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Waste Management Plan for

23-29 Harvey Avenue, Moorebank NSW

Prepared by

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1. Introduction

Loka Consulting Engineers Pty Ltd has been engaged by Pagano Architects to provide a Waste Management Plan for the site at 23-29 Harvey Avenue, Moorebank 2170 NSW within the Liverpool LGA (refer to Figure 1.1 and Figure 1.2).

A waste management plan and report is required for the proposed development to support the design during demolition, construction and service conditions, along with achieving the objectives to promote sustainable operation of the development. The development achieves the waste management objectives set out in the council codes as well as any statutory requirements. The details which will be addressed include:

- a description of the site and details of the development proposal;
- reuse, recycling and disposal of materials during demolition, excavation, construction and service conditions;
- a review of the design features of the proposed waste management system for compliance with relevant codes, standards and regulations; and
- identification of procedures for on-going waste management.

Figure 1.1: Subject site (Source: SIX Maps)

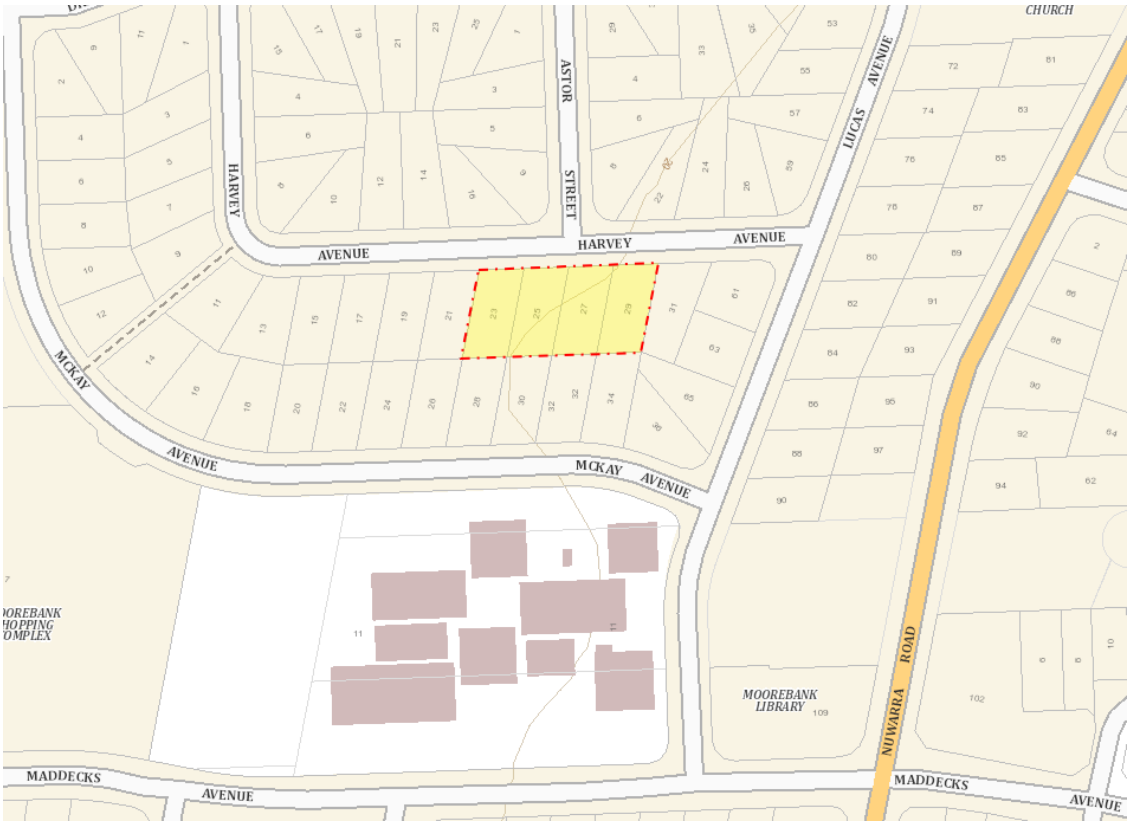

Figure 1.2: Site location (Source: SIX Maps)

2. Property Description

The proposed development will facilitate the construction of five storey residential flat building with an approximate site area of 2745.2m^2. The building has 2 main blocks; each has the same number of units. The number of units on every level in each block is listed below.

- Ground level: 5 units
- Levels 1 and 2: 6 units
- Levels 3 to 5: 4 units

The proposed residential flat building is bounded by Harvey Avenue on the North, 31 Austral Ave on the East, 21 Austral Ave on the West, and 28 McKay Avenue on the South.

Every level is allocated with one garbage room in each block designated for general waste & recycle chute and there are two garbage rooms located on basement level 1 designated for collecting general waste & recycle.

3. Project Proposal

The proposed new development will involve the demolition of existing dwellings and the construction of the residential flat building with 2 levels of basement carpark.

Waste storage and transportation will be managed during excavation and construction stages as well as in service conditions. Waste produced from the excavation and construction stages will be reused or recycled as appropriate, or disposed using certified waste collection contractors.

The management of waste during service conditions of the residential building will involve the building manager maintaining Waste Storage and Recycling Area located on site, with the collection of general waste and recycling primarily involving the Council. It is proposed that **10 x 660L** Garbage bins and **10 x 660L** recycling bins are provided. These mobile bins will be collected once a week at the street kerb by the Council.

4. Demolition & Excavation

Materials from the demolition stage shall be reused, recycled or disposed in accordance with the provisions outlined in this WMP and the requirements of the Protection of the Environment Operations (Waste) Regulation 2014.

Where possible, waste materials should be managed so most materials will be reused or recycled, with only a small proportion of waste going to landfill.

Asbestos waste must be stored on the site in a manner that does not pose a risk to people or the environment. Asbestos will be disposed by a licensed removal contractor. Asbestos-contaminated soils must be wetted down All asbestos waste must be transported in a part of the vehicle that is covered and leak-proof; and disposed of at a landfill site that can lawfully receive it. The project manager will ensure a unique consignment number is created and report to EPA using Waste Locate if over 100 kilograms or 10 square meters of asbestos is being disposed of. No asbestos waste is disposed to general waste or recycle bin; or reuse, recycle or illegally dumped.

4.1 Managing Materials from Demolition

Table 1 below details the amount of material that is estimated to be produced from the demolition stage, as well as the planned reuse, recycling or disposal plans.

Table 1: Management of demolition materials

Materials on-site		**Reuse and recycling**		
Type of Material	**Estimated volume (m^3) or area (m^2) or weight (t)**	**On-site** How materials will be reused or recycled on-site	**Off-site** Contractor and recycling outlet	**Disposal** Contractor and landfill site
Timber	60m^3	Reuse for formwork, landscaping, shoring	Cleanaway Moorebank	Cleanaway Moorebank
Concrete	80m^3	Clean & reuse for landscaping	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill
Bricks/Pavers	120m^3	Clean & reuse for landscaping, bricks in good condition used for internal walls	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill
Roof tiles	60m^3	Clean & reuse for landscaping	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill
Plasterboard	40m^3	Break up and use in landscaping	Liverpool Community Recycling Centre, Liverpool NSW 2170	Liverpool Community Recycling Centre, Liverpool NSW 2170
Metals	20m^3	N/A	Bingo Recycling Centre, Revesby NSW 2212	Bingo Recycling Centre, Revesby NSW 2212

4.2 Managing Materials from Excavation

Excavated materials from the Excavation stage shall be reused, recycled or disposed in accordance with the provisions outlined in this WMP and the requirements of the Protection of the Environment Operations (Waste) Regulation 2014.

Table 2: Management of Excavated materials

Materials on-site		**Reuse and recycling**		
Type of Material	**Estimated volume (m^3) or area (m^2) or weight (t)**	**On-site** How materials will be reused or recycled on-site	**Off-site** Contractor and recycling outlet	**Disposal** Contractor and landfill site
Excavated material	8,200m^3	Reuse for backfilling, landscaping	Bingo Recycling Centre, Revesby NSW 2212	Bingo Recycling Centre, Revesby NSW 2212
Concrete	1m^3	Clean & reuse for landscaping	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill

4.3 Site Operation and Management

The site operation will be managed to reduce waste creation and maximise reuse and recycling by setting waste management requirements in contracts with sub-contractors, on-going checks by supervisors on site and the use of clear signage at designated waste areas.

In addition the project team leader will:

- Liaise with contractors to identify areas where they can reduce waste and reuse materials in their respective trades
- Meet local, state and federal waste minimisation legislation and environmental standards
- Prevent pollution and damage to the environment
- Protect the safety and health or our employees and the public

Waste will be separated and stored onsite for reuse and recycling through maintaining separate areas for sorted wastes with one area for recyclables and another area for waste going to landfill. Utilising selective deconstruction rather than straight demolition will ensure that good quality material can be reused or recycled.

5. Construction

Materials that are not used in the construction stage shall be reused, recycled or disposed in accordance with the provisions outlined in this WMP and the requirements of the Protection of the Environment Operations (Waste) Regulation 2014.

Where possible, waste materials should be managed so most materials will be reused or recycled, with only a small proportion of waste going to landfill.

5.1 Managing Waste Materials from Construction

Table 3 below details the amount of waste material that is estimated to be produced from the construction stage, as well as the planned reuse, recycling or disposal plans.

Table 3: Management of waste construction materials

Materials on-site		**Reuse and recycling**		
Type of Material	**Estimated volume (m^3) or area (m^2) or weight (t)**	**On-site** How materials will be reused or recycled on-site	**Off-site** Contractor and recycling outlet	**Disposal** Contractor and landfill site
Green waste	$5m^3$	Use for landscaping on-site	N/A	Nil to landfill
Timber	$15m^3$	N/A	Cleanaway Moorebank	Cleanaway Moorebank
Concrete	$10m^3$	Clean & reuse for landscaping	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill
Bricks/Pavers	$20m^3$	Clean & reuse for landscaping, bricks in good condition used for internal walls	Concrete Recyclers 14 Thackeray St, Camellia NSW 2142	Nil to landfill
Plasterboard	$15m^3$	Break up and use in landscaping	Liverpool Community Recycling Centre, Liverpool NSW 2170	Liverpool Community Recycling Centre, Liverpool NSW 2170

5.2 Construction Design and Management

Waste avoidance has been incorporated into the design by incorporating as much detail as possible within the design, and using pre-fabricated materials to ensure a reduction in waste generated on-site. Materials purchased will be checked against previously known quantities required to build similar projects, and adjusted as construction progresses for this particular project. Reduction in waste can also be achieved through the reuse of building materials in good condition from the demolition phase.

6. Management of Waste

6.1 Design Requirements

6.1.1 Waste production and storage per dwelling

Waste services will be provided by the Council to the development.

According to Liverpool City Council "Waste management services for residential flat buildings and multi dwelling housing", the waste generation rates are as follow:

- Waste Generation for 660L bins – 1 per 6 units collected weekly
- Recycling Generation for 660L bins – 1 per 6 units collected weekly

The waste generated and required number of bins is shown in Table 4.

Table 4: Calculations for waste/recycling storage space required

Service type	No. of Units	Required bins
Waste	58	10 x 660L
Recycling	58	10 x 660L

6.1.2 Collection frequency and bins required

To service the generation of waste/recycling expected from the development, the following number of bins and frequency of collection is outlined in the Table 5 below.

Table 5: Waste collection service requirements

Service type	Number of containers	Collection frequency
Waste	10 x 660L waste bins	Once per week
Recycling	10 x 660L recycling bins	Once per week

6.2 Design Detail

6.2.1 Overall waste and recycling storage and servicing within the complex

Two (2) waste and recycling storage rooms are proposed for the development are located on basement level 1 next to the lift.

The 660L plastic bin size obtained from council's fact sheet is 1420mm (L) x 780mm (W) x 1210mm (H). Considering the bins will be split into half for each waste room, the total area of waste bins per bin room is 11.6m^2. The total floor area of waste room 1 is approximately 32m^2 and waste room 2 is approximately 29m^2. Therefore, both waste rooms can accommodate the waste bins. Strata shall manage the bins as required for the garbage chutes.

2 waste rooms each with a garbage chute and space for a 240L recycling bin are proposed on each residential level. Signage and written information will be provided, so the occupants are aware of how to use the chute. The occupants must bag their waste before depositing into the chutes, however recycling must not be bagged. The 240L recycling bins will not be supplied by council and by an external contractor. Strata shall transport these bins to the basement waste rooms where the recycling materials will be transferred into the 660L recycling bins by using bin lifters as shown in Figure 6.1 below. The emptied 240L bins shall be transferred back in to the waste rooms on the residential levels.

Figure 6.1: Bin lifter

A bin trailer as shown in Figure 6.2 below will then be used to transfer all 660L bins from basement waste rooms to kerb side for council collection.

Figure 6.2 Bin trailer

Bin collection point is shown in Figure 6.3 below and due the following reasons:

- Harvey Ave is approximately 7m wide,
- the development is in a low residential area,
- bin collection will only occur in early mornings,
- there is no existing and proposed footpath,

there shall be no practical effect on the traffic condition when the garbage truck is collecting the bins. The 660L bins shown (10 x waste & 10 x recycling) are based on council's fact sheet 1420mm (L) x 780mm (W) and the garbage truck shown is 12.5m HRV as indication.

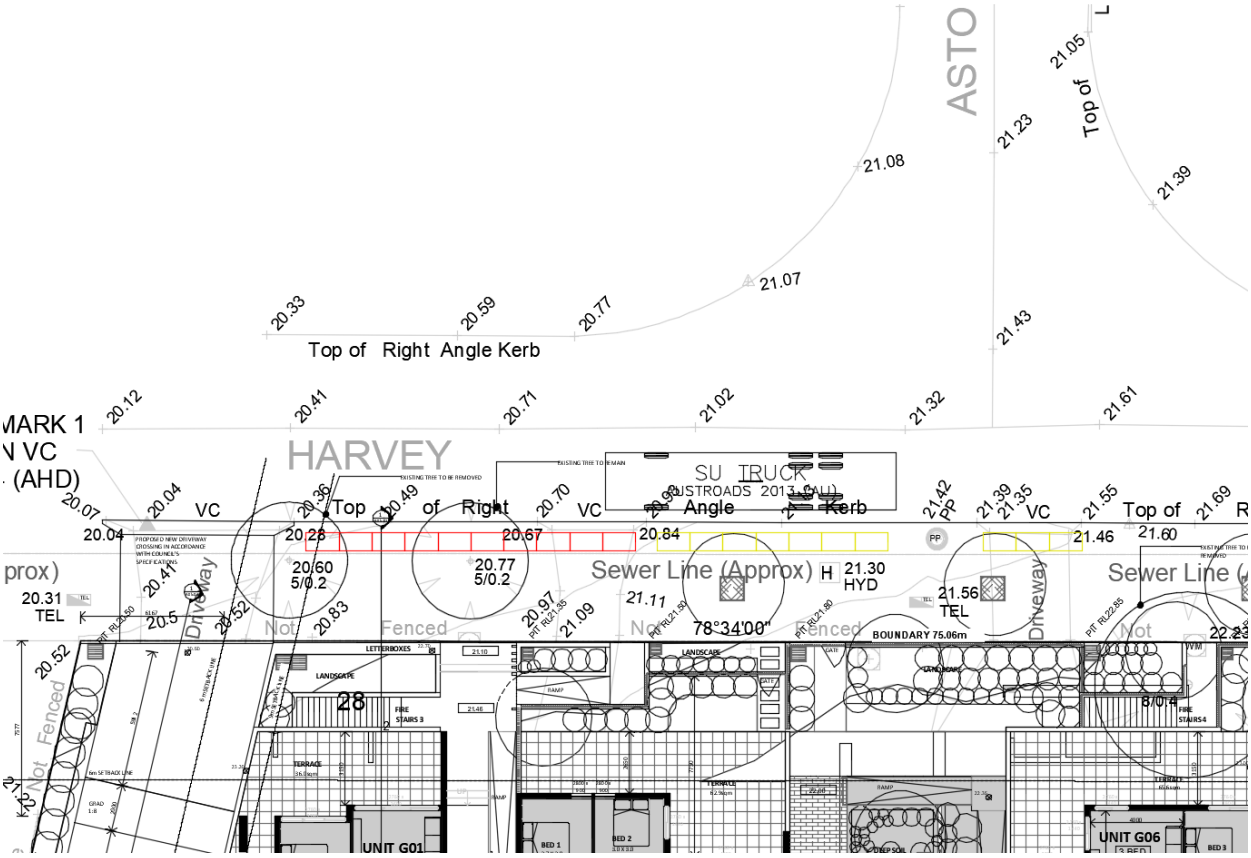

Figure 6.2 Bin trailer

6.2.2 Bulky waste

Bulky waste storage is provided and separated from waste bins. The bulky waste storage area is approximately 18.8 m^2. Access door shall be amended to double-leaf at CC stage. Signage and written information will be provided, so the occupants are aware of storing bulky household waste here instead of putting on kerbside.

6.2.3 Green waste

Green waste will not be serviced in this development as this component is considered negligible. The building management will provide services to cater for any green waste accordingly.

6.3 Further Design Requirements

Other design details that will be required as per Council and other relevant regulations are listed below:

- Waste water in waste storage areas discharge to sewer, with a cold water tap to facilitate cleaning of floor waste
- Waste storage is aesthetically pleasing and integrated with overall design
- Floors and walls are to be finished with a smooth, impervious and easily cleaned material
- Cavities and penetrations are to be sealed to prevent access to vermin
- Inclusion of signage to guide correct usage of facilities in compliance with AS1319
- Building management/caretaker will take responsibility for the provision of bin servicing and transport as well as maintaining waste areas
- Storage is of adequate size to store the required number of bins
- Amenities are easily accessible to residents, but not for non-residents to discourage illegal dumping
- Ventilation complying with AS1668, with ventilation openings located close to ceiling and floor and away from windows of dwellings
- All lighting and electrical components will be built to comply with standards and building regulations

6.4 On-going Waste Management

The on-going management of waste on-site will be stipulated with conditions set out in the conditions presented to occupants before they use the facility. The building manager will be responsible for the transportation of the bins to and from the storage area for collection and clean the waste area at a regular interval of once a week.

Each unit will be supplied with two bins clear marked as “waste” and “recyclables” as part of the kitchen fit-out either under a bench or inside a cupboard for storage of a full day’s worth of household waste.

Signage and written information will be provided, so the occupants are aware of how to use and manage the waste and recycling services.

Appendix A – Signage used in waste storage areas