Better practice guide for resource recovery in residential developments*
- *Master Builders WA, Master Builders Association Master Builders Waste Reduction Guide 2014*
- *UPDATE to suit for Council's city guidelines on Waste Management or relevant WMP documentation.*
- *Architectural plans prepared by Peak Architects, 340 Rooty Hill Road, North Plumpston, Issue B, dated 31 January 2023.*

Other plans and reports pertaining to this Waste Management Plan are noted where relevant.

TOP SECRET



## Site Waste Minimisation and Management

Effective waste management is a fundamental responsibility for the NSW community as well as the global community. Without it, we risk compromising our environment, our health and our economy.

The NSW Government has set priorities for waste reform in [NSW 2021: A plan to make NSW number one](#) and commits to developing long-term strategies that encourage resource recovery and prevent unnecessary waste.

The impact and importance of waste can be measured across the economy, our environment and society.

### Waste and the economy

Waste management is a significant part of the economy. The Australian Bureau of Statistics estimated that the supply of waste management services nationwide in 2009–10 was worth over \$9.5 billion, including income from recycling waste products valued at \$4.5 billion.<sup>1</sup> As NSW generates 31% of Australia's gross domestic product, the value of waste management services to the NSW economy can be estimated at \$2.9 billion – \$1.3 billion of this coming from resource recovery.

Just over 17 million tonnes of material entered the NSW waste management system in 2010–11, up from 16.3 million tonnes two years earlier. While a large percentage of this material was ultimately recycled, this still represents a significant amount of material moving through the economy as well as physically through our neighbourhoods by road and rail. Waste collection, transport, processing and recovery/disposal have a major impact on existing infrastructure and increase demand for new infrastructure.

The economy depends on the environment to provide raw materials and absorb the waste and emissions we produce. Reusing, recovering and recycling these valuable materials keep them in the productive economy for longer. This has the dual benefits of lowering demand for new resources and reducing the need to absorb waste. Waste going to landfill is not only a loss of valuable resources, it reduces landfill space.

#### Recycling generates jobs

In 2009, Access Economics estimated that more than 22,000 full-time equivalent staff were engaged directly in recycling in Australia. Nearly 7000 staff were involved in landfill operations with over 24,000 indirect jobs flowing from this. This means there are 9.2 full-time equivalent employees directly involved in recycling for every 10,000 tonnes of material processed, compared with only 2.8 jobs for an equivalent amount of waste sent to landfill.

#### Recycling saves money

In 2012, the cost to Australian businesses (excluding mining and agriculture) of managing the waste they generated was an estimated \$2.2 billion.<sup>3</sup> In addition, businesses spent an estimated \$24.3 billion on materials that were discarded as part of the

creation of a product. For NSW businesses, this equates to about \$825 million for disposal and recycling services and \$7.8 billion in wasted materials every year.

This inefficient use of resources highlights waste that could be avoided and money saved.

## Waste and the environment

Managing and disposing of waste presents risks to the environment. Impacts include odour, noise, dust, litter, dumping, greenhouse gas emissions, potential contamination of land and groundwater, and harm to flora and fauna. The risks to the environment rise as more waste is generated and are reduced by increasing recycling.

The NSW EPA's [Recyculator](#) can be used to calculate the resource benefits of recycling different materials, based on a detailed Australian life cycle analysis. For example, a business recycling 1000 tonnes of office paper can save:



670 tonnes of carbon dioxide –  
equal to permanently removing 161 cars from NSW roads



2630 gigajoules of energy –  
equal to the average annual energy used by 122 households



370 megalitres of water –  
equal to a million four-minute showers



4400 cubic metres of landfill space –  
equal to about 18,333 full wheelie bins.

## Waste and society

The community feels the impact of improperly managed waste in many different ways. It can be detrimental to public health through odour, noise, dust, vermin and toxic substances, while wastes of particular concern, like asbestos, can cause significant health problems. The same issues can impact the amenity of local communities to the detriment of public well-being. Waste can also pollute our environment and leach toxins or nutrients into groundwater and land.

Litter and illegal dumping can reduce the amenity of public spaces and are anti-social behaviours. Landfills remove space from the community and may compromise the use of land into the future.

### People in NSW have high expectations about waste and recycling

Waste-related issues have consistently been identified by the NSW community as environmental issues of concern in the [Who Cares About the Environment?](#) survey. The survey – which has been running since 1994 and is the only one of its kind in



Australia – tracks the attitudes, knowledge and behaviour of people in relation to the environment.

In 2012, the NSW community again identified waste among the leading issues they expect the Government to address. Litter was identified as a specific issue.

## **Sustainable resource management**

Sustainable resource management and waste minimisation has emerged as a priority action area and a key in the quest for Ecologically Sustainable Development (ESD). Critical actions in this regard include the following (moving from most desirable to least desirable):

- avoiding unnecessary resource consumption
- recovering resources for reuse
- recovering resources for recycling or reprocessing
- disposing of residual waste (as a last resort).

The building and construction industry in particular is a major contributor to waste, much of which is still deposited to landfill. The implementation of effective waste minimisation strategies has the potential to significantly reduce these volumes.

Effective waste planning and management can also benefit the builder/developer. Some of the benefits of good waste planning and management include:

- reduced costs
- improved workplace safety
- enhanced public image
- compliance with legislation such as the *Protection of the Environment Operation Act 1997* that requires waste to only be transported to a place that can lawfully accept it.

The objectives in pursuit of sustainable waste management include:

### Waste minimisation

- To minimise resource requirements and construction waste through reuse and recycling
- and the efficient selection and use of resources.
- To minimise demolition waste by promoting adaptability in building design and focussing
- upon end of life deconstruction.
- To encourage building designs, construction and demolition techniques in general which
- minimise waste generation.
- To maximise reuse and recycling of household waste and industrial/commercial waste.



## Waste management

- To assist applicants in planning for sustainable waste management, through the preparation
- of a site waste minimisation and management plan.
- To assist applicants to develop systems for waste management that ensure waste is
- transported and disposed of in a lawful manner.
- To provide guidance in regards to space, storage, amenity and management of waste
- management facilities.
- To ensure waste management systems are compatible with collection services.
- To minimise risks associated with waste management at all stages of development.

### Site Waste Minimisation and Management Plan (SWMMP)

A Site Waste Minimisation and Management Plan (SWMMP) outlines measures to minimise and manage waste generated during:

- demolition
- construction
- ongoing use of the site/premises.

In doing so, the SWMMP nominates:

- volume and type of waste and recyclables to be generated
- storage and treatment of waste and recyclables on site
- disposal of residual waste and recyclables
- operational procedures for ongoing waste management once the development is complete.

The SWMMP highlights the method of recycling or disposal and the waste management service provider.

## **Waste Management Principles**

When dealing with waste, the following hierarchy has been adopted, prioritising from left to right:



### Avoid

waste by careful planning at the design, drawing and documentation stages. It is at this stage that the greatest reductions in waste can be achieved:

- Select building materials and systems with low waste rates. In particular, consider modular and prefabricated construction materials that minimise onsite waste.
- Choose a method of construction to minimise cut and fill.
- Design with life-cycle assessment in mind, considering end of life uses.
- Use dimensions that suit standard material sizes. Plan the use of materials better to reduce the volume of waste (especially off-cuts).
- Reduce waste allowance in the planning stage, e.g. decrease concrete waste allowance from 5% to 3%.
- Appropriate storage and management of materials onsite will minimise damage from weather or machinery, or theft, and will eliminate the need for replacement and waste generation.
- Minimise the time between delivery and installation of materials, to reduce the risk of damage and subsequent waste.
- Check quantity, condition and quality of goods on delivery. Reject inferior goods if their quality will result in additional waste. Refuse over-supply as compensation for inferior quality or condition.

### Reduce

by limiting waste when purchasing.

You can:

- Purchase materials with minimal packaging.
- Control purchasing to limit over ordering and to encourage buying of recycled or recyclable materials where appropriate.
- Improve site security to reduce theft of materials thus allowing the reduction in the over ordering margin.

### Reuse

by finding available recycled materials from demolition works, civil works, suppliers or nearby locations, especially sand.

- Identify, source and specify recycled materials, or materials with a recycled content, to be used during construction.
- Materials that can be reused or used on future projects include surplus sand / soil (siteworks), PVC & plumbing fittings (pre-lay), formwork & accessories (slab), waterproof membrane (WPM), reinforcement & accessories, bricks, bags of cement / lime, brickwork hardware, windows, door frames, timber (treated & untreated), timber fixings & accessories, metal roof sheeting, roof tiles, fascia, gutters & downpipes, fibre cement sheeting, doors, plasterboard & accessories, paints, paving bricks and reticulation.

### Recycle

by implementing a waste management plan, incorporating bins and any space on your site drawings.

- Determine whether you will separate your waste materials onsite, use a co-mingled recycling company and place all waste in one bin, or employ a combination of both methods.

## Disposal

Finally, the waste hierarchy recognises that some types of waste, such as hazardous chemicals or asbestos, cannot be safely recycled and direct treatment or **disposal** is the most appropriate management option.

Better practice waste management planning in the design stage can make it easier and more convenient for residents, building managers and collection staff throughout the life of a development.

Stakeholder		Benefits
	<b>Architects/designers</b>	<ul style="list-style-type: none"> <li>• Recognition of good building design, leading to environmental and design awards and achievements</li> <li>• Compliance with council requirements</li> <li>• Faster and more efficient development approval</li> </ul>
	<b>Developers</b>	<ul style="list-style-type: none"> <li>• Improved reputation through increased satisfaction of buyers and building managers</li> <li>• Compliance with council requirements</li> <li>• Faster and more efficient development approvals</li> </ul>
	<b>Council and private certifiers</b>	<ul style="list-style-type: none"> <li>• Speedy and efficient approval of developments</li> <li>• Safe, clean and effective waste and recycling service delivery</li> <li>• Fewer complaints by cleaners, staff, tenants, visitors, owners and residents</li> </ul>
	<b>Agents/building managers</b>	<ul style="list-style-type: none"> <li>• Increased ability to maintain waste areas and equipment</li> <li>• Reduced risk of injury to cleaners, staff, tenants, visitors and residents</li> <li>• Fewer complaints by cleaners, staff, tenants, visitors, owners and residents</li> <li>• Reduced cost of maintenance and ongoing management</li> </ul>
	<b>Residents</b>	<ul style="list-style-type: none"> <li>• Greater satisfaction with service provision</li> <li>• Increased ability and willingness to participate in recycling</li> <li>• Improved amenity and safety</li> <li>• More cost-effective waste management systems</li> </ul>
	<b>Waste collection service providers</b>	<ul style="list-style-type: none"> <li>• Improved safety outcomes</li> <li>• Easier and more efficient collection</li> </ul>
	<b>Wider community</b>	<ul style="list-style-type: none"> <li>• Improved aesthetics, amenity, public health and safety</li> <li>• Reduced costs associated with litter and illegal dumping</li> <li>• Increase recovery of recycling and organics</li> </ul>
	<b>Wider environment</b>	<ul style="list-style-type: none"> <li>• Increased recovery of recyclables</li> <li>• Greater contribution to the state-wide targets for waste reduction and resource recovery</li> <li>• Cleaner streets and reduced litter in the environment</li> </ul>

# The Proposal

## Local Character

The area features a variety of buildings and architectural styles, adding to its visual diversity. The subdivision patterns encompass various residential properties, offering housing options that cater to different preferences. The topography of the area includes varying elevations and views, enhancing the natural characteristics of the surroundings. Native vegetation and well-maintained landscapes further enhance the visual appeal, creating an inviting and aesthetically pleasing urban environment.

## Neighbourhood Scale & Streetscape

The locality is characterised by similar lot sizes and frontages, containing both older and newer single and double storey dwellings, with associated pools, outbuildings and attached and detached garages.

## Site Scale

53/-/DP231533 (9 Viola Place, Greystanes) is a fairly regular shaped allotment with a total area of 948.9m<sup>2</sup> and a 17.435m frontage to Rooty Hill Road. The land is zoned as R2 – Low Density Residential. The proposed site is currently contains a single dwelling house.

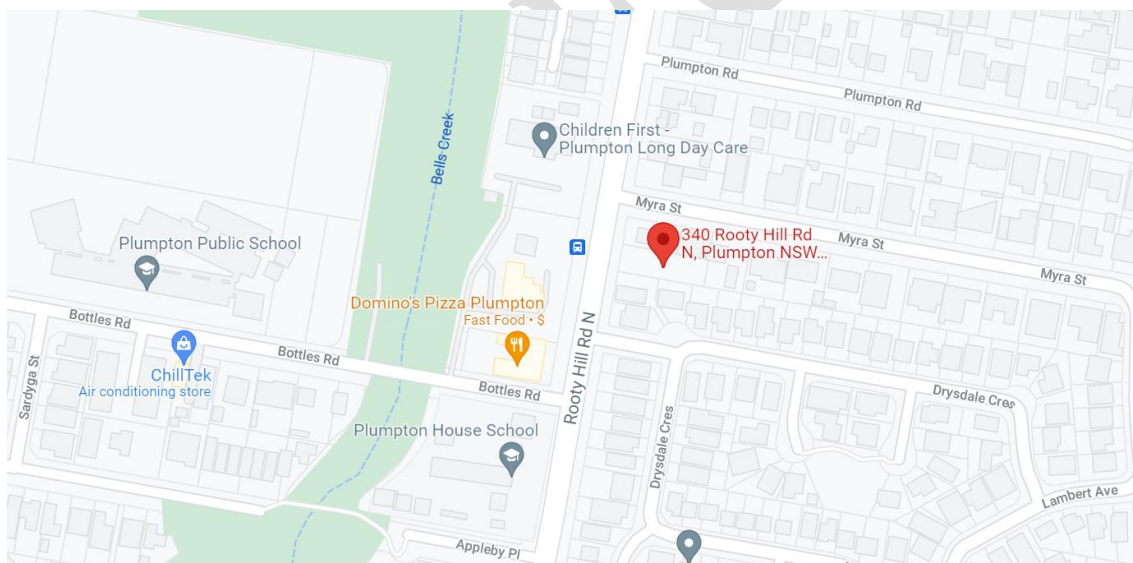


Figure 2: Location of 9 Viola Place, Greystanes (Google Maps)





Figure 3. Neighbourhood scale 9 Viola Place, Greystanes (SIX Maps)



Figure 4. Extract showing the current streetscape of 9 Viola Place, Greystanes (Google Street view)

## The Development

The development proposes Demolition of existing structures; Construction of a Double Storey Dwelling consisting of:

Ground floor:

- Entry Lounge;
- Bedroom and bathroom
- Laundry room;
- Combined Kitchen & WIP, dining and living room
- Rear Alfresco
- Single garage

1st Floor:

- Master Bedroom, WIR & Ensuite
- Bedroom 2, Bedroom 3 & Bedroom 4
- Bathroom
- Study

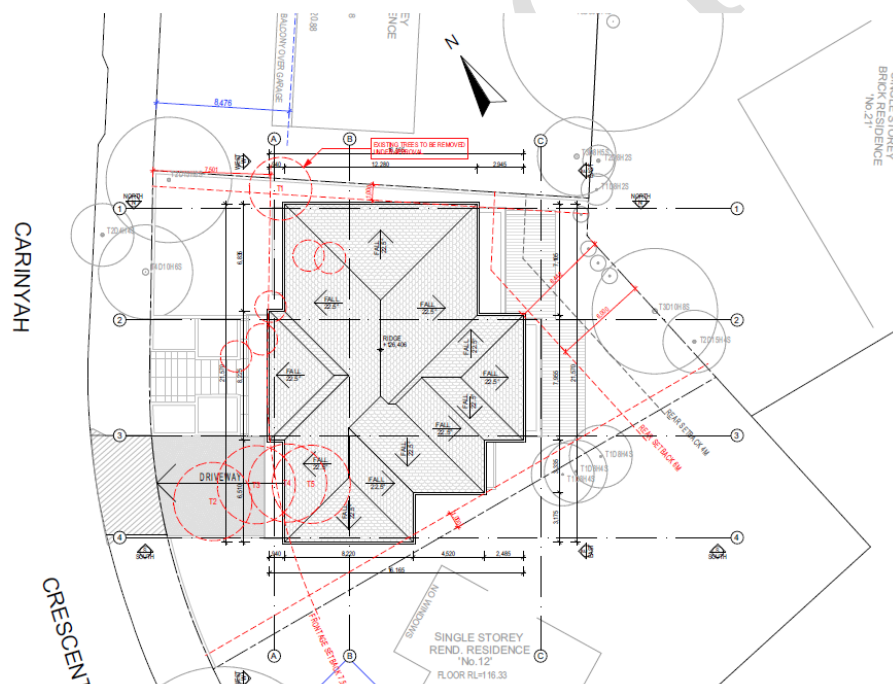


Figure 5. Site Plan of 9 Viola Place, Greystanes (Peak Architects)

## Stage 1 – Demolition

The demolition stage provides great scope for waste minimisation. Proponents are actively encouraged to consider possible adaptive reuse opportunities of existing buildings/structures, reuse of materials or parts thereof.

### Aim:

The principal aim of managing this activity is to maximise resource recovery and minimise residual waste from demolition activities.

### Objectives:

- Optimise adaptive reuse opportunities of existing building/structures.
- Maximise reuse and recycling of materials.
- Minimise waste generation.
- Ensure appropriate storage and collection of waste.
- Minimise the environmental impacts associated with waste management.
- Avoid illegal dumping.
- Promote improved project management.

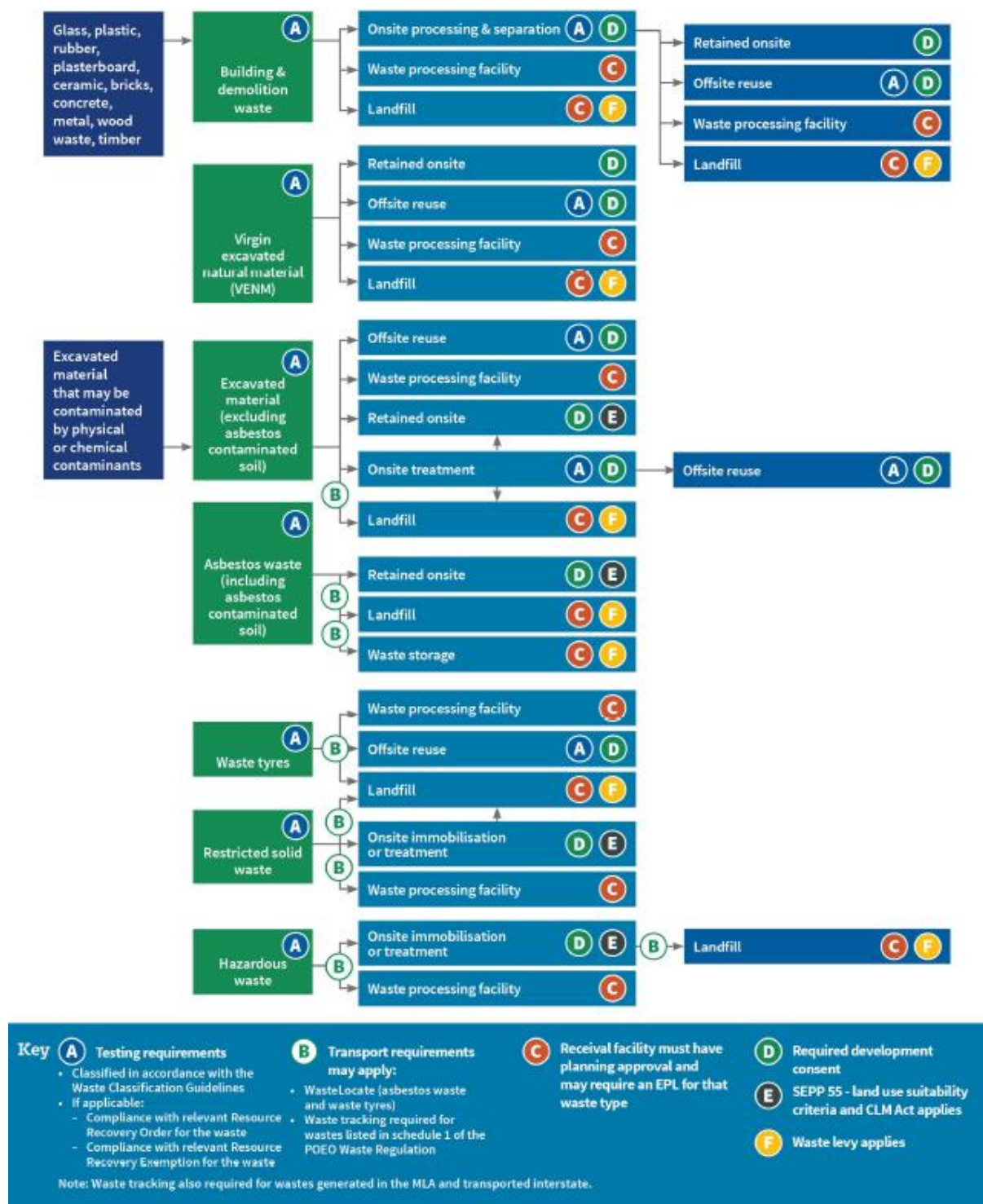
The following activities are suggested at this stage of the project:

1. **Waste streams:** identify which waste streams are likely to be generated and the approximate amounts of material.

Undertake inventory of materials that can be recycled from the demolition-site:

- Specific types of materials
- Amount of material expected
- Condition of materials: cleaner material is easier to recycle and may affect the contractor price for recycling
- Possible contamination by hazardous materials like asbestos or lead: these materials will limit reuse /recycling options and require special disposal.





**Examples of demolition materials and potential reuse/recycling opportunities** (based on the *Combined Sydney Regional Organisation of Councils Model DCP 1997*)



Material	Reuse/recycling potential
Concrete	Reused for filling, levelling or road base
Bricks and Pavers	Can be cleaned for reuse or rendered over or crushed for use in landscaping and driveways
Roof Tiles	Can be cleaned and reused or crushed for use in landscaping and driveways
Untreated Timber	Reused as floorboards, fencing, furniture, mulched or sent to second hand timber suppliers
Treated Timber	Reused as formwork, bridging, blocking and propping, or sent to second hand timber suppliers
Doors, Windows, Fittings	Sent to second hand suppliers
Glass	Reused as glazing or aggregate for concrete production
Metals (fittings, appliances and wiring)	Removal for recycling
Synthetic Rubber (carpet underlay)	Reprocessed for use in safety devices and speed humps
Significant Trees	Relocated either onsite or offsite
Overburden	Power screened and used as topsoil
Garden Waste	Mulched, composted
Carpet	Can be sent to recyclers or reused in landscaping
Plasterboard	Removal for recycling, return to supplier

2. **Services:** select an appropriately qualified waste management contractor to provide services for the waste streams generated and data on waste/recycling generation.

3. **On-site:** understand how the waste management system will work on-site, including bin placement and access.

- Determine storage requirements (separate bins or co-mingled), things to consider include:
  - Ease of use: ensure that containers are easily accessible by workers
  - Safety: ensure that the containers and storage can be managed safely, including limiting public access to the site
  - Aesthetics: ensure that the site appears orderly and will not raise concern from local residents or businesses.
- Establish a collection/delivery plan in collaboration with waste contractors for waste and recyclable materials generated on-site.
- Separation of different materials for collection and/or recycling is one way of preventing contamination and increasing resource recovery rates. Source separation is particularly important in minimising damage to salvaged materials, such as window glass, high-value timber and furnishings.
- Off-site sorting using co-mingled demolition waste bins is another means of recovering demolition waste materials. Off-site sorting is particularly useful on constrained sites as it enables all materials to be placed in the same bin for transport. This material is then collected and delivered to a processing plant where they will be sorted mechanically for recycling, reprocessing or disposal to landfill.

4. **Clearly assign and communicate responsibilities:** ensure that those involved in the construction are aware of their responsibilities in relation to the waste management plan.

5. **Engage and educate personnel:** be clear about how the various elements of the waste management plan will be implemented and ensure staff have an opportunity to provide feedback on what is/isn't working.

Whatever waste management system is in place, it is vital that all personnel using it understand how to use the system and who has responsibility for ensuring it is used correctly. Trying new approaches and systems can be difficult as it expects a change to current behaviour. By providing feedback mechanisms for personnel, you can build on experience.

6. **Monitor:** to ensure the plan is being implement, monitor on-site.

Ensuring the system is working is liked to asking personnel for feedback. Another option is to seek feedback from waste management contractors or undertake site inspections to see if the correct material is going into the bin and to understand what waste is being generated that was not expected.

7. **Evaluate:** once the project is complete evaluate your estimates in the Plan against actual waste generated and consider feedback from personnel.

### Estimating Demolition Waste

Demolition waste yields (from NSW Department of Environment, Climate Change and Water *House Deconstruction Information Booklet*, 2010).

Material	House Type			
	Asbestos fibro (t)	Weatherboard (t)	Brick veneer (t)	Full brick (t)
Asbestos sheeting	1.8	-	-	-
Fittings	1	1	1.5	1.5
Roof Tiles	5	5	12	8
Plasterboard	2	2	2.5	1
Timber	5.3	7.2	9.6	6.9
Concrete, Bricks, Footings	20	50	120	180
<b>Total</b>	<b>35</b>	<b>65</b>	<b>146</b>	<b>197</b>

Demolition waste expected for Demolition of existing structures; Construction of a Double Storey Dwelling at 9 Viola Place, Greystanes:

Materials on site		Destination		
Type of Material	Estimated Volume (m3) area (m2)	Reuse & Recycling		Other
		On-site	Off-Site	Disposal
Excavation Materials	N/A	N/A	N/A	N/A
Green Waste	N/A	N/A	N/A	N/A
Concrete & Bricks	225m <sup>3</sup>	N/A	Brandown Concrete Recycling	N/A
Asbestos &/or Gyprock Lining	10m <sup>3</sup>	N/A	Sita Australia Veolia	N/A
Mixed Materials	6m <sup>3</sup>	N/A	Brandown, Girraween Recycling	N/A
Timber	300LM	N/A	Brandown, Girraween Recycling	N/A
Plasterboard	3m <sup>3</sup>	N/A	Sita Australia	N/A
Metals	200kg	N/A	Sell and Parker	N/A
Roof Tiles	15m <sup>3</sup>	N/A	Concrete Recyclers	N/A

When implementing the SWMMP the applicant must ensure:

- Footpaths, public reserves, street gutters are not used as places to store demolition waste or materials of any kind without Council approval.
- Any material moved offsite is transported in accordance with the requirements of the *Protection of the Environment Operations Act (1997)*.
- Waste is only transported to a place that can lawfully be used as a waste facility.
- Generation, storage, treatment and disposal of hazardous waste and special waste (including asbestos) is conducted in accordance with relevant waste legislation administered by the EPA and relevant Occupational Health and Safety legislation administered by WorkCover NSW.
- Evidence such as weighbridge dockets and invoices for waste disposal or recycling services are retained.

## Stage 2 – Construction

Attention to design, estimating of materials and waste sensitive construction techniques and management practices can achieve significant rewards in managing waste.

### Aim:

The principal aim of managing this activity is to maximise resource recovery and minimise residual waste from demolition activities.

### Objectives:

- Maximise reuse and recycling of materials.
- Minimise waste generation.
- Ensure appropriate collection and storage of waste.
- Minimise the environmental impacts associated with waste management.
- Avoid illegal dumping.
- Promote improved project management.
- Optimise adaptive reuse opportunities of existing building/structures.

### Estimating Construction Waste

'Rule of Thumb' for renovations and small home building (from Waste Planning Guide for Development Application, Inner Sydney Waste Board, 1998).

Materials	Percentage of Waste / Total Materials Ordered
Timber	5 - 7%
Plasterboard	5 - 20%
Concrete	3 - 5%
Bricks	5 - 10%
Tiles	2 - 5%

Converting volumes to tonnage (from NSW Department of Environment, Climate Change and Water House Deconstruction Information Booklet, 2010).

Materials
Timber = 0.5 tonnes per m <sup>3</sup>
Concrete = 2.4 tonnes per m <sup>3</sup>
Bricks = 1.5 tonnes per m <sup>3</sup>
Tiles = 0.75 tonnes per m <sup>3</sup>
Steel = 2.4 tonnes per m <sup>3</sup>



Construction waste expected for Demolition of existing structures; Construction of a Double Storey Dwelling at 9 Viola Place, Greystanes:

Materials on site		Destination		
Type of Material	Estimated Volume (m3) area (m2)	Reuse & Recycling		Other
		On-site	Off-Site	Disposal
Excavation Materials	3.25m <sup>2</sup>	Excavation soil to be reused for benching platform	Re-use on site	N/A
Green Waste	1.5m <sup>2</sup>	N/A	Transferred to Brandowns by Landscaper	N/A
Bricks	1.75m <sup>2</sup>	Unbroken bricks to be kept on site for reuse	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A
Concrete	1.25m <sup>2</sup>	To be spread on driveway to form part of Temp vehicle access	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A
Asbestos Cement Roof & Wall Cladding	N/A	N/A	N/A	N/A
Timber - Pine	2.25m <sup>2</sup>	Reuse framework. Chip suitable for use in landscaping	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A
Plasterboard	6.5m <sup>2</sup>	Break-up and use in landscape	Sorted, piles and picked up by Boral Plasterboard	N/A
Metals – Aluminium	1.25m <sup>2</sup>	N/A	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A
Tiles	0.75m <sup>2</sup>	Crush and use as granular fill in drainage excavations.	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A
Other – Plastic, PVC	2.0m <sup>3</sup>	N/A	Brandown, Lot 9 Elizabeth Drive, Kemps Creek. NSW	N/A

When implementing the SWMMP the applicant must ensure:

- Identify potential reuse/recycling opportunities of excess construction materials.
- Incorporate the use of prefabricated components and recycled materials.
- Arrange for the delivery of materials so that materials are delivered 'as needed' to prevent the degradation of materials through weathering and moisture damage.

- Consider organising to return excess materials to the supplier or manufacturer.
- Allocate an area for the storage of materials for use, recycling and disposal (considering slope, drainage, location of waterways, stormwater outlets and vegetation).
- Arrange contractors for the transport, processing and disposal of waste and recycling.
- Ensure that all contractors are aware of the legal requirements for disposing of waste.
- Promote separate collection bins or areas for the storage of residual waste.
- Clearly 'signpost' the purpose and content of the bins and storage areas.
- Implement measures to prevent damage by the elements, odour and health risks, and windborne litter.
- Minimise site disturbance and limit unnecessary excavation.
- Ensure that all waste is transported to a place that can lawfully be used as a waste facility.
- Retain all records demonstrating lawful disposal of waste and keep them readily accessible for inspection by regulatory authorities such as council, DECC or WorkCover NSW.

#### Bricklaying

- Have bricks dropped around the perimeter to save damage in transporting to place of use and to minimise costs.
- Use appropriate mortar strength - softer mortar saves cement and helps in recycling.
- Set aside brick straps for recycling.
- Use a brick supplier who actively recycles their waste and uses recycled materials in their packaging e.g. stickless packs.
- Use the designated area for mixing and washdown.

#### Carpentry

- Use engineered timber products that make efficient use of materials where possible.
- Use sustainably sourced timber.
- Prepare accurate cutting lists before ordering.
- Give joiners a copy of the cutting list. Ensure that carpenters have a complete cutting list to allow efficient timber use.
- Use joinery profiles that can be easily and invisibly joined to reduce off-cuts.
- Use off-cuts wherever possible.

#### Concreting

- Use concrete with recycled aggregate where possible.
- Utilise reinforcement made from recycled steel.
- Form up accurately and minimise wastage. Up to 10 percent is regularly wasted.
- Return surplus to the supplier for recycling.
- Buy from plants that wash out cement to allow recycling of sand and aggregate.
- Crush/smash remnants into small pieces before final set to allow later use as backfill or recycling.

- Always form up an area of path or low grade slab ready to accept remnants.
- Use the designated area for mixing and washdown.

### Electrical services

- Use sub-boards and plan wiring to reduce wiring distances, quantities, waste and cost.
- Recycle off-cuts. Strip insulation from copper which can be sold.
- Use PVC free insulated cable - it lowers leachate toxicity.
- Consider pulse switching and intelligent controls to reduce cabling and energy use.

### Glazing

- Separate construction glass from other glass such as drink bottles.
- Glass can also be recycled as aggregate, talk to your recyclers.

### Painting

- Never clean brushes or rinse paint containers into a street gutter or drain.
- When you are finished working, squeeze out excess paint back into the paint tin.
- Seal the lid securely and store the paint upside down, which creates an airproof seal around the lid. Keep excess paint for future touch-ups.

### Plastering/plasterboard

- Buy plasterboard from suppliers who recycle.
- Sort off-cuts and store on site for return to recycler.
- Keep off-cuts clean and dry.
- Carry useful sized off-cuts to other work areas.
- Metal screws and fixings should be kept out of separated bins.

## Stage 3 – Ongoing Management

Waste services differ between local councils as they depend on contract arrangements, councils' waste management strategies and policies, the population size and access to service provision.

Section 496 of the *Local Government Act 1993* requires councils to levy an annual domestic waste management charge for the provision of a waste management service on each parcel of rateable land. This charge applies even if councils do not provide a waste service.

Local councils operate waste and recycling collection services in two ways:

- by contracting their waste and recycling services to a private waste collection operator, or
- in-house by using the council's own labour and vehicles.

How councils choose to run their waste, recycling and organics services has an impact on the type of services they offer, the type of bins supplied to residents and the range of vehicles within their fleet. For example, some councils may not have a waste collection vehicle within their fleet to service bulk bins.

### Collection services

Councils offer a range of waste and recycling collection services but not all councils provide all service types. The range of services include:

- **Kerbside collection:** waste, recycling and organics are collected from the kerbside
- **Wheel-in and wheel-out service (also known as 'collect and return'):** council waste collection personnel enter the premises to collect the bins and return them to the property
- **Onsite collection:** collection occurs within a development site's boundary at a nominated area.

### Collection point

The collection point is the point from which waste or recycling is collected and transferred from the storage container to a collection vehicle.

The location of the collection point must be decided in consultation with the local council and needs to be identified early in the design process as it can have building design implications. It can also determine the ability of council to provide the service.

### Bin types

The type of waste management services that can be provided to individual developments will vary according to a council's service and the specifications of the waste collection vehicles.

Commonly used bin types and sizes provided by local councils:





Stream	Common single dwelling bin sizes	Common residential flat building bin sizes	Common bin or lid colour coding
Garbage	80L, 120L, 240L	240L, 660L, 1100L	Red
Commingled recyclables*	120L, 240L	240L, 660L, 1100L	Yellow
Recyclable paper and cardboard	120L, 240L	240L, 660L, 1100L	Blue
Garden organics	240L**	240L	Lime green
Food and garden organics	240L	240L	Lime green
Food only**	Not common	240L	Maroon

\* Plastics, glass bottles and jars, aluminium cans, paper and cardboard mixed together

\*\* Food only services are being trialled by some councils in NSW, but availability of the service is currently not widespread. Check with councils for any future plans to introduce this service.

Colour coding bin lids helps people recognise which materials belong in each bin. Consistent colour coding of bin lids by all councils helps educate residents on how to use the waste and recycling services correctly. The above bin lids are colour-coded for garbage (red), commingled recycling (yellow) and garden organics or combined food and garden organics (green).



### Single Dwellings, Semi-Detached and Dual Occupancy

The design of waste and recyclables storage areas within the home and property affect ease of use, amenity, the movement and handling of waste for the life of the development.

#### Aim

To encourage source separation of waste, reuse, and recycling by ensuring appropriate storage and collection facilities for waste, and quality design of waste facilities.

#### Objectives

- Maximise reuse and recycling of materials.
- Minimise waste generation.
- Ensure appropriate collection and storage of waste.
- Minimise the environmental impacts associated with waste management.
- Avoid illegal dumping

### Estimated domestic waste and recycling generation rates

The average total generation of waste per unit per week is approximately 8.5 kilograms (kg) per dwelling per week. Of this, about 6.4kg is general waste and 2.1kg is recyclables. The EPA has provided volume-to-weight conversion figures of 0.131 tonnes per cubic metre for uncompacted domestic waste and 0.262 tonnes per cubic metre for compacted domestic waste.

The most common waste collection systems in single-unit dwellings (typical free-standing houses) is:

- 120L or 140L red-lid bin for waste collected weekly
- 240L yellow-lid bin for recycling collected fortnightly
- 240L green-lid bin for garden organics collected fortnightly (though councils are increasingly introducing combined weekly food waste and organics collections using these green bins to divert food waste from landfill).

Ongoing waste expected for Demolition of existing structures; Construction of a Double Storey Dwelling at 9 Viola Place, Greystanes:

Type of Waste to be Generated	Expected Volume Per Week	Proposed On-Site Storage and Treatment Facilities	Destination
Other waste	80 Litres	Stored in mobile garbage bins awaiting collection	To landfill by council (weekly)
Household recyclables (bottles, cans, paper)	55 litres	Stored in mobile garbage bins awaiting collection	Council recycling service (weekly)
Organic Waste		Stored in mobile garbage bins awaiting collection	Council recycling service (weekly)

Waste containers are to be stored in a suitable location so as to avoid vandalism, nuisance and adverse visual impacts.

A designated area for composting that should not impact on adjoining properties.

Where possible, the waste/recycling storage area should be located in the rear yard and minimise the distance of travel to the collection point.

The waste storage area is to be easily accessible and have unobstructed access to Council's usual collection point.

There should be sufficient space within the kitchen (or an alternate location) for the interim storage of waste and recyclables.

The placement of bins for collection at the nominated collection point should ensure adequate traffic and pedestrian safety is maintained.

**Note:** It is the responsibility of dwelling occupants to move bins to the identified collection

point no earlier than the evening before collection day and to then return the bins to their storage area no later than the evening of collection day. Bins are to remain in their on-site storage area at all other times.

### Multi-Unit Dwellings (Town Houses, Flats and Villas)

The design of waste and recycling storage areas within the unit and property affects ease of use, amenity, movement and handling of waste for the life of the development. Multiple households within the property increase challenges with regard to waste volumes, ease of access and operation of waste sorting and removal systems.

#### Aim:

To encourage source separation of waste, reuse, and recycling by ensuring appropriate storage and collection facilities for waste, and quality design of waste facilities.

#### Objectives:

- Ensure appropriate waste storage and collection facilities.
- Maximise source separation and recovery of recyclables.
- Ensure waste management systems are as intuitive for occupants as possible and are readily accessible.
- Ensure appropriate resourcing of waste management systems, including servicing.
- Minimise risk to health and safety associated with handling and disposal of waste and recycled material, and ensure optimum hygiene.
- Minimise adverse environmental impacts associated with waste management.
- Discourage illegal dumping by providing on site storage, and removal services.

In residential flat buildings, the weekly capacity allocated for waste and recycling differs across councils and is different from that offered to single-unit dwellings. Some councils base capacity requirements on one bin shared between a number of units – for example, two, three or four units per 240L bin for waste. This provides 60L, 80L or 120L per week capacity per unit for waste and a similar method is used for recycling. Some councils provide a different calculation using larger capacities like 660L and 1100L bins.

Table F1: Waste capacities by type

Bin types	Weekly capacity calculation	Approx equivalent weekly capacity per household
240L	1 per 2 units	120L
660L	1 per 6 units	110L
1100L	1 per 9 units	122L
1 m <sup>3</sup> bin	1 per 8 units	125L
1.5 m <sup>3</sup>	1 per 13 units	115L
3 m <sup>3</sup>	1 per 25 units	120L
4.5 m <sup>3</sup>	1 per 38 units	118L

### Estimated domestic waste and recycling generation rates

The average total generation of waste per unit per week is approximately 8.5 kilograms (kg) per dwelling per week. Of this, about 6.4kg is general waste and

2.1kg is recyclables. The EPA has provided volume-to-weight conversion figures of 0.131 tonnes per cubic metre for uncompacted domestic waste and 0.262 tonnes per cubic metre for compacted domestic waste.

Allowing for variances and increases in waste generation, as a general guide, the allowance for waste and recycling storage RFBs can be calculated using the following figures:

Table F2: Estimated domestic waste and recycling generation rates per week

Apartment size	Waste	Recycling	Organics
1 bedroom or studio	80L	80L	25L*
2 bedroom apartment	100L	100L	25L
3 bedroom apartment or greater	120L	120L	50L

\*this assumes a 7L kitchen caddy for food preparation and food scraps is emptied 3.5 times per week. In addition to foodwaste there may also be organics waste generated from the maintenance of communal gardens and pot plants.

Ongoing waste expected for Demolition of existing structures; Construction of a Double Storey Dwelling at 9 Viola Place, Greystanes:

Type of Waste to be Generated	Expected Volume Per Week	Proposed On-Site Storage and Treatment Facilities	Destination
Other waste	80 Litres	Stored in mobile garbage bins awaiting collection	To landfill by council (weekly)
Household recyclables (bottles, cans, paper)	55 litres	Stored in mobile garbage bins awaiting collection	Council recycling service (weekly)
Organic Waste		Stored in mobile garbage bins awaiting collection	Council recycling service (weekly)

## Design of waste systems

Waste management systems must be convenient and simple to use. Effective systems encourage proper use, reduce illegal dumping, maintain cleanliness and amenity of the building and its surrounds and reduce contamination.

Contamination occurs when the incorrect items are placed in the wrong bin. High levels of contamination in recycling or organic bins are likely to result in materials being rejected at the recycling facility and ending up in landfill.

Methods to encourage resource recovery and minimise contamination include:

- locating recycling and organics bins adjacent to waste bins
- providing adequate storage space within each dwelling for sorting materials ready for disposal into the correct bin
- providing separate bins for each dwelling, marked with the unit number to encourage ownership of bins



- displaying information signs in common areas clearly identifying waste, recycling and organics bins and storage areas
- using standard and consistent signage and colour coding that provides instruction on how to use each bin correctly
- through a body corporate or building manager, initiating contact with the council before the building is occupied to ensure the service is ready and to identify resources to assist with educating residents
- having enough space to allow flexibility in services including space for additional recycling options – for example an organics bin or e-waste collection

There is also a variety of education resources to support improved waste management and resource recovery available through the EPA or the local council. Ongoing education is one of the most important factors in encouraging residents to correctly use waste management systems.

## **Bin storage areas**

It is essential to consider bin storage areas early in the design process so that they can be successfully integrated into the overall design of the development and are convenient for all users.

The general guiding principle for bin storage areas is to ensure that enough space is provided within the property boundary to store the range of bins for the quantity of waste, recycling and organics (and other materials where appropriate) likely to be generated between collections. It is also recommended that residents should not be required to walk **more than a maximum distance of 30m** to access the bin storage area.

## **Food waste and composting**

In NSW, approximately 70% of households have access to garden waste services and an increasing proportion of councils also offer combined food and garden services. Where these are not currently available, onsite composting and worm farms are good ways to help residents recycle some of their food scraps. They also provide residents an opportunity to connect in outdoor open spaces within their property.

Communal composting and worm farms can work effectively where:

- a caretaker or gardener is able to manage them
- there are landscaped areas or communal gardens for them
- they can be easily incorporated into the design of communal open space areas
- impacts from odour, vermin and insects are not likely to affect residents.

Communal food waste systems should be visible and easily accessible by residents to assist in keeping the area well maintained.

## Minimising amenity impacts through design

### Noise

Local councils and the EPA often receive complaints from residents about noise from waste and recycling collections. Noise issues are becoming more common with the increase in higher density living and more mixed-use developments. The servicing needs of businesses in mixed-use developments are different from residential dwellings; for example business waste collections may need to be carried out late in the evening.

Noise cannot be eliminated, but it can be better managed through intelligent building design, the use of quieter equipment on waste collection vehicles and the location of collection points. The main sources of noise associated with domestic waste collections are the emptying of glass from bins into the collection vehicle and reversing alarms.

Councils can assist by replacing high-pitched tonal reversing alarms with alternatives such as broadband alarms, reversing cameras and proximity alarms on their own vehicles and specifying contractor vehicles do the same.

Waste chutes and bin rooms can sometimes be a source of noise from waste falling out the bottom of waste chutes in RFBs, the operation of compacting machines and waste collection vehicles servicing bins from bin storage areas.

### Odour

Odours can be minimised by having well-ventilated waste storage areas. Air should be allowed to flow through enclosed waste storage and service areas, bin storage and service rooms and waste chute inlets on each floor of a building. Ventilation openings should be protected against flies and vermin and located as near to the ceiling or floor as possible, but away from habitable areas. Forced ventilation or air-conditioning systems for enclosed storage areas should not be connected to the ventilation system that supplies air to habitable areas.

A key resource for ventilation systems is **AS1668.4-2012 *The use of ventilation and air conditioning in buildings***.

Combined food organic and garden organic bins may need to be located out of the sun and washed regularly to minimise odour.

### Visual amenity

Poorly designed or located bin storage areas can detract from the overall aesthetics of a building and encourage misuse of the bins.

All waste management facilities, including storage areas, should be screened, so they blend in with the development and are not readily visible from any public place. The bin storage room or area also needs to be clearly labelled to identify it as the waste and recycling room.



Key resource for streetscape and amenity considerations: **Section 4W-1 of the *Apartment Design Guide 2015* (DPE)**

The secure waste and recycling room in the above photo is located directly behind the front street entrance to the property so that bins can be moved to and from the kerb easily. The screening is aesthetically in keeping with the rest of the development.

## **Ongoing management and maintenance**

All waste and recycling storage areas and equipment need to be properly maintained and managed for the life of the building. This is important to help:

- maintain amenity
- maximise safety for residents, caretakers and collectors
- maintain hygiene and prevent spills and litter
- maximise resource recovery
- enable efficient servicing of waste for the development.

Poorly maintained waste, recycling and organics bin rooms and storage areas or equipment will encourage misuse of the waste management services and can impact on amenity, work health and safety (WHS) and the ability for residents to recycle correctly.

### Educating the community and residents

The transient nature of people living in residential flat buildings (RFBs), and differences between buildings and services offered by councils, makes ongoing education critical to proper use of waste systems.

Waste education and communication is a specialised area and care must be taken to ensure waste and recycling messages and the mediums of communication are consistent with the policies of local council and NSW Government.

Council waste education officers can assist in providing advice and resources to establish and improve education and communication programs, such as:

- standard signage and stickers for buildings and bins
- correctly colour-coded bin lids
- materials in various languages to assist culturally and linguistically diverse residents to use the waste system.

### Role of building managers and cleaners

Building managers, facilities managers, strata managers, executive committees and cleaning staff can all play a key role in the success of waste management systems.

The strata manager or body corporate can designate the building manager or cleaning staff to support better use of waste and recycling services and systems. They can also ensure accurate waste information is provided to residents. To ensure this happens it is important that:

- the strata manager or body corporate provides the designated building manager or cleaning staff contact details to council's waste management department when the building is first occupied and maintains these contact details
- the building manager or cleaning staff provides information to new residents on how to use the waste management systems, such as the council's clean-up service procedure and which materials go in which bin or should be taken to alternate waste management facilities e.g. paint and batteries (some councils may have information packs that building managers can hand out as needed)
- the strata manager or body corporate remain informed of the council's waste management services and systems so that the building manager or cleaning staff can update residents as needed.

The strata manager or body corporate can identify a **building champion** to take responsibility for maintaining the waste and recycling system. Building champions could be paid cleaners, facilities managers or even residents. Their support, time and effort in keeping waste and recycling rooms clean and informing residents about how to use the waste, recycling and organics services can be critical.

Council's waste management personnel should be advised of the building champion's contact details so that council can support them.

#### When should ongoing management be considered?

It is important to identify whose responsibility it will be to undertake maintenance and cleaning of waste management facilities in the early planning stages of new developments.

Conditions of consent may require that development complies with the submitted and approved waste management plan. As a result, if a caretaker is specified in the waste management plan, it will be the property owner's responsibility to employ a caretaker before residents start to move in.

#### Who will be responsible?

In some cases, this will be the residents, while in others a maintenance and cleaning contractor will be appointed by the Owners' Corporation. The size of the development will also influence who is responsible for ongoing maintenance of the waste management systems and bins. Permanent caretakers or cleaners are recommended for larger developments such as medium-rise and high-rise RFBs and larger mixed-use developments.

#### What tasks are involved in ongoing management and maintenance?

It is important to establish and delegate responsibility for the tasks required for ongoing monitoring and maintenance of waste management services and equipment. Addressing incorrect waste behaviours and/or infrastructure issues quickly will help prevent or minimise issues.

The kinds of tasks that may be undertaken by caretakers or cleaners are:





- regular monitoring of waste and resource recovery rooms
- moving bins to and from the collection point, if required, on collection day
- washing bins and maintaining storage areas
- arranging for the prompt removal of dumped rubbish
- maintaining broken or damaged bins, arranging for repairs to waste equipment and removing blockages in chute systems
- displaying and maintaining consistent signs on all bins and in all communal storage areas
- managing communal composting areas, if applicable
- informing residents such as through education materials and demonstrations
- promptly addressing overflowing bins to avoid raids by birds and other animals which can result in waste spilling onto the ground and becoming litter
- maintaining hygiene by promptly addressing infestations of flies, cockroaches and other vermin in bin storage areas.

## Work, health and safety

The design of waste systems can have an impact on the work, health and safety of the people who interact with them.

Those at risk include:

- residents using the service
- building management and cleaning staff that maintain the service
- pedestrians and road users
- collection staff providing the service
- waste facility staff
- other people engaged in or affected by the collection service.

Yours Faithfully,



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## Plan for Tomorrow™

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