Consulting.™
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14-16 Marshall Avenue, 5-9 Holdsworth Avenue and 2-10 Berry Road, St Leonards

Residential Development

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

20/04/2023
Revision B

Client

Modern Construction & Development Pty Ltd.

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Architect

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SCOPE

A Waste Management Plan (WMP) is to be submitted with all development applications for new and change-of-use developments that will generate construction, demolition and operational waste.

This WMP applies only to the **construction** and **demolition** phases of the proposed development. The requirements outlined in this WMP must be implemented on site during construction and demolition and may be subject to review upon any change to the design. Construction and demolition waste management requirements will also be subject to review as part of the Construction Management Plan.

The waste management for the **operational** phase of the development is not addressed in this report. An operational WMP has been provided by Elephants Foot Consulting (EFC) in a separate document.

REVISION REFERENCE

Revision	Date	Prepared by	Description
A	17-04-2023	T. McPherson	Draft
B	20-04-2023	T. McPherson	Final

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1 INTRODUCTION

1.1 Background

EFC has been tasked to prepare the following waste management plan for the client Modern Construction & Development for the management of construction and demolition waste generated by the residential development located at 14-16 Marshall Avenue, 5-9 Holdsworth Avenue and 2-10 Berry Road, St Leonards NSW.

Waste management strategies and auditing are a requirement on construction sites to promote strong sustainability outcomes. It is EFC's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill, by implementing convenient and efficient waste management systems

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development

iii. ***Comply*** with all relevant Australian Standards, council codes, policies, and guidelines.

1.2 PROJECT OVERVIEW

This C&D Report has been prepared by T. McPherson on behalf of Modern Construction & Development **(Proponent)** and in support of a development application submitted to Lane Cove Council (**Council**) for construction of a mixed-use development comprising of 10 allotments with a total site area of 5,874sqm. The site is known as Areas 13,14 and 15 within the St Leonards South Precinct, and is bound by Marshall Avenue to the north, Holdsworth Avenue to the east and Berry Road to the west.

This development proposal seeks consent for the demolition of all existing buildings and structures on site and the construction of three separate 10 to 11 storeys residential flat buildings development, in accordance with the broader development within the St Leonards South Precinct.

More specifically, the proposed works are described as follows:

- Construction of three residential buildings comprising:
  - A consolidated basement car park comprising four levels and one part basement level;
  - Vehicular access via Holdsworth Avenue (from Area 14).
- Significant landscaping integrated throughout the site with a focus on the central green spine.

A key component of the development is to incorporate the desired future character of the St Leonards South Precinct and emphasis on the unique context of the locality through architectural expression and landscaping.

The proposed development is aligned with Council's vision for the St Leonards South Precinct and will create a landmark development within this corner site to celebrate the gateway entrance to the St Leonards South Precinct.

2.0 BACKGROUND

The site forms part of the Council led St Leonards South Planning Proposal followed by the amendments to the LEP, DCP and implementation of a new Landscape Master Plan (LMP). The intent of the amendments is to allow for higher density residential development in the area. The LEP amendments were gazetted in October 2020 and came into effect on 1 November 2020.

The new planning framework is also supported by a site specific DCP and a LMP which were adopted by Council on 19 October 2020. These documents are intended to supplement the LEP controls to provide more detailed built form and landscape guidelines.

3.0 PRELODGEMENT DISCUSSIONS

The proposal for the development of Area's 13, 14 & 15 has led to multiple preliminary discussions with Lane Cove Council. The Proponent has been consulting extensively with Lane Cove Council throughout the Planning Proposal phase, and in addition met with senior planning staff in November 2020 to seek clarity on a range of matters while the design review structure was being finalised.

Post gazettal of the LEP and as part of the pre-DA process, the applicant met with Council and the Design Excellence Panel (**DEP**) on multiple occasions. Preliminary design schemes were presented at these meetings.

On 19 August 2022, Lane Cove Council issued a Letter to the Applicant providing detailed comments on the proposal. The correspondence generally accepted the design responses with one amendment pertaining to the southern setback controls for Levels 5-10 of buildings in Areas 14 & 15.

4.0 SITE LOCATION

The subject site is located at 2-10 Berry Road, 5-9 Holdsworth Avenue and 14-16 Marshall Avenue, St Leonards. The site comprises 10 allotments with a total site area of 5,874sqm. It is acknowledged that the Proponent owns all lots forming part of the site.

The site is known as Areas 13, 14 and 15 within the St Leonards South Precinct and in the Lane Cove Local Government Area (LGA). St Leonards is located 6km north of the Sydney CBD. The subject site is in proximity and highly accessible to the commercial centres of North Sydney, Chatswood and Macquarie Park. The site is located within convenient walking distance to St Leonards rail station and the future metro station.

The surrounding development has undergone significant transition, from low density dwellings to medium and high density residential and mixed use. The desired future character for St Leonards South Precinct is for a liveable, walkable, connected, safe area which helps build upon the transit, commercial and residential opportunities of St Leonards. This transition is being supported by current development activity, recent approvals and further planned development.

Address	Lot and Deposited Plan
14 Marshall Avenue	Lot 2 in DP7259
16 Marshall Avenue	Lot 1 in DP7259
2 Berry Road	Lot 38 in DP7259
4 Berry Road	Lot 37 in DP7259
6 Berry Road	Lot 36 in DP7259
8 Berry Road (*to be acquired from neighbour)	Lot 35 in DP7259
10 Berry Road (*to be acquired from neighbour)	Lot 34 in DP7259
5 Holdsworth Avenue	Lot 7 in DP7259
7 Holdsworth Avenue	Lot 8 in DP7259
9 Holdsworth Avenue	Lot 9 in DP7259

Figure 1: Site Location

(Source: Six Maps).

Figure 2: Proposed St Leonards Masterplan Aerial View.

(Source: A+ Design, 2020).

4.1 Legislation and Guidance

Information provided in this WMP comes from a wide range of construction and demolition waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Lane Cove Council Local Development Plan 2010
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide – Recycling and Re-use Across the Supply Chain*. (2014, November).
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

4.2 Waste Diversion Targets

To quantify and measure this sustainable approach to waste management, the NSW WARR Strategy 2014-2021 outlines specific targets in order to clarify the state's long-term goals and priorities. These targets were supported by industry, community, state, and local governments during the Strategy's consultation phase, and include:

- Increasing construction and demolition recycling rates to 80%
- Increasing waste diverted from landfill to 75%
- Reducing litter by 40%
- Reduce illegal dumping incidents by 30%

4.3 Report Objectives

Throughout this report, EFC aims to encourage where practical, having regard to the design, the nature of the material to be demolished and the site constraints, the following waste management practices for the duration of the demolition and construction stages of the development:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used on-site as appropriate, or recycled off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard waste returned to supplier for recycling;
- Framing timber re-used on site or recycled off-site;
- Windows, doors and joinery recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Plumbing, fittings and metal elements recycled off site;
- Ordering accurate quantities of materials and prefabrication of materials where possible;
- Re-use of formwork;
- Careful source separation of off-cuts to facilitate re-use, resale or recycling.

4.4 Limitations

This report has been prepared by EFC for the sole purpose of providing a Construction and Demolition Waste Management Plan (C&D WMP) to support a development application. The report is provided with the following limitations:

- This report is for the sole use of 14-16 Marshall Avenue, 5-9 Holdsworth Avenue and 2-10 Berry Road, St Leonards NSW (including their officers, employees and advisers) and should not be used or relied upon by any other party without prior written consent from EFC;

- Drawings, estimates and information contained in this report have been prepared by analysing information, plans and documents supplied by the client, or nominated third parties. Any assumptions based on the information contained in the report are outside the control of EFC;

- The calculations presented in the report are estimates only. The amount of waste generated will be dependent on the approach taken by site management, including the levels of training and education offered to site staff and the actions and attitudes of staff themselves.

- The site manager will make adjustments as required based on actual waste volumes (e.g., if waste volumes are greater than estimated, then waste storage capacity and collection frequencies will increase accordingly) and increase the amount of waste storage and collection frequency accordingly;

- The report has been prepared with all due care and attention; however, no assurance or representation is made that the WMP reflects the actual outcome. EFC will not be liable to for any plans or outcomes that are not suitable for purpose, whether as a result of incorrect or unsuitable information or otherwise;

- EFC offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;

- Examples of equipment provided in this report should be reviewed by the appropriate equipment supplier who will assess the correct equipment for supply. Reference to any other business or product besides EFC and EFC equipment is for information purposes only, and is not officially endorsed or recommended by EFC.

5.0 GENERAL WASTE MANAGEMENT PROVISIONS

5.1 Stakeholder Roles and Responsibilities

All stakeholders have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Contractor will be responsible for implementing this WMP, although site staff have a responsibility to ensure their own compliance at all times. Where possible, an Environmental Management Representative (EMR) should also be appointed for the project to help ensure compliance. The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Construction Site Management	• Organise waste collections as required; • Organise replacement or maintenance requirements for bins; • Investigate and ensure prompt clean-up of illegally dumped waste materials; • Notify the Principal Certifying Authority (Council) of the appointment of waste removal, transport or disposal contractors for waste tracking purposes; • Ensure waste related equipment is well maintained; • Ensue accurate calculations so only the required amount of materials are ordered; • Ensure segregation of materials to maximise reuse and recycling; • Check waste sorting and storage areas routinely for cleanliness, hygiene, contamination and OH&S issues; • Ensure all monitoring and audit results are well documented and are carried out as specified in the WMP; • Ensure effective signage, communication and education is provided to site staff/contractors; • Provide staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers;
Site Staff/Contractors	• Ensure adequate separation and disposal of waste streams in compliance with the WMP; • Abide by all relevant OH&S legislation, regulations, and guidelines; • Attend training and inductions as required; • Clean and transport bins as required; • Carry out daily visual inspections of waste storage areas; • Organise, maintain and clean the waste storage areas;
Environmental Management Representative (EMR)	• Approach and establish the local commercial reuse of materials where reuse on-site is not practical; • Establish separate skips and recycling bins for effective waste segregation and recycling purposes; • Ensure staff and contractors are aware of site requirements; • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the development; • Contaminated waste management and approval of off-site waste transport, disposal locations and check licensing requirements; • Arrange assessment of suspicious potentially contaminated materials, hazardous materials and liquid waste; • Monitor, inspect and report requirements.
Waste Collection Contractors	• Provide a reliable and appropriate waste collection service; • Provide feedback to construction site management regarding contamination of waste streams; • Work with construction site management to customise waste systems where possible.

5.2 Monitoring and Reporting

It is recommended that the following measures be taken to improve demolition and construction waste management in future and to provide more reliable waste generation figures:

- Compare projected waste quantities with actual waste quantities produced.
- Conduct waste audits of current projects (where feasible).
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council or the EPA if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training should be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and should include the contact details of the 24-hour EPA Pollution line. Likely incidents to occur during the construction and demolition stage of the development may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

5.3 Opportunities for Reuse and Recycling

There are many opportunities to reduce the volume of waste generated during demolition and construction. Adaptive reuse of building materials should be encouraged, with significant consideration given to methods of reusing or recycling materials onsite as well as sourcing used or recycled materials from elsewhere to be used on site.

The site should facilitate where practical reuse and recycling by 'deconstruction', whereby various materials are carefully dismantled and sorted. Any unwanted reusable materials can be taken to a second-hand building centre, reducing waste disposal costs.

Materials that are individually wrapped should also be avoided where possible, with preference given for materials that can be delivered in returnable packaging such as timber pallets.

The table below gives examples of potential reuse and recycling options for the materials likely to be used/generated in construction and demolition at this development:

Table 2: Potential Reuse/Recycling Options for Construction Materials

Material	Reuse/Recycling Potential
Asphalt	Hot in-place recycling or reprocessed into Reclaimed Asphalt Pavement (RAP).
Bricks	Cleaned and/or rendered for reuse, crushed for fill, sold or provided to a recycled materials yard
Cardboard Packaging	Recycled at a paper/cardboard recycling facility
Carpet	Cleaned and reused for the same purpose, reused in landscaping or garages/sheds, recycled at an appropriate processing facility
Concrete, Masonry, Spoil	Reused on-site as fill, levelling or crushed for road base
Doors, Windows, Fittings	Reused in new or existing buildings or sent to second-hand supplier
Glass	Recycled at a glass recycling facility, aggregate for concrete production, crushed for termite barrier, reused as glazing
Green Waste (Organics)	Mulched, composted for reuse, trees chipped for use in landscaping or removed carefully and reused onsite or sold
Hardwood Beams	Reused as floorboards, fencing, furniture or sent to second-hand timber supplier
Insulation Material	Reprocessed to remove impurities and reused for the same purpose or as off-cuts, compressed for ceiling tile manufacture
Metal, Steel/Copper Pipe	Recycled at a metal recycling facility, melted into secondary materials for structural steel, roofing, piping etc. copper sold for re-use
Other Timber	Reused in formwork, ground into mulch for garden or sent to second-hand timber supplier
Plasterboard	Crushed for reuse in manufacture of new plasterboard, returned to supplier or used in landscaping
Plastics	Reused as secondary materials for playgrounds, park benches etc.
Roof Tiles	Cleaned and reused, crushed for reuse for landscaping and driveways or sold or provided to a recycled materials yard
Soil	Stockpiled onsite for reuse as fill
Synthetic & Recycled Rubber	Reused for the same purpose or reprocessed for use in manufacture/construction of safety barriers, speed humps
Topsoil	Stockpiled onsite for reuse in landscaped areas

5.4 Management of Hazardous Waste Materials

For the purpose of this report, hazardous waste materials include any waste that poses a hazard or potential harm to human health or the environment, particularly asbestos waste and asbestos containing material (ACM). The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

During the construction phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g., asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Site Manager is to stop work immediately in that location and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

5.5 Management of Asbestos

Airborne asbestos is a health hazard. Illegal dumping of asbestos may lead to increased exposure to asbestos fibers. As a result, the movement of asbestos must be monitored to ensure it does not harm the environment or human health.
During the demolition phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

NSW
Removal must be by a professional licensed by SafeWork NSW. Asbestos waste must be tracked when transported from its place of generation to its final destination. WasteLocate is NSW EPA's online system for tracking asbestos waste within NSW.

Under clause 79 of the *Protection of the Environment Operations (Waste) Regulation 2014*, waste operators, transporters, and waste and recycling facilities must use WasteLocate when consigning, transporting or accepting more than 100kg of asbestos waste, or more than 10 square metres of waste asbestos sheeting, in any single load.

For more information, visit www.asbestos.nsw.gov.au
Technical Support – Amtac Professional Services – 1800 420 380 or WasteLocate@QR2id.com

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Site Manager is to stop work immediately in that location and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

5.6 Management of Excavation Waste

For the purpose of this report, excavation waste consists of any unwanted material generated from excavation activities such as a reduced level dig, site preparation and levelling and the excavation of foundations, basements, tunnels and service trenches. This will typically consist of soil and rock. The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

All excavated material generated on this site may be re-used in the landscaping or used on other sites as fill material, provided no contamination is present. If sandstone is found to be present, this may be sold or incorporated into the building design.

The following measures and safeguards will apply to the development for excavated material:

- Wherever practical, excavation material will be reused as part of the development;
- Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot;
- A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes;
- Transportation routes for excavation material removed from site will be identified and used.

6.0 SITE SPECIFIC WASTE MANAGEMENT PROVISIONS

6.1 Demolition Waste Volumes and Management

The demolition stage of the development provides the greatest opportunity for waste minimisation and resource recovery. The first thing that should be considered is whether it is possible to reuse existing buildings or parts of buildings for the proposed use. With careful on-site sorting and storage and by staging work programs it is possible to reuse many materials, either on or off-site.

The existing buildings at this site will be demolished and new buildings will be constructed. Where possible, materials will be reused, such as crushing concrete for use as clean fill. However, the majority of the components of the building will either be reused for the same purpose or disposed of offsite.

A demolition contractor will be engaged during this phase of the project. The contractor will be responsible for ensuring all demolition activities are planned and undertaken in accordance with relevant waste minimisation policies and DA requirements.

The table below illustrates the anticipated volumes of materials generated at this development during the demolition stage. Volumes have been advised by our client.

Table 3: Demolition Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Excavation Material	44,466	44466	99.8%
Green waste	32400	4860	80%
Bricks	265	318	100%
Tiles	117	117	100%
Concrete	446	669	100%
Timber	445	84.55	33%
Plasterboard	359	71.8	50%
Metals	315	157.5	100%
Asbestos	7	2.17	0%
Other waste	52	15.6	0%
Totals	**78,872**	**50,761.62**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled demolition waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the demolition materials will be managed, and estimates percentage of materials diverted from landfill.

Table 4: Demolition Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	44466	☒	☒	☐	44354.8
Green Waste	☐	4860	☐	☒	☒	3888.0
Bricks	☐	318	☒	☒	☐	318.0
Tiles	☐	117	☒	☒	☐	117.0
Concrete	☐	669	☒	☒	☐	669.0
Timber	☐	84.55	☐	☒	☒	27.9
Plasterboard	☐	71.8	☒	☒	☒	35.9
Metals	☐	157.5	☐	☒	☐	157.5
Asbestos	☐	2.17	☐	☐	☒	0.0
Other Waste	☐	15.6	☒	☒	☒	4.7
	Total	**50,761.62**			**Total**	49,572.8
					Total Diversion of Waste from Landfill (Minimum 80%)	**97.7%**

6.2 CONSTRUCTION WASTE VOLUMES AND MANAGEMENT

Waste generated during the construction stage of the development will be managed by the principal contractor and sub-contractors, with materials being reused and recycled wherever possible. Where neither reuse nor recycling are possible, waste will be disposed of as general waste at a licensed landfill site.

Recyclable material generated during construction will largely consist of off-cuts and discarded bricks, timber, steel, concrete, tiles, plasterboard, and piping, as well as packaging materials.

It is important to note that source separation of waste on-site may offer cost savings when compared to the disposal of mixed waste at landfill sites. Further cost savings may be achieved through the use of reusable and recycled-content materials and by reusing materials salvaged from the demolition stage of the development.

The table below illustrates the anticipated volumes of materials generated at this development during the construction stage. Volumes have been advised by our client.

Table 5: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Approx. Percentage Recovered
Excavation Material	N/A	N/A	99.8%
Green waste	N/A	N/A	80%
Bricks	96.4	115.7	100%
Tiles	11.55	11.6	100%
Concrete	630.2	945.3	100%
Timber	11.83	2.2	33%
Plasterboard	157.6	31.5	50%
Metals	2	1	100%
Other waste	N/A	N/A	0%
Totals	**909.58**	**1107.3**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the construction materials will be managed, and estimates percentage of materials diverted from landfill.

Table 6: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Bricks	☐	115.7	☒	☒	☐	115.7
Tiles	☐	11.6	☒	☒	☐	11.6
Concrete	☐	945.3	☐	☒	☐	945.3
Timber	☒	2.2	☐	☒	☒	0.7
Plasterboard	☐	31.5	☐	☒	☒	15.8
Metals	☒	1	☐	☒	☐	**1**
	Total	**1107.3**			**Total**	**1090**
					Total Diversion of Waste from Landfill (Minimum 80%)	**98.4%**

6.3 Recycling Directory

Construction and demolition materials removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* and disposal at facilities appropriately licensed to receive the particular materials.

Please find the below recommendations for recycling drop off locations for all materials likely to be generated at this development. Only the nearest locations are provided. See www.businessrecycling.com.au for additional locations:

	Business Name	Suburb	Distance (km)
Excavation Material	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Green waste	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Bricks	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Tiles	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Concrete	SUEZ Resource Recovery Centre	North Ryde	4.4
	AE Biggs	Oxford Falls	9.1
	Kimbriki Resource Recovery Centre	Ingleside	12.6
Timber	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Plasterboard	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4
Metals	SMS Municipal Services	Brookvale	1.4
	BINGO Recycling Centre	Artarmon	2.1
	SUEZ Resource Recovery Centre	North Ryde	4.4

6.4 Site-Specific Operational Measures

Training/Site Inductions

All staff employed during the demolition and construction stages of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.

Induction training will include the following at a minimum:

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- The implications of poor waste management practices;
- Correct use of general-purpose spill kits;
- Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

Materials Selection and Ordering

- Selection of all materials will be undertaken by architectural designers;
- Prefabrication of materials off-site where possible;
- Materials requirements are to be accurately calculated to minimise waste from over-ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.

Waste Avoidance Opportunities

- Limiting unnecessary excavation;
- Selection of construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork;
- Planned work staging;
- Use of naturally ventilating buildings to reduce ductwork;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
- Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Reduction of PVC use;
- Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- Use of fittings and furnishings that have been recycled or incorporate recycled materials;
- Use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Site Procedures

- Excavated materials will be used onsite where practical;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;
- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

6.5 Location and Design of Waste Management Facilities

General Requirements

All waste management facilities onsite should:

- Be conveniently located to enable easy access for on-site movement and collection;
- Be incorporated with other loading/unloading facilities;
- Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;
- Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;
- Have adequate weather protection and, where required, be enclosed or undercover;
- Be secure and lockable;
- Be well-ventilated and drained to the sewer;
- Be clearly sign-marked to ensure appropriate use.

Waste and Recycling Receptacles

A sufficient quantity of skip bins should be provided for the separate storage of each type of C&D material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.

The size of the receptacles should be appropriate to the nature of waste generated and the available storage area. In general, the following options would be acceptable:

Bin Size	Access	Dimensions
2.5m	Top loading	
3m	Drop door walk-in	
4m	Drop door walk-in	
5m	Drop door walk-in	
6m	Double doors walk-in	

Source: Aussie Bins

If the developer chooses to adopt a traditional waste management strategy, whereby waste is deposited into comingled skip bins to be sorted offsite, a single skip bin would be considered sufficient for purpose. However, if the site is to pursue source separation, dedicated skips for the following materials are recommended:

- Timber;
- Plasterboard;
- Concrete;
- Bricks;
- Scrap metal;
- General waste.

Separate receptacles for the safe disposal of hazardous waste types (i.e. light bulbs, batteries, etc) will also be provided where applicable. Where possible, additional bins will be provided in common areas for the collection of commingled recyclables such as beverage containers (glass, plastic, aluminium), paper products, recyclables food containers, etc. Specialised bins for cigarette butts should also be provided.

Safety and Signage

The following safety measures should be considered for the waste storage area:

- Location should not interfere with sight lines of drivers entering or leaving the site;
- Skip bins should be clearly visible and located in well-lit areas;
- Safe paths of travel should be designated using reflective tape, barriers and cones;
- Skip bins must be secured and must not be over-filled to reduce risk of injury through bins moving and falling objects.

Standard signage will be installed in all waste areas, with all skip bins colour coded and labelled appropriately on all sides to allow clear identification of the type of waste to be deposited into each bin.

Refer to the EPA's website for standard construction waste and recycling signs:

www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Space and Siting Requirements

The waste storage area will be located adjacent to the entrance to the site to enable access and allow sufficient space for the required skip bins and servicing requirements. The storage area will also be flexible in order to cater for change of use throughout demolition and construction works.

Where space is restricted, dedicated stockpile areas will be allocated onsite, with regular transfers to the dedicated skip bins for sorting and collections.

The position of the designated waste holding area onsite may change according to building works and the progression of the development. Access, visual amenity and WHS will always be integral to the selection of waste storage area locations. Any stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

Servicing and Transport

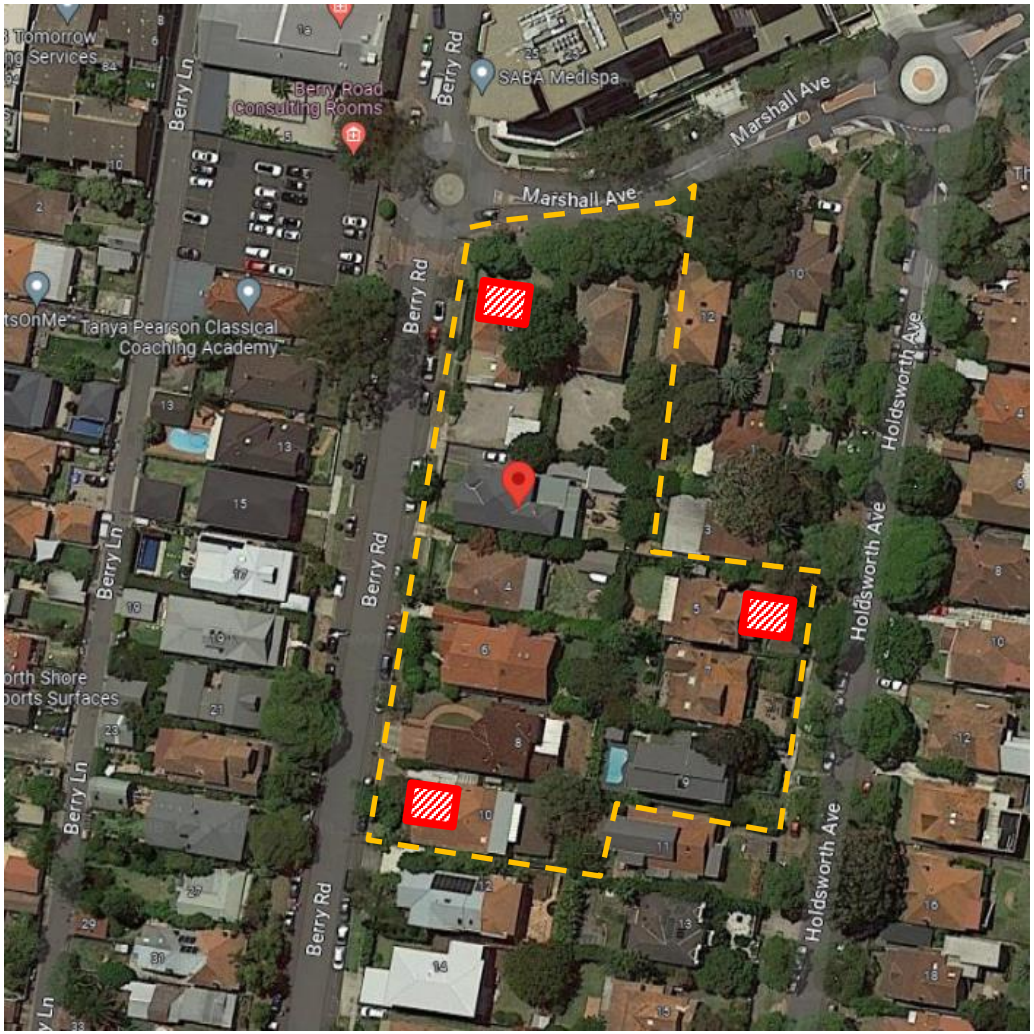
The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Construction Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should be organised for within 24 hours.

All skip bins leaving the site will be covered with a suitable tarpaulin to reduce spillage of waste while in transit.

All waste collection for construction works will be conducted between approved hours as per Council requirements (typically between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays). All waste generated on site will be transported to an approved and appropriately licensed resource recovery facility and/or landfill site.

6.6 Architectural Plans

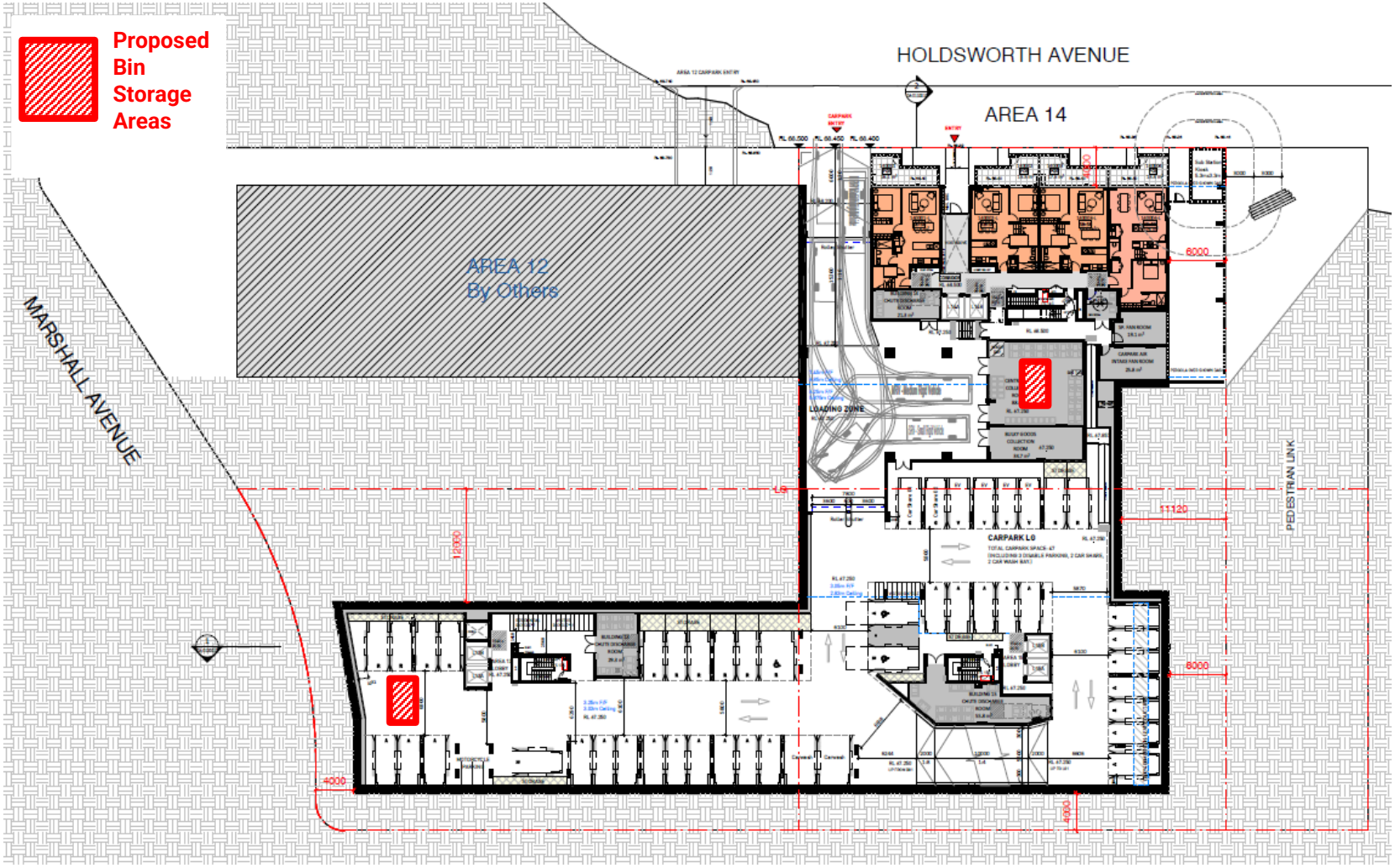
Existing Structures – Site Location.



Proposed Bin Storage Areas

Source: Google Maps.

Proposal



Source: PTW Architects, Drawing no. DA-B1GRD10, Revision H (March 2023), Ground Floor Plan.