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C5 Waste Management

A. Background

Waste management has developed into a major environmental issue linked to sustainability, and is increasing in priority for all levels of government within Australia. There is an increasing realisation that 'waste' is a significant resource, like land and water, due to the potential to reuse, recycle and recover products from waste streams.

Waste management is relevant to all stages of a development from construction, through its ongoing use, to demolition. Waste management also includes the way in which waste is stored and collected.

The Waste Hierarchy

The *Waste Avoidance and Resource Recovery Act 2001* highlights the need for a holistic approach to waste management. The 'waste hierarchy' (see Figures C5.1 and C5.2) attempts to prioritise waste management based on reducing waste generation, re-using existing products, recycling products, recovering products and finally disposing responsibly of waste with the aim of reducing the need for landfill sites.

Figure C5.1

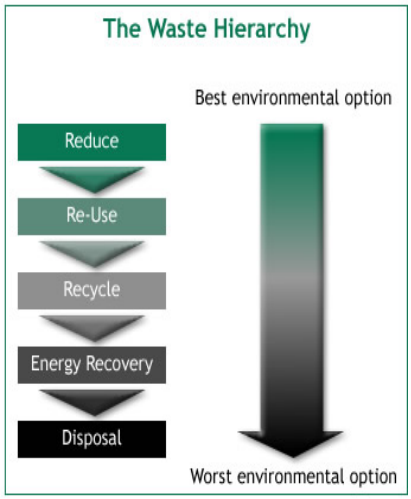


Figure C5.2

Types of Waste

Waste comes in a number of forms including solid, liquid and hazardous wastes. Liquid and hazardous wastes are primarily dealt with by existing Acts and Regulations, but there are some issues relating to rural, health and industrial land uses that are covered by this Plan. Traditionally, solid wastes focussed on municipal wastes such as garbage. Since 2001, waste has been recognised as a by-product of development, with the building and construction industry identified as a major generator of waste.

Benefits of Waste Management

Effective waste planning and on-site management assists in improving the efficiency and lowering the cost of the development/construction process. A few of the benefits of good waste planning include:

- **Costs**: Material wasted on site is paid for twice – once in the original purchase, and secondly, in its disposal. Reducing waste reduces these costs.
- **Safety**: Good site management can improve site safety and reduce liabilities – 'A Clean Site is a Safe Site'.

- **Image**: Waste is a significant marketing issue. Good waste management practices can provide a positive image for the builder/developer.

B. General Objectives

a) To facilitate sustainable waste management within the City of Penrith in accordance with the principles of Ecologically Sustainable Development;

b) To manage waste in accordance with the 'Waste Hierarchy' to:

   i) Avoid producing waste in the first place;

   ii) Minimise the amount of waste produced;

   iii) Re-use items as many times as possible to minimise waste;

   iv) Recycle once re-use options have been exhausted; and

   v) Dispose of what is left, as a last resort, in a responsible way to appropriate waste disposal facilities;

c) To assist in achieving Federal and State Government waste minimisation targets as set out in the *Waste Avoidance and Resource Recovery Act 2001* and *NSW Waste Avoidance and Resource Recovery Strategy 2007*;

d) To minimise the overall environmental impacts of waste by:

   i) Encouraging development that facilitates ongoing waste avoidance and complements waste services offered by both Council and/or private contractors;

   ii) Requiring on-site source separation and other design and siting standards which assist waste collection and management services offered by Council and/or the private sector;

   iii) Encouraging building designs and construction techniques that minimise waste generation;

   iv) Maximising opportunities to reuse and recycle building and construction materials as well as other wastes in the ongoing use of a premise; and

   v) Reducing the demand for waste disposal.

C. When does this Section apply?

The provisions of this Section apply to proposals requiring development consent or a Complying Development Certificate, and will include demolition, construction (including earthworks), alteration/addition and/or change of use of buildings for all types of developments in the City of Penrith. This section should also be used as a guide for activities which are classified as exempt development or development which falls under Part 5 ‘Environmental Assessment’ of the *Environmental Planning and Assessment Act 1979*.

D. How to Use this Section

This Plan is a multi-layered document that recognises the relationship of a number of issues to achieving sustainable outcomes. Therefore, when addressing waste management, it is important to read all relevant parts of this Plan.

E. Other Information

People seeking further information on waste management or preparing development applications may wish to refer to the following:

- *NSW Waste Avoidance and Resource Recovery Strategy 2007* and *Performance Report 2008* - Department of Environment and Climate Change
- *Better Practice Guide for Waste Management in Multi-unit Dwellings* (2008) – Department of Environment and Climate Change
- Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities (2012) – Department of Environment and Climate Change
- Waste Classification Guidelines (2008) - Department of Environment, Climate Change and Water.
- Waste Management Guideline Document: Residential Flat Buildings
- Waste Management Guideline Document: Town Houses
- Waste Management Guideline Document: Sub-division

F. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to waste avoidance and management expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls.

Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Reduce the volume of demolition and construction waste going to landfill by 76%;

b) Demonstrate ongoing commitment to waste avoidance and reduce the volume of waste generated by occupants of the development by:

   i) Setting a target for commercial uses,

   ii) Setting a target for industrial uses,

   iii) Setting a target for residential/domestic uses,

   iv) Setting a target for Council's buildings/facilities,

   consistent with targets established in the NSW Waste Avoidance and Resource Recovery Strategy 2007; and

c) Monitor waste generated, recovered and/or sent to landfill by installing a Building Management System.

5.1. Waste Management Plans

A. Controls

1) Applicants are to submit a Waste Management Plan when lodging a development application for:
   a) Demolition or construction of buildings;
   b) Change of use of buildings for rural, residential, commercial and industrial developments;

c) Subdivision of land and/or buildings; or

d) Alterations to 50% or more of the existing gross floor area of buildings, or additions to buildings resulting in a 50% increase (or more) to the existing gross floor area.

2) The Waste Management Plan must be supported by scaled waste management drawings that are to assist in demonstrating compliance with the provisions of this Plan.

3) A Waste Management Plan will also be required for applications for a Complying Development Certificate.

4) The Waste Management Plan enables Council (or the Certifying Authority) to assess the waste likely to be generated by the development and ensure that appropriate actions are taken so as to properly manage the generation, storage and disposal of wastes.

5) The Waste Management Plan must include details of:

a) The types and volumes of wastes and recyclables likely to be generated as a result of the development;

b) How waste and recyclables will be stored and treated on site;

c) How the residual non-reusable or non-recyclable wastes and recyclables are to be disposed of; and

d) How ongoing waste management will operate once the development is complete (for the life of the development).

5.2. Development Specific Controls

A. Background

Different types of development have different requirements for waste management. The following controls for specific types of development are additional to the general controls in this Chapter.

B. Objectives

a) To minimise waste generation for a number of specific development types by providing specific controls for these types;

b) To maximise re-use and recycling of materials through appropriate provision and design of waste recycling areas for each development type;

c) To ensure the appropriate storage and collection of waste from each development type; and

d) To ensure new developments can be serviced efficiently and effectively by Council's standard waste service.

5.2.1. Siting and Design of Waste Bin Storage Areas for Residential Development

1) This section provides design requirements for waste bin collection/storage areas for residential development referred to in this Chapter.

2) **Waste Bin Storage Area Size:**

a) The development must provide a waste bin storage area that is of sufficient size to accommodate all required waste bins associated with the development. This is to be

achieved through the provision of a communal waste storage area. For larger developments, multiple waste bin storage areas may be required.

b) All waste streams must be catered for, including general waste, bulky waste and recyclable waste.

c) Sufficient space must be provided onsite to ensure that adequate room is provided to manoeuvre, clean and maintain all waste and recycling bins for the development.

d) Sufficient space must be provided onsite for any required equipment to manage waste, waste bins (including washing and cleaning) and the waste bin storage area.

3) **Waste Bin Storage Area Location:**

- The waste bin storage area is to be located within the basement footprint of the residential flat building developments.
- The waste bin storage area is to be located on the ground level for multi-unit housing developments.
- The waste bin storage area is to be located where its use and operation will not adversely impact the amenity of development occupants in terms of noise and odour.
- If the waste bin storage area is to be used as the collection point (for multi-unit housing), it must be located and designed to meet the applicable requirements for servicing.

4) **Waste Bin Area Layout**

- The layout of the waste bin storage area is to be designed so that the area is free from obstructions so not to restrict the movement and servicing of the bins.
- An aisle space of 1.2m is required to access and manoeuvre the bins.
- In determining the layout and size of the waste bin storage area, consideration should be given to whether waste bins are required to be rotated. If waste bins are to be rotated, additional room size to aisle width will be required to manoeuvre bins.

5) **Waste Bin Storage Area Construction**

a) Waste Bin Storage Rooms are to be designed so that they can be constructed to the following:

i) Floors must be constructed of concrete at least 75mm thick and graded and drained to a Sydney Water approved drainage fitting.

ii) The floors must be finished to a smooth even surface.

iii) The walls must be constructed of solid impervious material.

iv) The ceilings must be finished with a smooth faced non-absorbent material capable of being cleaned.

v) Walls, ceilings and floors must be finished in a light colour.

vi) It is to be provided with an adequate supply of hot and cold water mixed through a centralised mixing valve with hose cock.

vii) A close fitting and self-closing door openable from within the room.

viii) Must be constructed to prevent the entry of vermin.

ix) Be provided with adequate light and ventilation. The light source must be through controlled light switches located both outside and inside the room.

5.2.2. Residential Development Controls

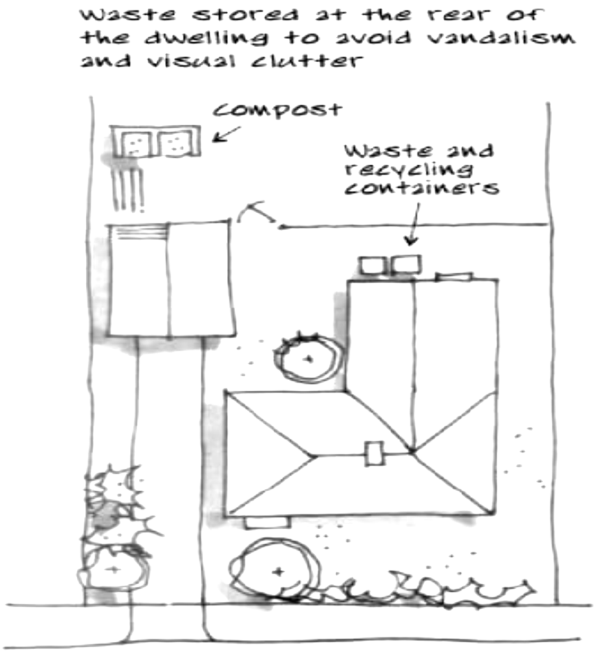
5.2.2.1 Controls applicable to all types of residential development (including dwellings and dual occupancies)

1) The kitchen of each dwelling should be designed with sufficient space (or an alternate location) for the interim storage of organic waste, other recyclable waste and non-recyclable waste. It should be of sufficient size to hold at least a single day's waste and to enable source separation of garbage, recyclables and compostable materials.
2) The design and location of waste storage areas/facilities should be such that they:
   a) Complement the design of both the development and the surrounding streetscape;
   b) Have access to a cold water supply for the cleaning of bins and the waste storage areas; and
   c) Not be visually prominent from public areas.
3) An area for composting is to be provided on site and made available for residents' use. The siting of composting facilities should consider:
   a) The location and proximity of dwellings (including those adjoining the subject property), to minimise likely odour impacts/nuisance;
   b) The location of the drainage system;
   c) Whether the facility is appropriately designed for composting; and
   d) Provision of signposting to ensure inappropriate waste is not added to the compost.

5.2.2.2 Dwelling houses and dual occupancies

1) Waste containers are to be stored in a suitable and easily accessible location on site:
   a) with unobstructed access to Council's usual collection point; and
   b) to avoid vandalism, nuisance and visual clutter.

Figure C5.3: Example of location for waste storage area



5.2.2.3 Multi dwelling housing

1) The term 'multi dwelling housing' is defined in Penrith LEP 2010.

2) For developments comprising up to three dwellings, please refer to the controls applying to "Dwelling houses and dual occupancies" unless the characteristics of the site will restrict or impede access to the collection site. A communal waste storage area must be provided for residential developments in the following circumstances:

   a) Contain four or more dwellings;

   b) Include non-residential uses located in the same building (known as 'mixed use developments' and defined in Penrith LEP 2010);

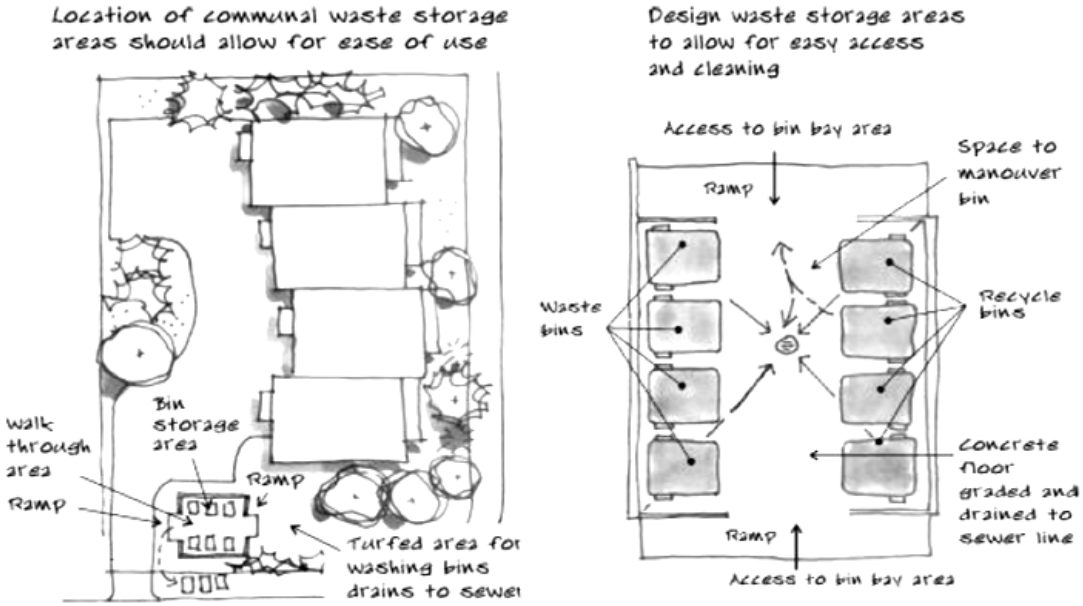
   c) Where the number of bins would not fit comfortably on the street frontage or where the placement of bins along the nature strip would have a detrimental effect on residential amenity; or

   d) Where the characteristics of the site restrict or impede access to the collection site.

3) The development must provide a waste bin storage/collection area that is of sufficient size to accommodate all required waste bins associated with the development. This is to be achieved through the provision of a waste storage bin area either at ground level or within the basement footprint of the development which:

   a) Provides direct and convenient access for the occupants of the development;
   b) Allows for the safe and direct transfer of all waste bins from the waste bin storage area to the collection point;
   c) Does not impact the amenity of occupants within and adjoining the development in relation to visual amenity, noise and odour; and
   d) Does not interfere with the car parking (on or off-street), driveways, footpaths, landscaping and any existing trees and vegetation.
   e) The waste bin storage area is to be designed in accordance with Section 5.2.1 Siting and Design of Waste Bin Storage Areas for Residential Development.
   f) Swept paths demonstrating adequate manoeuvring area are to be provided with the application.

Figure C5.4: Communal waste storage area location layout



4) Where the waste storage area will be secured, the locking mechanism installed must be an Abloy system employed by Council. The installation of the locking system and the supply of keys will be provided by Council at the developer's cost.

5) The size and number of the waste bins shall be determined by Council, having regard to the need for either on-site access by collection vehicles or the requirement for bins to be wheeled to the collection point for collection by a contractor. If transferred to the street for collection, the body corporate or a caretaker must be responsible for the movement of bins to their collection point and their subsequent return.

6) Where on-site collection is required to service the development, adequate and safe access must be provided for Council's Standard Waste Collection Vehicles and waste collection staff as follows:

   a) The site must be designed to allow collection vehicles to enter and exit the site in a forward direction with limited manoeuvring and reversing on-site;

   b) The route of travel (including vehicle manoeuvring areas) for the waste collection vehicle to the collection point is to satisfy the typical dimensions of heavy rigid vehicle. This also includes adequate vehicle clearance for the vehicle. Australian Standard AS2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities provides typical dimensions, turning circles and clearance heights.

   c) The route of travel for the waste vehicle is to be adequately paved and of sufficient strength to support the waste collection vehicle.

   d) The grades of entry and exit ramps must not exceed the capabilities of the waste collection vehicle and are to comply with AS2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities.

   e) The waste collection point and parking area for the waste vehicle is to be clearly nominated with dimensions on the site plan. The collection point is to be of sufficient space to accommodate and safely manoeuvre all required waste bins.

   f) Access to the nominated waste collection point for the development is to be designed to ensure that Council's standard waste vehicle can safely access and manoeuvre within the site. Typical dimensions (and turning circles) for a heavy rigid vehicle are provided within AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities.

7) Where on-site collection is not possible because of topographic or access constraints, and/or restrictive site dimensions, adequate arrangements need to be made for the convenient, safe and direct access between the waste storage room and the collection point. These arrangements need to be discussed at a pre-lodgement meeting with Council.

8) For developments where on-site collection is required or where Council collectors are required to enter a site for the purpose of waste collection services, an agreement will be required to be entered into with Council. This agreement is to be entered into with Council giving power and authority to Council to enter the; and for the purpose of waste services. Council is also to be provided with indemnity against any future claims for damage and loss.

5.2.2.4 Residential Flat Buildings

1) The development must provide a waste bin storage area that is of sufficient size to accommodate all required waste bins associated with the development. This is to be achieved through the provision of a waste storage bin area located within the basement footprint of the development. For larger developments, multiple waste bins storage areas may be required.
    a) The waste bin area is to be designed in accordance with Section 5.2.1 Siting and Design of Waste Bin Storage Areas for Residential Development.
    b) Additional storage space for bulky items is to be provided for the development.
    c) Swept paths demonstrating adequate manoeuvring area are to be provided with the application.
2) For developments comprising three or more storeys, the development is to incorporate a waste chute system that:
    a) The waste chute system will provide a separate chute for both residual and recyclable material.
    b) Waste Disposal points are to be provided on each residential level of the development located within a high trafficked area for residential use.
    c) Larger recyclable goods are to be placed in a separate location identified by the strata management for collection.
    d) The chute is to be designed to minimise noise and fire risk is reduced.
    e) The chute is to be completely enclosed and fire-rated and comply with the BCA.
    f) The chute is to terminate in a garbage and recycling room and discharge directly into a receptacle.
    g) The waste chute service room must be located directly under where the chute terminates. The room will need to accommodate the entire fleet of bins allocated to the development.
    h) A separate bin storage room located in the basement will need to accommodate the entire fleet of bins allocated to the development.
    i) A site caretaker/manager will be required to transfer all bins from the bin storage room to the collection room located on ground floor.
3) Council may consider an alternative solution to the waste chute system for developments comprising three or more storeys if the applicant can demonstrate:
    a) That the alternative system provides a convenient method for the transfer of waste to a centralised location within the basement/ground floor;
    b) Provides adequate room to cater for the storage and easy access to all waste bins required for the size of the proposed development; and
    c) Does not require residents to walk to the ground floor with waste and dispose of the waste within designated bins.
4) The Waste Services Room is to be provided so that:
    a) It is accessible for residents on each residential level of the development. The waste services room will include the access to the residual and recyclable chute with provisions for cardboard storage.

b) The maximum travel distance from any dwelling to the waste services room is not to exceed 75m.

c) The waste service room must be of adequate size to accommodate the required access to chutes or waste infrastructure assigned to the development

d) The room is to be designed to accommodate waste generation rates projected for the development

5) On-site collection is required to service the development. Adequate and safe access must be provided for Council's Standard Waste Collection Vehicles and waste collection staff as follows:

a) The route must be designed to allow collection vehicles to enter and exit the site in a forward direction with limited manoeuvring and reversing on-site;

b) The route of travel (including vehicle manoeuvring areas) for the waste collection point is to satisfy the typical dimensions of heavy rigid vehicle. This also includes adequate vehicle clearance for the vehicle. Australian Standard AS2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities provides typical dimensions and turning circles.

c) The route of travel for the waste vehicle is to be adequately paved and of sufficient strength to support the waste collection vehicle.

d) The grades of entry and exit ramps must not exceed the capabilities of the waste collection vehicle and are to comply with AS2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities.

e) The waste collection point and parking area for the waste vehicle is to be clearly nominated with dimensions on the site plan. The collection point is to be of sufficient space to accommodate and safely manoeuvre all required waste bins.

f) Access to the nominated waste collection point for the development is to be designed to ensure that Council's standard waste vehicle can safely access and manoeuvre within the site. Typical dimensions (and turning circles) for a heavy rigid vehicle are provided within AS 2890.2 Parking Facilities: Off-Street Commercial Vehicle Facilities.

6) The on-site collection point is to be clearly nominated on the site plan which accompanies the development application. The collection point is to only temporarily store waste bins so that they can be serviced. The waste bin holding area is to be located fully within the development site. Consideration will be given to multiple waste bin holding areas for larger developments. The collection point is to be designed so that:

a) It is of sufficient size to accommodate all required waste bins for the development;

b) It is located at ground level away from pedestrian entrances of the development and habitable windows (including both the development and adjoining dwellings);

c) It is to be clearly separated from car parking bays (on or off street), footpaths and landscaped areas.

d) The bin-carting route is to ensure that bin transfer complies with the requirements of Work Health and Safety legislation.

e) The bin-carting route:

- is to be direct and as short as possible;
- is to be solid, concrete and non-slip;
- is to be paved and be a minimum of 2m wide;
- is to be free from obstructions and is not required to be carried over any steps;

- is to be a maximum of 75m in length and a maximum grade of 7%; and
- For larger bins (660L &1100L), the maximum length of the route of travel is 10m.

7) Where on-site collection is not possible because of topographic or access constraints, and/or restrictive site dimensions, adequate arrangements need to be made for the convenient, safe and direct access between the waste storage room and the collection point. These arrangements need to be discussed at a pre-lodgement meeting with Council.

8) For developments where on-site collection is required or where Council collectors are required to enter a site for the purpose of waste collection services, an agreement will be required to be entered into with Council. This agreement is to be entered into with Council giving power and authority to Council to enter the site; and for the purpose of waste services. Council is also to be provided with indemnity against any future claims for damage and loss.

9) A separate area should also be provided for the storage and collection of bulky waste (such as old cardboard boxes) and old or discarded furniture/appliances. The sizing of the bulky waste area needs to be capable of holding the bulky waste generated from the development between scheduled pickups. The bulky waste area needs to be located near to the on-site loading bay).

10) Council will consider alternate and innovative waste management systems for high density developments which deliver sound town planning and environmental outcomes for the development and broader community. The applicant is encouraged to discuss the innovate solutions with Council's Waste Management Team and during Council's Pre-DA service.

5.2.3. Mixed Use Development Controls

1) Where mixed use developments include a residential component, separate waste management facilities are to be provided, in accordance with the residential controls identified in Section 5.2 above.

2) For non-residential uses located in mixed use developments, separate waste management facilities are to be provided for the non-residential uses, in accordance with the controls identified in Section 5.2.4 below.

5.2.4. Non-Residential Development Controls

1) These controls will apply to commercial, industrial and any other non-residential development.

2) For any building comprising three or more storeys and not containing dwellings, a suitable system for the interim storage and transportation of waste and recyclables from each storey to the waste storage/collection area is to be integrated within the building's design.

3) Waste storage and collection areas should be:

   a) Flexible in their design so as to allow for future changes in the operation, tenancies and uses;

   b) Located away from primary street frontages, where applicable;

   c) Suitably screened from public areas so as to reduce the impacts of noise, odour and visual amenity; and

d) Designed and located to consider possible traffic hazards (pedestrian/vehicular) likely to be caused by the storage and collection of waste.

4) The following features will need to be considered in the design of waste storage and collection areas:

   a) Dry recyclables including containers, paper, cardboard and toners for printers and photocopiers should be separated from other waste, for recycling;

   b) Food scraps should be placed in specialised containment bins and collected on a regular basis (particularly where large volumes of perishable wastes are generated);

   c) Refrigerated garbage rooms should be provided where there are large quantities of perishable wastes and infrequent collections; and

   d) Clinical or hazardous and liquid waste should be placed in specialised containment bins and collected by specialised services.

5) Grease traps must be provided where there is a likelihood of liquid waste entering the drainage systems (contact Sydney Water to obtain trade waste requirements).

6) Communal storage/collection facilities are recommended where:

   a) The design makes it difficult for all tenants to have ready access to a collection point; or

   b) The site characteristics restrict vehicle entry.

7) Where a communal facility exists, each tenant should have a designated area which is clearly signposted.

8) Should a collection vehicle be required to enter the property, the driveway and manoeuvring area must be suitable for a collection vehicle in terms of both its strength and design.

9) The system for waste management must be compatible with the collection service(s) to be used whether Council or private contractor.

10) Swept paths demonstrating adequate manoeuvring area are to be provided with the application.

C. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the development specific waste management controls expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Incorporate and install a Building Management System which monitors the ongoing sustainability measures of the building and its occupants, such that it monitors the amount of recyclable waste and other waste being generated/collected as well as the amount that is disposed for recycle/reuse or sent to landfill.

b) Reduce the volume of demolition**,** construction and fit out waste, including excavation, going to landfill by 76%.

5.3. General Controls

A. Background

Waste minimisation needs to be an integral component of the design and construction phases of a development. Issues that should be considered early in the development process include:

a) Ensuring project management of the site includes minimising waste generation, requiring the appropriate storage and timely collection of waste materials, and maximising re-use or recycling of materials;

b) Selecting materials to maximise re-use and recycling of existing materials;

c) Ensuring the right quantity of materials are delivered at the right time in the construction process to avoid damage and wastage, and returning unused materials; and

d) Considering the re-use and recycling of any new materials at the end of the development's life.

Significant reductions in waste to landfill and cost-savings can be made at the demolition, earthworks and/or construction stage of a development by implementing the waste management plan.

B. Objectives

To encourage waste avoidance and resource recovery through planning, re-use and recycling by:

a) Improving project management of demolition or construction works to facilitate on-site source separation and appropriate collection of waste;

b) Ensuring that developments are designed to incorporate waste minimisation measures by facilitating source separation on site, the storage and collection of wastes and recyclables and providing maximum opportunities to use recycled materials; and

c) Minimising the total material resources used and encouraging the selection and use of materials with low environmental impact over the lifecycle of the building.

d) To ensure new developments are designed to maximise resource recovery through measures and features that promote waste avoidance, source separation and recycling.

e) To ensure new developments incorporate waste storage and waste collection areas that are accessible, safe and convenient for both occupants and service providers.

f) To promote measures which will ensure all waste streams are stored and handled appropriately to minimise adverse environmental, health and amenity impacts and which minimise risk to health and safety for all associated with waste collection and handling.

g) To reduce illegal dumping through providing well designed and appropriate bulky waste storage areas within the development.

5.3.1. Site Management

1) Proposals involving demolition and/or construction (including earthworks) are to include a Waste Management Plan which addresses the following issues:

   a) Minimising site disturbance and eliminating unnecessary excavation;

   b) Where applicable, stripping topsoil from areas subject to excavation and storing it on site for re-use;

c) Identifying all waste likely to result from the works on site and opportunities for the re-use or recycling of materials;

d) Where construction is proposed, determining:

   i) Opportunities for the use of prefabricated components and recycled materials;

   ii) Approximate volumes of materials to be used and incorporating these volumes into a purchasing policy so that the correct quantities are purchased;

   iii) Delivery arrangements of materials so that materials are delivered 'as needed' to prevent the degradation of materials through weathering and moisture damage; and

   iv) Opportunities to return excess materials to the supplier or manufacturer;

e) Considering the method of demolition to be utilised so that selective deconstruction is implemented, enabling effective recycling of materials;

f) Identifying the area(s) on site to be used for the storage of materials, separating the areas for recycling and disposal (giving consideration to access, slope, drainage, location of waterways, stormwater outlets and vegetation);

g) Ensuring that separated materials are to be kept uncontaminated to guarantee the highest possible reuse value;

h) Considering where excess fill material will be disposed of, the quantity and quality of the excess material and the method of transport to be used;

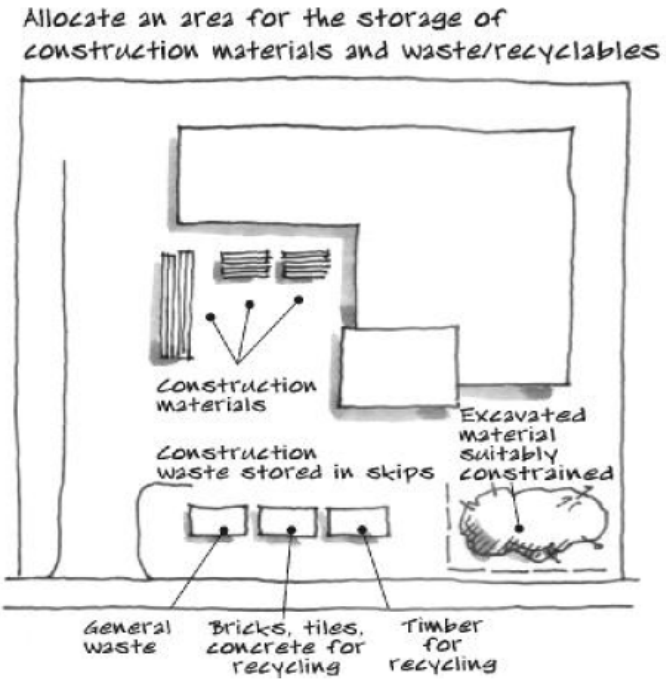
i) Identifying and providing measures to prevent the occurrence of windblown litter, dust and stormwater pollution;

j) Where applicable, ensuring that:

   i) Contractors are arranged for the transport, processing and disposal of waste and recycling; and

   ii) Evidence, such as weighbridge dockets and invoices for waste disposal or recycling services, is retained and available for presentation to Council Officers upon request.

Figure C5.5: Identify areas on site for storage of materials, waste and recyclables



5.3.2. Selection of Building Materials

1) Choose materials with low embodied energy properties and/or materials that have been salvaged/recycled for the construction/fit out of the development. Table C5.1 on the following page identifies the building materials that can be reused/recycled.

   Examples include:

   a) Concrete that utilises slag and fly ash content.

   b) Structural and reinforced steel that uses recycled steel content.

   c) Bulk insulation products that contain recycled content, such as recycled glass in glass-wool.

2) Choose certified plantation or engineered timber materials, and avoid unsustainable imported timber (such as western red cedar, oregon, meranti, luan or merbau).

3) Choose low volatile organic compound (VOC) materials, including low/no VOC paints and coatings, floor coverings and underlays, as materials with a high VOC or containing hydrofluoro-carbons can become volatile at room temperature contributing to poor indoor air quality and thus affecting the health of occupants.

Table C5.1: Materials and their Potential for Re-use and Recycling

Material	Re-use / Recycling Potential
Concrete	Re-used for filling, levelling, or road base
Bricks	Can be cleaned for re-use or rendered over or crushed for use in landscaping and driveways
Roof tiles	Can be cleaned and re-used or crushed for use in landscaping and driveways
Hardwood Beams	Re-used as floorboards, fencing or furniture or sent to second hand timber suppliers
Other Timber	Re-used as formwork, bridging, blocking and propping, mulching or sent to second hand timber suppliers
Doors, Windows, Fittings	Sent to second hand building suppliers
Glass	Re-used as glazing or aggregate for concrete production
Synthetic Rubber (carpet underlay)	Reprocessed for use in safety devices and speed humps
Overburden	Power screened and used as top soil
Green waste	Can be used for mulching, composting
Carpet	Can be sent to recyclers or reused in landscaping
Plasterboard	Removed for recycling, returned to supplier
Excavated material	Re-used on site or disposal to approved site
Plumbing and metal fittings	Recycled off-site

5.3.3. Designing for Waste Minimisation

1) The design of developments should incorporate principles on how waste can be minimised in the design by:
    a) Incorporating the use of modular components;
    b) Minimising excavation and fill (See the "Land Management" section of this Plan);
    c) Using prefabricated frames, trusses and cladding;
    d) Using standard material sizes or negotiating with manufacturers for the supply of non-standard material sizes;
    e) Selecting materials that do not require finishes;
    f) Grouping wet areas together to minimise the amount of pipe work required;
    g) Implementing measures to prevent the occurrence of windblown litter, dust and stormwater pollution;
    h) Incorporating existing trees/shrubs into the landscape plan;
    i) Designing for de-construction;
    j) Incorporating facilities for the source separation of wastes and recyclables (both internal and external); and
    k) Designing waste storage areas complementing the development and the surrounding streetscape.

5.3.4. Siting and Design of Waste Storage and Collection Areas

1) Waste storage and/or collection areas (or the required space for these facilities) should be available both on-site and within individual tenancies of all developments for the source separation of waste, recyclables and compostable materials.
2) The expected volumes of waste and recyclables generated by the construction and ongoing use of the development, including individual tenancies, must be calculated. The selection of appropriate waste equipment and the floor area requirements for waste storage will need to be an integral element of the design for the development.
3) Space must be provided to allow for the storage, access and manoeuvring of waste bins to facilitate ease of use and servicing.
4) Waste and recycling containers must be stored at all times on the site unless Council has issued an approval under the *Local Government Act 1993* to store waste in a public place.
5) All waste management facilities must comply with the *Building Code of Australia* and relevant Australian Standards.
6) The nominated collection area for the development on-site is to be clearly nominated on scaled site plans accompanying the development application.

5.3.4.1 Access to Waste Storage and/or Collection Areas

1) The design and location of waste storage and/or collection areas should allow for ease of access for both tenants and waste contractors and should be separated from the car parking area(s) or located away from the circulation path of other vehicles.
2) The location of the waste storage and/or collection area(s):

a) Is to be convenient and accessible to the occupants of all tenancies in the development; and

b) Must allow 120/240 litre bins to be wheeled to the street kerb over flat or ramped surfaces with a maximum grade of 7% and not over steps, landscape edging or gutters; or

c) Must allow for bulk garbage bin(s) to be wheeled out and be serviced by a front loading garbage truck on a flat surface with a maximum grade of 5%, and not over steps, landscape edging or gutters; and

d) Be screened or discreetly located away from public spaces.

3) There must be sufficient manoeuvring area on-site to allow collection vehicles to enter and leave the site in a forward direction and service the development efficiently with little or no need to reverse.

5.3.4.2 Design of Waste Storage and/or Collection Areas

1) The design and location of waste storage and/or collection areas are an integral part of the development's design and should complement the public domain by:

a) Reducing potential noise and odour impacts;

b) Being well lit and well ventilated, with appropriate measures installed so as to prevent vermin; and

c) Enhancing public safety.

2) Waste storage and/or collection areas must have access to a water outlet for washing purposes, with wash water discharging to an approved sewer outlet.

3) Waste equipment should be protected from theft and vandalism.

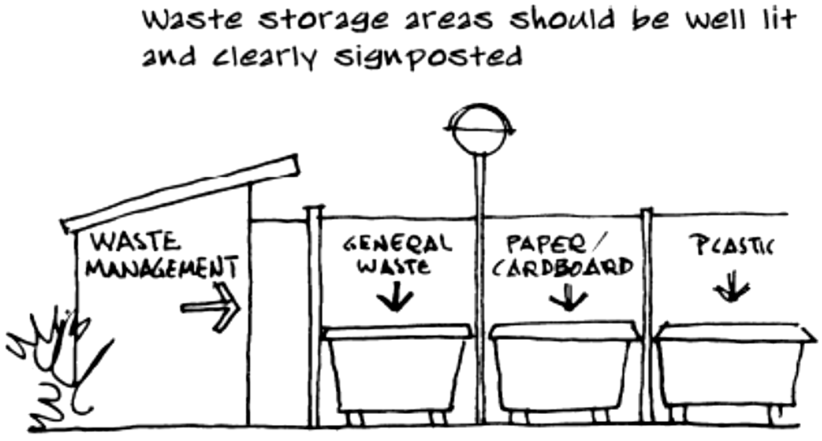
5.3.5 Management of Waste Storage and Collection Areas

1) Administrative arrangements for ongoing waste management must be provided, including signs.

2) Waste storage and/or collection areas (including individual containers) should be suitably signposted so as to ensure appropriate use.

3) The responsibility for the ongoing management of waste facilities must be determined prior to the commencement of construction work on a development.

Figure C5.6: Waste storage areas should be well lit and clearly signposted



C. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the general waste management controls expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Ensure the design and fit out of the development is above the 4 star rating under Green Star or 4.5 star rating under the Australian Building Greenhouse Rating system, now part of the National Australian Built Environment Rating System (NABERS), depending on the type of development;

b) Reduce the use of timber from old growth forests, rainforests and forests/plantations which do not have certified environmentally responsible forest management practices. Applicants need to demonstrate that a significant percentage of the timber and composite timber products used in the building and construction works is from Forest Stewardship Council Certification, utilises reused or recycled timber or is specified using the Friends of the Earth 'Good Wood Guide' 9th Edition; and

c) Reduce the volume of demolition**,** construction and fit out waste, including excavation, going to landfill by 76%.

5.4. Hazardous Waste Management

The NSW Environment Protection Authority (EPA) generally regulates the management of hazardous waste. Therefore, any applications that will involve hazardous waste may require a licence or permit from the EPA in addition to approval from Council. Please contact Council or the EPA to discuss the requirements for hazardous waste.

5.5. On-Site Sewage Management

The need to provide on-site sewage management is set out in the 'Infrastructure and Services' Section of this Plan.

The location and design of on-site sewage treatment and disposal is regulated by Council. (See Penrith City Council's *On-site Sewage Management and Greywater Reuse Policy,* 2014).

Please contact the Council to discuss the most suitable on-site sewage management system for your development.