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465-469 Princes Highway & 5-7 Geeves Avenue, Rockdale NSW 2216

COMBINED DEMOLITION/CONSTRUCTION & OPERATIONAL WASTE MANAGEMENT PLAN

Proposed Mixed-Use Development

Co-Living & Commercial Shops

Client - EMAG-Apartments Pty Ltd

Revision - 1A

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Archer Consultants Pty Ltd was engaged by EMAG Apartments Pty Ltd to prepare a Waste Management Plan (WMP) for approval of a proposed mixed-use development at 465-469 Princes Highway &

5-7 Geeves Avenue, Rockdale NSW 2216.

The proposed development consists of;

DEVELOPMENT DETAILS
GROUND LEVEL: COMMERCIAL UNIT 1 (85.8m <sup>2</sup> ), COMMERCIAL UNIT 2 (289m <sup>2</sup> ),
LEVEL 1: 15 x DBLE, 1 x SGL = 16 UNITS (281.8m <sup>2</sup> ) INDOOR COMMUNAL (94.5m <sup>2</sup> ), OUTDOOR COMMUNAL (83.4m <sup>2</sup> )
LEVEL 2: 15 x DBLE, 1 x SGL = 16 UNITS (285.2m <sup>2</sup> ) INDOOR COMMUNAL (117.15m <sup>2</sup> )
LEVEL 3: 10 x DBLE, 2 x SGL = 12 UNITS (198.8m <sup>2</sup> ) INDOOR COMMUNAL (74.5m <sup>2</sup> )
LEVEL 4: 11 x DBLE, 3 x SGL = 13 UNITS (215.8m <sup>2</sup> ) INDOOR COMMUNAL (42m <sup>2</sup> )
<b>LEVEL 5:</b> 11 x DBLE, 4 x SGL = 15 UNITS (241.3m <sup>2</sup> )
<b>LEVEL 6:</b> 9 x DBLE, 5 x SGL = 14 UNITS (204.6m <sup>2</sup> )
<b>LEVEL 7:</b> 7 x DBLE, 7 x SGL = 14 UNITS (203.2m <sup>2</sup> )
<b>LEVEL 8:</b> 7 x DBLE, 7 x SGL = 14 UNITS (203.2m <sup>2</sup> )
<b>LEVEL 9:</b> 7 x DBLE, 7 x SGL = 14 UNITS (203.2m <sup>2</sup> )
LEVEL 10: 7 x DBLE, 7 x SGL = 14 UNITS (203.2m <sup>2</sup> )
LEVEL 11: 7 x DBLE, 7 x SGL = 14 UNITS (203.2m <sup>2</sup> )
<b>TOTAL:</b> 106 x DBLE, 51 x SGL = 157 UNITS (2,161.7m <sup>2</sup> )

In the course of preparing this WMP, the subject site and its environs have been inspected, plans of the development examined, and all relevant council requirements and documentation collected and analysed.

This WMP has been prepared based on the following information:

- Architectural Plans provided by Axel Richter Architect.
- Rockdale DCP Part 3N Waste Minimisation and Management& EPA Better Practice Guide for Resource Recovery in Residential Developments (2012-2019 Editions).

The subject site is located at 465-469 Princes Highway & 5-7 Geeves Avenue, Rockdale NSW, on the west side of Rockingham Road, and the nearby land uses are mostly commercial properties with residential properties to the west.

Figure 1 provides an overview of the area, and its surrounding land uses whilst Figure 2 provides an aerial view of the immediate area surround the subject site.

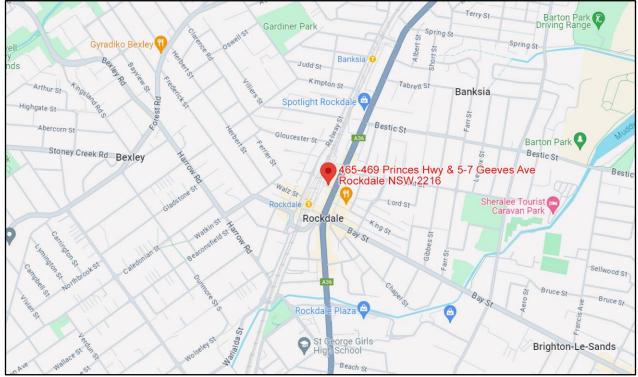


Figure 1: Subject Site Location

Source: Google Maps



Figure 2: Subject Site Aerial View

Source: Google Maps

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



#### Avoid/Reduce

Particularly during the construction phase, avoidance of waste will be achieved through:

- Selecting design options with the most efficient use of materials;
- Selecting materials with minimal wastage, such as prefabricated materials.

#### Reuse

Some of the materials encountered in the demolition stage can be recovered and reused both onsite and off-site. This will be practiced wherever possible. Reusable materials shall be appropriately stored to avoid damage from weather or machinery.

#### <u>Recycle</u>

Similarly, many materials form the demolition stage will be recyclable. These materials will be identified prior to demolition, and a system incorporated to efficiently separate reusable materials, recyclable materials and disposable materials. Recyclable materials shall be appropriately stored to avoid damage from weather or machinery. Details and receipts verifying the recycling of these materials shall be kept present on site at all times.

#### Disposal

The waste disposal contractor chosen for the job will comply with Council's DCP. Details and receipts verifying the disposal of these materials shall be kept present on site at all times.

#### Handling

When handling waste on-site, the system (including bin placement, volumes, and access) shall be designed with the following factors in mind:

- Safety (highest priority);
- Ease of use; and
- Aesthetics.

#### Stockpiling

Waste sorting areas and vehicular access on-site during demolition and construction shall be adequately maintained. The material (demolition material, excavation material, construction material and waste) stockpiling area shall always remain within the site boundary and relocate during different demolition and construction stages as necessary. The waste area shall be largely located at the front of the site. This is to maintain easy access and removal of waste. The stockpiling area shall not infringe on access to the site, however. Hoardings shall bind the site perimeter; therefore, the waste shall not be visible from the street.

The proposal consists of the demolition of the existing structures construction of a Co-Living & Commercial development.

#### **Demolition Works**

It should be noted that the demolition stage has the greatest potential for waste minimisation, particularly in facility is in Sydney where there are high levels of development, relatively high tipping charges and where alternative quarry materials are located on the outskirts.

The contractor should consider whether it is possible to re-use existing buildings, or parts thereof, for the proposed use. With careful onsite sorting and storage and by staging work programs it is possible to re-use many materials, either on-site or off-site.

Councils are typically seeking to move from the attitude of straight demolition to a process of selected deconstruction, i.e. total reuse and recycling both off-site and on-site. This could require a number of colour-coded or clearly labelled bins onsite (rather than one size fits all).

Site contractors should demonstrate project management which seeks to:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used in landscaping either on-site or off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard re-used in landscaping on-site, or returned to supplier for recycling;
- Framing timber re-used on-site or recycled elsewhere;
- Windows, doors and joinery recycled off-site;
- Plumbing, fittings and metal elements recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Workcover Authority and EPA requirements.

**NOTE**: Disposal of hazardous chemicals is regulated and must be tracked (Certified Trackable Waste Transporter) under the chain of custody and chain of responsibilities, philosophies with the site manager ultimately responsible for logistics and all waste generated on site;

- Locations of on-site storage facilities for material to be reused on-site, or separated for recycling off-site; and
- Destination and transportation routes of all materials to be either recycled or disposed of offsite.

#### Construction Works

The following measures shall be considered during the construction stage in order to save resources and minimise waste:

- Purchasing Policy i.e. ordering the right quantities of materials and prefabrication of materials where possible;
- Reusing formwork;
- Minimising site disturbance, limiting unnecessary excavation;
- Careful source separation of off-cuts to facilitate re-use, resale, or efficient recycling; and
- Co-ordination/sequencing of various trades.

There are many simple techniques to estimate volumes of construction and demolition waste. The sequence of steps provided below can be used as a guide;

- 1) Quantify materials for the project
- 2) Use margin normally allowed in ordering
- 3) Copy these amounts of waste into your waste management plan

When estimating waste generation, the following percentages can be used as a "rule of thumb" practice;

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

Table 1: Estimating Waste Levels

Subsequently, the following table illustrates how to convert volumes of material to their respective weights. This information is particularly important during material storage and transportation stages.

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

Table 2: Converting Volume into Weight

## WASTAGE TYPES AND HANDLING

Waste volumes produced by excavation, demolition and construction stages shall be estimated by the contractor at the construction certificate stage. Where possible, materials shall be reused or recycled, with disposal being the last resort. The destination of all recycled and disposed material shall be announced upon the selecting the waste collectors and recyclers.

**NOTE:** The arrangements for all reused, recycled and disposed waste shall be tracked and recorded providing an auditable database, with all receipts to be held on-site.

Refer to Appendix A – Waste Management Contacts for waste contractor details.

Tables 3: Waste Types and Handling

#### **Demolition Phase**

Materials on Site	Waste Estimate Volume (m <sup>3</sup> ), Area (m <sup>2</sup> ) or Weight (T)	On-Site Reuse Specify how materials will be reused or recycled on-site	Off-Site Recycling Specify the contractors and recycling outlet	Off-Site Disposal Accordance with DECCW
Excavation Material	ТВА			
Green Waste	TBA			
Bricks	TBA			
Ceramic Tiles	TBA			
Concrete	TBA			
Plasterboard	ТВА			
Timber	ТВА			
Metals	ТВА			
Other Waste	ТВА			
Asbestos	ТВА			
Hazardous	ТВА			

The Demolition reuse/recycling/disposal information will be advised at CC Stage.

#### **Construction Phase**

Materials on Site	Waste Estimate Volume (m <sup>3</sup> ), Area (m <sup>2</sup> ) or Weight (T)	On-Site Reuse Specify how materials will be reused or recycled on-site	Off-Site Recycling Specify the contractors and recycling outlet	Off-Site Disposal Accordance with DECCW
Soil, Sand & Rubble	TBA			
Bricks	TBA			
Ceramic Tiles	TBA			
Concrete	TBA			
Plasterboard	TBA			
Timber	TBA			
Metal (Ferrous, Iron, Steel and Black Iron)	TBA			
Metal (Non-Ferrous, Aluminium, Copper, stainless Steel and Wire)	TBA			
Cardboard & Paper	ТВА			
Plastic	TBA			
Other Waste	ТВА			
General Waste (Landfill)	ТВА			

# WASTE COLLECTION (DEMOLITION & CONSTRUCTION STAGE)

The waste collection service for the proposed demolition and construction stage of the development will be provided by a private waste contractor.

**NOTE:** All vehicle movements and strategic placement of the bins on site, ensuring the bins are relocated when needed during the works to maintain safe access and use at all times, will be provided by the site manager. Supporting documentation/receipts to be retained in order to verify the disposal of materials in accordance with the approved plan.

#### Demolition & Construction Waste Security/Communication Strategy

All demolition and construction bins will be secured on site with all site workers receiving documentation detailing all necessary requirements for safe waste management and handling whilst attending the site health and safety induction course.

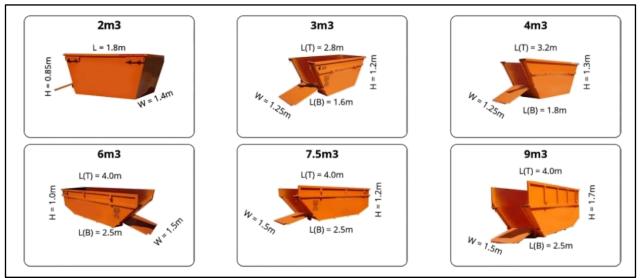


Figure 3: Typical Waste Skips for Demolition & Construction Site Waste Management

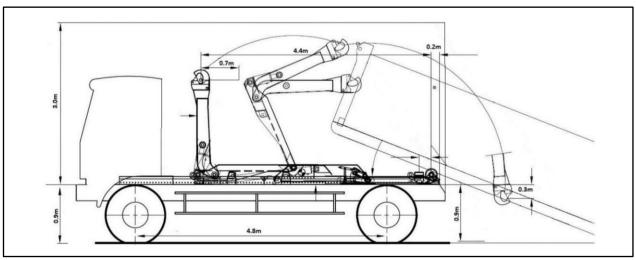


Figure 4: Typical Hook Lift Waste Collection Vehicle Configuration

## OPERATIONAL WASTE MANAGEMENT, STORAGE AND COLLECTION

The proposed development consists of mixed-use development. Access to the proposed front entrance of the development will be provided via a paved walkway off Greeves Avenue and Princess Hwy with driveway access off Greeves Lane. The Mobile Garbage bins (MGB's) will be stored in the ground level waste storage collection rooms. **(Refer Appendix B).** 

## ANTICIPATED WASTE GENERATION, STORAGE & COLLECTION

Waste collection will be provided by private contracted waste services.

#### Waste Generation

As per the Rockdale DCP Part 3N - Waste Minimisation and Management& EPA Better Practice Guide for Resource Recovery in Residential Developments (2012-2019 Editions),

The waste entitlement for the development consists of: (a) Co-Living are  $30L/100m^2$  of floor area per day general waste and  $30L/100m^2$  of floor area per day recycling waste. (b) Cafés are  $10L/1.5m^2$  of floor area per day general waste and  $2L/1.5m^2$  of floor area per day recycling waste (c) Retail Shops (More than  $100m^2$ ) are  $50L/100m^2$  of floor area per day general waste and  $50L/100m^2$  of floor area per day recycling waste (Inclusive of paper & cardboard waste).

The following table illustrates the typical garbage and recycling generation rates.

Type of Premises	General Land Waste	Commingled Recycling Waste
Co-Living	30L/100m <sup>2</sup> floor area/day	30L/100m <sup>2</sup> floor area/day
Café	10L/1.5m <sup>2</sup> floor area/day	2L/1.5m <sup>2</sup> floor area/day
Retail Shops (More than 100m <sup>2</sup> )	50L/100m <sup>2</sup> floor area/day	50L/100m <sup>2</sup> floor area/day

Table 4: Typical General and Recycling Waste Generation Rates for Mixed-Use Developments

NOTE: Generation rates based on weekly rates within the Rockdale DCP Part 3N - Waste Minimisation and Management & EPA Better Practice Guide for Resource Recovery in Residential Developments (2012-2019 Editions). Actual usage can vary and may be generated at a reduced rate. Management will monitor all waste requirements and handling. Accessing any needs for waste management plan revisions.

Waste within Overall Development

Using the garbage and recycling generation rates above, the following can be calculated;

#### Co-Living: 106 x DBLE, 51 x SGL = 157 UNITS (2,161.7m<sup>2</sup>)

- 30L/100m<sup>2</sup> of floor area per day general waste = 4,539.57L per week (uncompacted)
- 30L/100m<sup>2</sup> of floor area per day recycling waste = 4,539.57L per week (uncompacted)

#### Café: (85.8m<sup>2</sup>)

- 10L/1.5m<sup>2</sup> of floor area per day general waste = 4,004L per week (uncompacted)
- 2L/1.5m<sup>2</sup> of floor area per day recycling waste = 800.8L per week (uncompacted)

#### Retail Shops (More than 100m<sup>2</sup>): (289m<sup>2</sup>)

- 50L/100m<sup>2</sup> of floor area per day general waste = 1,011.5L per week (uncompacted)
- 50L/100m<sup>2</sup> of floor area per day recycling waste = 1,011.5L per week (uncompacted)

#### Waste Storage and Handling of Waste Streams

Based on the total waste generated by the development, the following Mobile Garbage Bins (MGBs) should be provided:

#### **Co-Living Waste Room**

- 2 x 1,100L General Waste MGB's collected and emptied twice a week.
- 5 x 1,100L Recycling Waste MGB's collected and emptied once a week.

**NOTE**: A spare 1,100L General Waste MGB to stay under the waste chute whilst the MGB's are being emptied by the waste contractor. Spare 240L Recycling MGB's will be used as changeover MGB's on the upper levels. The building manager will use the bin lift to empty the 240L Recycling MGB's into the 1,100L MGB's at least twice a week or as per required.

The communal areas generated waste on the upper levels will be offset by the waste normally generated within the co-living units, therefore residents will place their waste within the general waste chute and recycling MGB's as needed.

#### Commercial Waste Room

- 1 x 1,100L General Waste MGB's collected and emptied 5 times a week.
- 1 x 1,100L Recycling Waste MGB's collected and emptied 2 times a week.

NOTE: Commercial Tenants will place their waste within the 1,100L MGB's as needed.

The following table illustrates the typical dimensions of the MGB's mentioned above.

Size (L)	Height (mm)	Width (mm)	Depth (mm)	Approx. Footprint (m²)
240L	1,080	580	735	0.43
1,100L	1,470	1,370	1,245	1.33-1.74

Table 5: Typical Measurements for the (Mobile Garbage Bins) MGB's

## Recycling



Garbage



Figure 6: Typical 60-240L Bin lift

The following figure illustrates the scaled diagram of the MGB's within the upper-levels and waste storage/collection rooms.

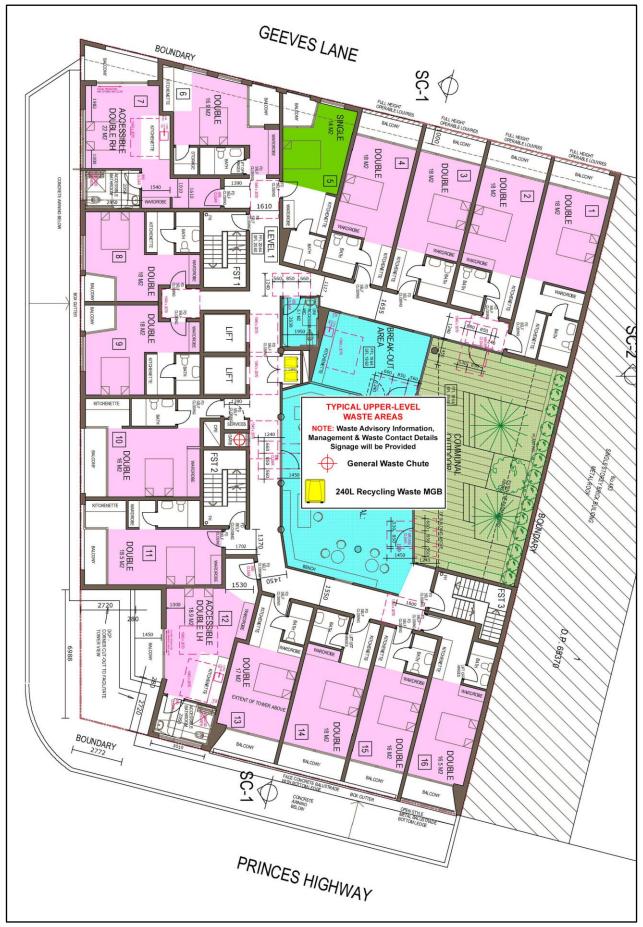


Figure 8: Scaled Diagram of a Typical Upper-Level Waste Storage Collection Area

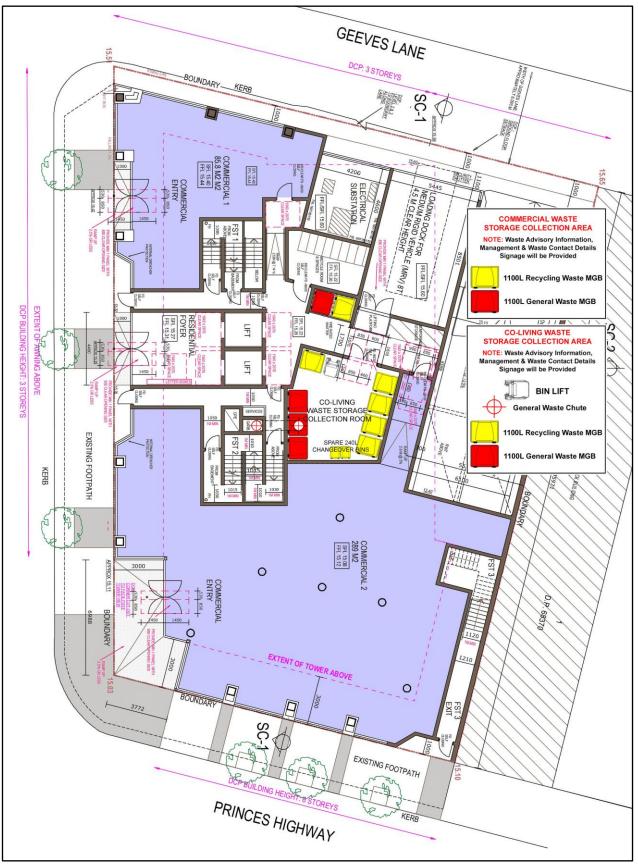


Figure 9: Scaled Diagram of the Ground Level Waste Storage Ares

Waste collection should be provided by private waste contracted services.

The waste collection vehicle will reverse into the loading bay off Greeves Lane. Ferry the MGB's to/from the waste storage collection rooms via the lifting platform and waste vehicle emptying the MGB's. Once all the MGB's have been emptied and returned to the waste storage collection rooms, the vehicle will leave in a forward motion.

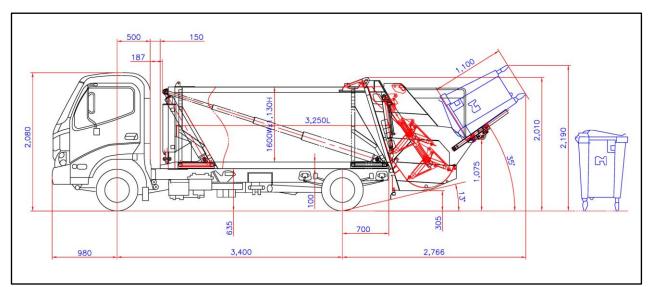


Figure 10: Diagram of a Typical SRV Waste Collection Vehicle

#### Noise

The only noise generated from the waste management at the property will be that of the MGB's being collected and emptied. Any other noise related to the waste management will be kept to a minimum.

#### Ventilation

The waste storage room should be ventilated.

Security & Communication Strategy

All MGB's will be secured within the waste storage area.

Management, staff, tenants and residents will receive detailed documentation detailing all necessary requirements for safe waste management and handling, including all relevant contact information.

NOTE: It is recommended that all bins and areas should have appropriate signage showing acceptable and non-acceptable items for each bin.

#### Waste Storage Enclosures & Cleaning Facilities

Management will be responsible for keeping the MGB's clean.

NOTE: It is required that the waste bin enclosure consist of; **(1)** Smooth impervious coated/treated ground surface, ensuring the ground is graded to the sewer (100 mm diameter) floor drain outlet. **(2)** Tap (hot and cold) and hose (hose cock must be protected from the waste containers) for use of cleaning the MGBs and waste area. **(3)** Waste educational signage with managements contact details.

#### Prevention of Vermin

The occupants will be advised to not overfill the bins so that the lids are closed at all times. It is suggested to place rat traps in the corners of the waste storage areas.

#### Composting Facilities

Organic waste is a problem in landfill as it produces methane, a harmful greenhouse gas that is 25 times more potent than carbon dioxide. Turning it into compost reduces the impact on the environment and allows waste to become a usable product. Existing landfill sites are also nearing capacity, and the creation of new sites can cause significant detrimental effects through land clearing, loss of habitat for local wildlife, and potential groundwater and soil contamination from the leaching of heavy metals and chemicals.

Residents can decide to commit to improving waste management methods by composting in support of social and environmental commitments at the local level by using **Bokashi Anaerobic Composting** bins that can be stored indoors or outdoors. It's a great way to turn your kitchen scraps into rich liquid and semi-solid fertiliser.

#### Internal Waste Storage

It is suggested that sufficient space, should be provided for interim storage of smaller bins in strategic areas for garbage and recyclables. Space should allow for separate storage of recyclables from the garbage streams

#### Organic (Food/Green) Waste

Food waste will be placed in the general waste chute and MGB's. Gardening waste will be handled by the private gardening contractor. <u>*Please refer to Composting Facilities above.*</u>

#### Bulky Waste Storage

If bulky hard waste collection is required management, should contact a private waste contracted service to organise collection.

#### E-Waste

Recyclable electronic goods include batteries, equipment containing printed circuit boards, computers, televisions, fluorescent tubes, light bulbs, and smoke detectors. E-Waste is expected to be minimal therefore, all waste will be placed in a small impermeable surface container and management will organise for the E-Waste to be taken to a registered E-Waste Re-Processor as required or taken to hazardous waste stations in the City's libraries or at the Henderson Waste Recovery Park.

## APPENDIX A – WASTE MANAGEMENT CONTACTS

Materials	Company Name Company Address		Contact Details
Evacuation Material/Soil Waste	Enviroguard	Cnr Mamre & Erskine Parks Roads, Erskine Park	9834 3411
Green Waste	Ecocycle	155 Newton Road, Wetherill Park	9757 2999
Bricks	Brandown	Lot 9 Elizabeth Drive, Kemps Creek	9826 1256
Concrete	Brandown	Lot 9 Elizabeth Drive, Kemps Creek	9826 1256
Timber	Artistic Popular Furniture	10 Raglan Road, Auburn	9644 3054
Metals	Parramatta Scrap Metal	12 North Roack Road, Nth Parramatta	9630 2974
Roof Tiles	Obsolete Tiles	3 South Street, Rydalmere	9684 6333
Door Fittings	Recycling Works	45 Parramatta Road, Annandale	9517 2711
Plastics	Cromford	120-122 Ballandella Road, Pendle Hill	9631 6644
Plasterboard	Ecocycle	155 Newton Road, Wetherill Park	9757 2999
Fibro Containing Asbestos	Enviroguard	Cnr Mamre & Erskine Parks Roads, Erskine Park	9834 3411

NOTE: Disposal of hazardous chemicals is regulated and must be tracked (Certified Trackable Waste Transporter) under the chain of custody and chain of responsibilities, philosophies with the site manager ultimately responsible for logistics and all waste generated on site.

