Lots 155 and 177 Anambah Road, Maitland – Waste Management Plan

A Submission to Thirdi Communities

15th January 2025

MRA Consulting Group

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Disclaimer

In the spirit of reconciliation MRA Consulting Group acknowledges the Traditional Custodians of Country throughout Australia and their connection to land, sea and community. We pay our respects to Aboriginal and Torres Strait Islander peoples and to Elders past, present and emerging.

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Glossary

Terminology	Definition
AS	Australian Standard
C&D	Construction and Demolition
C&I	Commercial and Industrial
DA	Development Application
DCP	Development Control Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
ILU	Independent Living Unit
LGA	Local Government Area
MGB	Mobile Garbage Bin
MRA	MRA Consulting Group
MSW	Municipal Solid Waste
MLEP	Maitland Local Environmental Plan 2011
MDCP	Maitland Development Control Plan 2011
VENM	Virgin Excavated Natural Material
WMP	Waste Management Plan
WSP	Waste Service Provider
WSRA	Waste Storage and Recycling Area

1 Introduction

MRA Consulting Group (MRA) was engaged by Thirdi Communities to prepare a Waste Management Plan (WMP) related to the proposed Manufactured Housing Estate (MHE) development located at 559 Anambah Road, Gosforth NSW. The site is located within the Maitland Local Government Area (LGA).

The proposed development includes:

- Land clearing and demolition works associated with preparation of the site.
- Construction of a MHE development inclusive of approximately 332 manufactured home sites. It is noted that the installation of the manufactured homes will be subject to a separate application.

This WMP addresses the requirements of the Consent Authority (Council) and conforms to the following environmental planning instruments and reference documents:

- Maitland Development Control Plan 2011 (MDCP)
- Maitland Local Environmental Plan 2011 (MLEP)

Consideration has also been given to the following supplementary documents in the preparation of the WMP:

- NSW EPA (2019) *Better Practice Guide for Resource Recovery in Residential Developments.*

A Waste and Recycling Management Plan has been prepared in accordance with (DCP), and states the following objectives for waste management:

1. To minimise resource requirements and construction waste through reuse and recycling and the efficient selection and use of resources.
2. To encourage building designs, construction and demolition techniques in general which minimise waste generation.
3. To assist applicants in planning for sustainable waste management, through the preparation of a site waste minimisation and management plan. This plan is to be completed in the planning stages of a development.
4. To facilitate effective waste minimisation and management for development in a manner consistent with the principles of ESD.

This WMP is used to inform the building design to deliver best practice waste management and promote sustainable outcomes at the demolition, construction and operational phases of the development. The WMP addresses waste generation and storage associated with demolition and construction works through redevelopment, and ongoing occupation of the proposed use.

2 Background

2.1 Description of the Proposed Development

The proposed development site is located at 559 Anambah Road, Gosforth NSW and is legally identified as Lot 177 DP874171 and Lot 55 DP874170 (see Figure 1).

Figure 1: Site and surrounding area

Source: Six Maps.

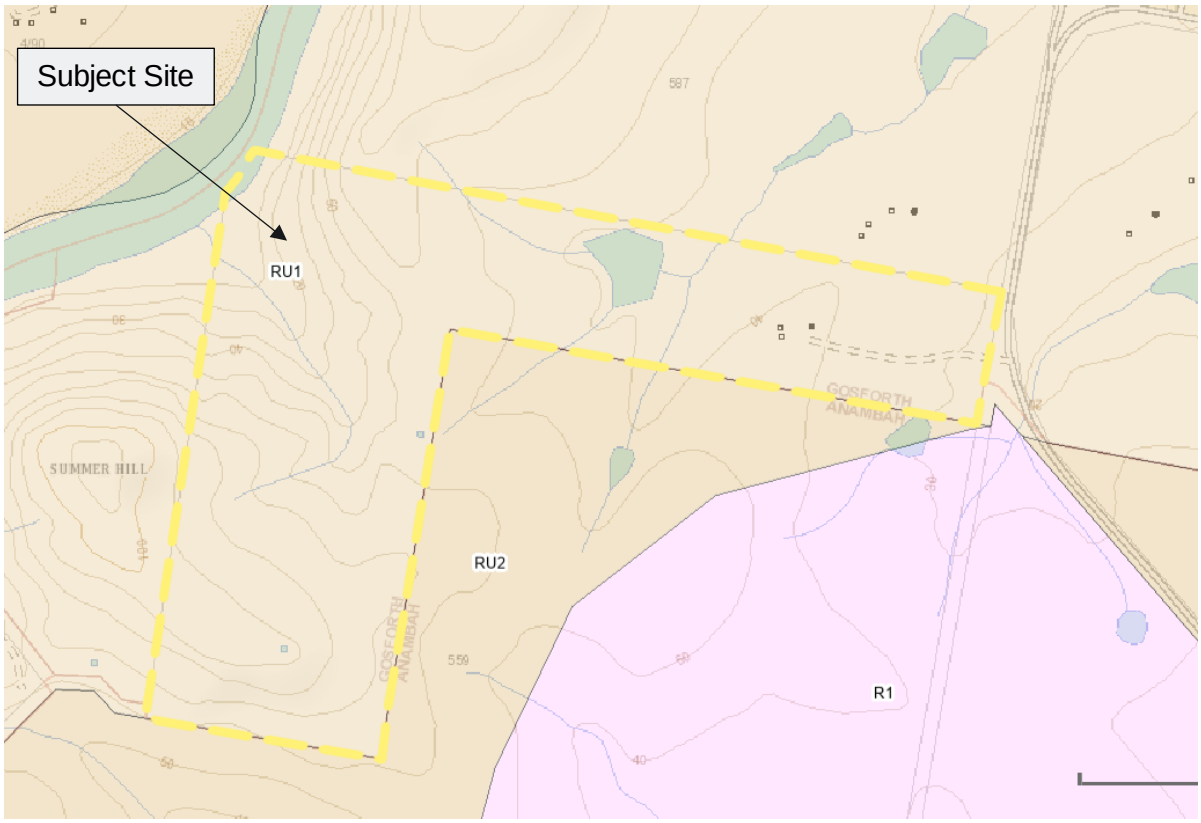
2.2 Zoning and Use

The site is zoned as R1 - General Residential and RU2 – Rural Landscape according to the MLEP 2011. The objectives of this zones are –

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To maintain the rural landscape character of the land.
- To provide for a range of compatible land uses, including extensive agriculture.

- To provide for a range of non-agricultural uses where infrastructure is adequate to support the uses and conflict between different land uses is minimised.

Figure 2: Land use zone map



Source: eSpatial Viewer, 2024.

2.3 Strategies

Waste management for the site considers better practice, necessary equipment, and integration with other guidance documents including the NSW Waste and Sustainable Materials Strategy (NSW EPA, 2021), and National Waste Policy: Less Waste, More Resources (DAWE, 2018). The key policy aims that are considered are:

- Avoidance (to prevent the generation of waste);
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource; and
- Ensure that waste treatment, disposal, recovery and re-use are undertaken in a safe, scientific and environmentally sound manner.

Management of waste generated onsite according to directives of the NSW Strategy will assist in achieving the target of 80% diversion from landfill in the C&D sector.

2.4 Assumptions

This report is a Waste Management Plan (WMP), forming part of the development documentation and assumes:

- Drawings and information that have been used in waste management planning for this WMP are the final design set for the development plan from the project architect, Moir Studio, dated 13/12/2024;
- Waste and recycling volumes are based on information provided from the MDCP 2011; and
- This WMP is a living document and therefore, waste management equipment and systems described in this report are subject to change based on future operations and available technology.

3 Construction and Demolition

Demolition and construction activities at the site will generate a range of construction and demolition (C&D) waste. Throughout the development process, all materials will be reused and recycled where possible, minimising the disposal (landfilling) of materials other than those that are contaminated or unsuitable for reuse or recycling processes.

Waste storage during construction operations will involve some stockpiling of reusable material, as well as placement of wheeled bins for the separation of construction materials for recycling. A bin for residual waste or contaminated material will also be made available at the site for disposal where necessary. Bins may require alternative placement across construction operations to facilitate the safe and efficient storage of materials and will be retained within property boundaries to avoid illegal dumping.

A waste storage area shall be designated by the demolition or construction contractor and shall be sufficient to store the various waste streams expected during operations. Waste storage areas will be kept clear to maintain access and shall also be kept tidy to encourage separation of waste materials and for WHS reasons. The waste storage area will retain multiple bins to allow for source separation of waste to allow for ease of recovery and reuse of materials.

Waste management principles, management measures and facilities in use on the site shall be included as part of the site induction for all personnel working on the site.

3.1 Demolition Waste

The proposed development will require demolition of existing structures prior to commencement of excavation and construction operations. Demolition works are minor and include the removal of some feed troughs, paddock fence posts and wire.

The MDCP 2011 states the following objectives for demolition as they relate to waste management:

a) An area shall be allocated for the storage of materials for use, recycling and disposal, giving consideration to slope, drainage, location of waterways, stormwater outlets, vegetation and access and handling requirements.

b) Waste and recycling materials are to be separated.

c) Measures are to be implemented to prevent damage, minimise health and order risks, and windborne litter.

Table 1 outlines the expected demolition waste quantities to be generated at the site, in addition to the appropriate management methods for each material type. Other materials with limited reuse potential either on or offsite will be removed in bulk bins for recycling at an appropriately licenced and capable recycling facility.

Table 1: Demolition waste generation estimates

Type of Material	Estimated volumes (m^3) or unit	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Disposal	Estimated % Landfill	Estimated % of landfill diversion	Methods for re-use, recycling or disposal
Timber (Clean)	10 - 15	✓	✓	✓	-	0	100	Onsite: To be separated wherever possible to enhance resource recovery. Offsite: Removed to C&D facility for crushing and recycling for recovered products.
Metals (ferrous & non-ferrous)	<5	-	✓	✓	-	<10%	>90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Removed to C&D facility for recovery and recycling.
Vegetation	Minor	✓	✓	✓	-	0	100	See site demo/vegetation removal plan. Onsite: To be separated wherever possible to enhance resource recovery or shredded for use onsite as mulch in landscaping. Offsite: Removed to C&D facility for crushing and recycling for recovered products.
Residual waste	Minor	-	-	-	✓	100%	-	Resource recovery dependant on facility destination capability.
Total % Diversion from Landfill Estimated							**>80%**	

3.2 Construction Waste

The proposed development involves the construction of a MHE (332 homes) and community facilities inclusive of a:

- Clubhouse,
- secondary community hub,
- half lawn bowling green,
- pool,
- tennis court,
- pickleball court,
- maintenance shed,
- mens shed,
- dog exercise area,
- perimeter paths, and
- community garden.

Table 2 outlines indicative volume to weight conversion factors for common construction materials.

Table 2: Indicative volume to weight conversion factors for common construction materials

Building waste material	Tones per m^3	Waste as % of the total material ordered
Soil/aggregate	1.4 – 1.6	–
Bricks	1.2	5–10%
Concrete	1.5	3–5%
Tiles/ceramics	0.5 – 1	2–5%
Timber	0.3	5–7%
Plasterboard	0.2	5–20%
Metals	0.15 – 0.9	–

Source: Green Building Code of Australia C&D Waste Criteria.

Table 3 outlines the estimated waste generation rates for materials through construction of the proposed development, in addition to the appropriate management methods for each material type.

The information below presents multiple options for materials reuse, recycling and disposal where applicable (e.g. return to manufacturer, recycled at construction and demolition (C&D) processor, or disposed to landfill if contaminated).

Table 3: Construction waste generation estimations

Type of Material	Estimated Volumes (m^3)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Excavated material	40,000	✓	✓	✓	<5%	>95%	Onsite: Reuse for fill and levelling per site cut and fill plan in Stage 1 and future stage stockpiling. Offsite: Not expected that there will be overburden which cannot otherwise be utilised for fill in future stages of development. Disposal: Removal of any contaminated material for appropriate treatment or disposal.
Bricks/pavers	25-50	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.
Concrete/ Asphalt	500-1,000	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for filling, levelling or road base. Offsite: Removed to C&D facility for crushing and recycling for recovered products.
Tiles	<20	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.

Type of Material	Estimated Volumes (m^3)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Timber (clean)	<30	-	✓	✓	<10%	>90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse removed to C&D facility for recovery where possible.
Timber (treated)	<30	-	✓	✓	50%	50%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse removed to C&D facility for recovery where possible.
Plasterboard	<20	-	✓	✓	<10%	90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier or removed to a C&D/plasterboard recovery facility for recovery where possible.
Glass	<10	✓	✓	✓	<10%	>90%	Onsite: Separated wherever possible and reused or crushed for landscaping and driveways. Offsite: Returned to supplier for reuse or removed to C&D facility for crushing and recycling for recovered products.
Metals (ferrous) Metals (non-ferrous)	<20	-	✓	✓	<10%	>90%	Onsite: Separated wherever possible to improve resource recovery. Offsite: Returned to supplier for reuse or removed to C&D facility for recovery and recycling.

Type of Material	Estimated Volumes (m^3)	Re-use on-site	Recycle (Separate collection)	Recycle (Off-site)	Landfill	% of landfill diversion	Methods for re-use, recycling or disposal
Floor covering	<20	✓	✓	✓	<10%	>90%	On site: to be separated wherever possible to enhance resource recovery. Reuse: surplus and offcut material returned to manufacturer for reuse where possible. C&D processor: recovery and recycling.
Residual waste	50-100	-	✓	✓	100%	-	Resource recovery dependant on facility destination capability.
Total % Diversion from Landfill Estimated						**>90%**	

3.3 Waste Contractors and Facilities

To ensure best practice waste management, appropriate contractors and facilities have been proposed based on their location and service offerings (Table 4).

Table 4: Waste service contractors and facilities

Role	Details
Recommended Waste Collection Contractor	The following are local skip bin operators for consideration in the management of excavation and construction waste for the site: • Big Rat Skips Maitland; • JR Richards & Sons; • Central Skips; Or another supplier as elected by the building contractor.
Principal Off-Site Recycler	The following are local C&D processing facilities for consideration in the management of C&D waste generated at the site: • Veolia Raymond Terrace Resource and Recovery Park; • Maitland Resource Recovery Centre; • JJ's Waste and Recycling; Or another appropriate facility as elected by the waste management contractor.
Principal Licensed Landfill Site	• Maitland Resource Recovery Centre. Or other appropriate facility as elected by the waste management contractor.

3.4 Site Documentation

This WMP will be retained on-site during the construction phases of the development, along with other waste management documentation (e.g. contracts with waste service providers).

Responsibility for the WMP, waste documentation and processes during the excavation and construction phases will be with the site manager or builder.

A logbook that records waste management and collection will be maintained on site, with entries including:

- Time and date of collections;
- Description of waste and quantity;
- Waste/processing facility that will receive the waste; and
- Vehicle registration and company name.

Waste management documentation, the logbook and associated dockets and receipts must be made available for inspection by an authorised Council Officer at any time during site works.

3.5 Waste Storage, Handling, Transport, and Disposal

3.5.1 Storage

Considering the nature of proposed works, waste management infrastructure should include retention of several skip bins (equivalent to marrel or RORO) for the storage of separated demolition and excavation material. Waste should be placed in designated bins and collected on a regular schedule, as bins become full.

Recyclable materials would be source-separated onsite where possible in labelled bins according to the type of material e.g. masonry, metals, paper and plastics, etc, to enable improved recovery rates.

All problem and hazardous wastes would be stored in separate areas or bins as they may require special treatment. Asbestos must be stored in a separate container and wrapped in thick plastic. Any flammable liquids would be stored in a bund; however this is not likely to be necessary at the site.

Separate site Mobile Garbage Bins (MGBs) would be retained on site to collect general waste and recycling associated with use of the site by demolition personnel.

3.5.2 Handling

The handling of waste would be dependent on waste type.

- Inert waste would be collected for recycling or disposal, as appropriate.
- Any soils that are tested and deemed to be contaminated would be contained in reference to the Remediation Action Plan sent to an appropriate facility for management and disposal.
- Soils determined to contain volatile organic compounds may be remediated on site through piling and aeration over time.
- VENM and ENM may be reapplied to land onsite. VENM may be applied to land offsite without a resource recovery order and exemption. ENM requires a resource recovery order and exemption to be applied to land offsite.
- Asbestos can only be disposed of to landfills which are licensed to receive it. It must be handled and transported in a specific manner as outlined in the management measures below.
- Problem wastes include tyres, paint, car batteries, gas bottles, oils and chemicals would be disposed of at facilities which are able to receive these materials.

The Business Recycling website businessrecycling.com.au provides a directory of locations where wastes can be recycled or safely disposed of.

All material generated would be separated where possible, to maximise resource recovery potential and reduce the need for disposal of residual materials to landfill. Any material deemed unsuitable for reuse or recovery would be disposed of to an appropriately licensed landfill. Reuse and recovery potential for expected waste product includes (but is not limited to) the methods outlined in Table 5.

3.5.3 Recycling of Materials

Table 5: Expected waste streams during demolition activities related to preliminary infrastructure works

Waste Material	Reuse or recovery Potential
Brick, Rubble, Stone, Ceramic, Tile, etc.	Sent to C&D processing facility for crushing and reuse as fill material.
Virgin Excavated Natural Material	Reuse as fill material.
Excavated Natural Material	Reuse as fill material. Compliance with ENM order and exemption is required for offsite application.
Timber (treated and non-treated)	Sent to organics processor or C&D processing facility for mulching for reuse.
Metals (ferrous & non-ferrous)	Fixtures and fittings returned to manufacturer for reuse (if applicable) or recycling at materials recycling facility.
Plastic	Recycling at materials recycling facility.
Paper & cardboard	Recycling at materials recycling facility.

Waste Material	Reuse or recovery Potential
Eligible residual or non-recoverable material	Processing at appropriately licensed energy from waste (EfW) as technology becomes readily available.
Tyres	Recycling at a tyre reprocessor.
Asbestos	Disposal at a facility licensed to receive asbestos.
Hazardous and problem waste streams	Disposal/recycling at a facility which is able to accept the particular type of waste.

3.5.4 Transport

Section 143 of the *Protection of the Environment Operations Act 1997* requires that waste is transported to a place that can lawfully accept it. Both the owner of the waste and the transporter are legally responsible for proving the waste was transported to a lawful place.

To show that waste has been lawfully disposed of records should be kept of the following:

1. All demolition waste dockets must be kept which show which facility received the material for recycling or disposal.
2. Who transported the waste (company name, ABN, vehicle registration and driver details, date and time of transport, description of waste)
3. Copies of waste dockets/receipts from the waste facility (date and time of delivery, name and address of the facility, its ABN, contact person).
4. Transport of waste materials is managed by a licensed operator.

Audits may be conducted by Council to verify that dockets have been kept and waste recycled and disposed of as described within the Waste Management Plan.

3.5.5 Disposal

The disposal of waste is recommended after recycling options have been implemented. Materials may only be disposed of materials to a facility which is licensed to take the particular type of waste.

1. The majority of waste onsite is inert, dry, non-putrescible waste which may be taken to any licensed landfill.
2. Stabilised asbestos in a bonded matrix may be taken to an inert waste Class 1 landfill or a solid waste landfill class 1 or 2.
3. The Planet Ark Business Recycling directory or “Recycling Near You” websites can be consulted to find facilities that accepts a particular type of waste for recycling or disposal.
4. The EPA website “Facilities that accept household asbestos” has a list of facilities that will accept asbestos. It is recommended to contact the facility first.

3.6 Management Measures

3.6.1 General Measures

The following general site management measures are recommended for preliminary site works:

- All excavated material (VENM and ENM) removed from the site has been classified in accordance with the EPA’s Waste Classification Guidelines before it is disposed of at an approved waste management facility.
- Uncontaminated soils may be reused onsite to even out cut and fill;
- It is recommended that organic waste from clearing of trees would be chipped and reapplied as mulch or delivered to an organics processor;
- No vegetation would be pushed into or applied to ecologically sensitive areas;

- Materials would be reused or recycled wherever possible;
- Separate bins would be provided for source separation of waste types where possible;
- Residual waste would be disposed of to a licensed landfill;
- Litter on the site would be managed daily to maintain a tidy environment;
- The disposal of nightsoil from portable toilets would be managed by a licenced contractor;
- Transport of waste would be managed by a licenced operator; and
- Records would be kept of transport and disposal of materials.

3.6.2 Hazardous Waste Management

All hazardous waste identified on site are to be handled, stored and disposed of in accordance with the Hazardous Materials Assessment (HMA) prepared by Waratah Consulting Services Pty Ltd, 2024. The HMA identifies the following protocol for handling and storing hazardous or potentially hazardous materials:

- all waste fill/soils will be classified in accordance with the EPA (2014) Waste Classification Guidelines.
- If prior immobilisation treatment of the waste soils is required, disposal consent will be obtained from the NSW EPA prior to spoil transport.
- All excavated soils shall be stockpiled separately within the designated excavation area or transported to a suitable compound (with appropriate waste tracking documentation) for temporary storage, to enable waste classification sampling and testing.
- All stockpile heights must be limited to a maximum of 2m.
- After waste classification, the materials will be transported and disposed to EPA-licensed waste landfill facilities. In accordance with the NEPM (2013) guidelines, stockpiled fill/soils will be sampled and laboratory analysed for waste classification purposes in accordance with appropriate methodology.
- If the stockpiled materials contain concentrations of contaminants that exceed the disposal guidelines for Restricted Solid Waste (i.e. the materials are classed as potentially Hazardous Waste), they will be held on-site pending the determination of alternative disposal arrangements and/or onsite treatment. If required, disposal content will be sought from the EPA NSW prior to spoil transport.

The following general measures will be employed in the management and storage of hazardous materials to reduce risks associated with them:

- Designated storage locations will be secure, ventilated area with clear signage, ensuring segregation and secondary containment for potential leaks.
- The area designated for storing any potentially hazardous materials will maintain controlled access by authorised personnel only.
- Any containers required to hold hazardous materials will be compatible, sealed containers, properly labelled with hazard symbols and storage instructions.
- Safety equipment such as PPE, fire protection or spill kits we be made available at the site, nearby proposed storage location for any potentially hazardous materials.
- Records of stored materials will be retained and collection by licensed contractors will be noted against all hazardous materials collected from the site.
- Regularly monitoring of hazardous materials storage for potential risks and action taken to rectify those risks will be retained in a logbook.

3.6.2.1 Asbestos

The handling of asbestos requires special precautions due to the hazardous nature of the materials. Any handling of asbestos waste must be performed in accordance with Clause 42 of the PoEO Act, 1997.

Before commencing any work, a risk assessment should be carried out. Safe work procedures would be devised that minimise exposure.

Handing requirements include:

1. Keep asbestos damp but prevent excess runoff water.
2. Asbestos should be collected, labelled and sealed using plastic or leak-proof containers.
3. Storage would be at a secure site in labelled, lined bins or a leak-proof container.
4. Asbestos containing materials should be removed from the site as soon as practicable and/or collected and stored in a manner approved by the EPA or an appropriate disposal authority.
5. Transport would be in a covered leak-proof vehicle or a manner approved by the OEH.
6. Disposal in a manner and at a site approved by OEH or an appropriate disposal authority.
7. Vehicles must be cleaned before leaving the landfill site.

If asbestos is found onsite it would be contained in accordance with the Remediation Action Plan or disposed of in the following manner:

- A risk assessment would be conducted to determine appropriate management measures,
- Asbestos waste would be disposed of in a landfill which is licensed to receive asbestos waste,
- Asbestos waste would be wetted, wrapped in 200um thick plastic, and sealed with tape before it is transported,
- It would be clearly labelled as “asbestos waste”,
- It would be transported in a covered, leak-proof vehicle,
- Copies of receipts from landfills where asbestos was taken would be retained, and

If the amount of asbestos is more than $10m^2$, a qualified asbestos removalist would be engaged.

4 Operational Waste Management

4.1 Overview

Operational waste management at the site arises from proposed daily activities as an MHE (332 homes) with associated community facilities. Waste management strategies related to site operations have been established according to Chapter B6 Waste Not – Site Waste Minimisation and Management of the MDCP 2011 and NSW EPA guideline documents.

The following space calculations are based off the mobile garbage bin (MGB) and bulk bin dimensions sourced from NSW EPA's *Better Practice Guide for Resource Recovery in Residential Developments* (2019) (Table 6).

Table 6: Mobile Garbage Bin (MGB) and Bulk Bin capacity and footprint

Bin Capacity (L)	Height (mm)	Depth (mm)	Width (mm)	Footprint (Approx. m^2)
120	940	560	485	0.30-0.33
240	1,100	735	580	0.41-0.43
660	1,250	850	1,370	0.86-1.16
1,100	1,470	1,245	1370	1.33-1.74

Source: NSW EPA's Better practice guide for resource recovery in residential developments (2019).

4.2 Residential Waste Management

4.2.1 Waste Generation

The Conceptual DA proposes the creation of approximately 332 MHE homes and will likely target the over 55s market. Mid North Coast Projects has informed MRA that similar MHE communities occupy approximately 1.6 residents per home. As such, EPA waste generation rates for two-bedroom apartments has been utilised in this WMP for estimating weekly waste generation rates in Table 7.

Table 7: Weekly Waste Generation Volumes

Dwelling units	Waste Stream	Generation rate	Weekly Volumes (L)
332	General waste	100L/unit/week	33,200
	Recycling	100L/unit/week	33,200
	FOGO*	25L/unit/week	8,300

4.2.2 Waste Storage Requirements

Waste storage requirements for the site have been determined on the basis of dwellings utilising shared bin bays strategically sited at the ends of proposed streets and at other key points to ensure efficient access for residents. At a maximum, bin storage bays will service approximately up to 8-16 dwellings (most will service less) and on this basis, bin type and collection schedules for the site have been described in Table 8.

Table 8: Residential waste storage and bin type

Waste Stream	Site Weekly Generation (L)	Waste per Bin Bay (L/Week) (assuming max 13 dwellings)	Collection Rate	Bin Allocation	Minimum Space Required (m^2)*
General Waste	33,200	1,200	Up to 2 times per week	1 x 660L	2
Recycling	33,200	1,200	Up to 2 times per week	1 x 660L	2
FOGO*	8,300	319	Up to 2 times per week	1 x 240L	1
				Total Space Requirement	**5m^2**

**Storage space for FOGO bins have been included given upcoming NSW Mandates. Onsite composting has been proposed for the development which can be trialled with residential FOGO waste. This is to be observed by site management to assess the viability of a FOGO waste collection service.*

Approximately **36** bin bays are proposed to be spread across the manufactured housing development (see Appendix C). In relation to the number of dwellings, the average bin bay will service 10 units, with each one mapped to service between 8-13 dwellings (13 maximum). Each bin bay is to be at least 5m^2 to accommodate for the proposed MGBs. Bin bays are to be spread evenly around the site to ensure access paths for residents do not exceed 50m. 660L MGB's are the proposed bin type for both general waste and recycling streams.

The selection of MGB's offers a good mix of manoeuvrability and storage capacity to accommodate effective storage for residents and efficiently servicing on collection days.

Building management can observe the bin fullness levels across bin bays at the site once the site is occupied and adjust the number of bins accordingly as required. The bin storage areas for the site will be sufficiently sized to accommodate proposed bins and have space to facilitate potential changes to waste servicing in the future.

Temporary waste storage and disposal

Each dwelling is to be provided with space to store at minimum one day's garbage waste and recycling generated. Residents will be responsible for the transfer of waste from the dwelling to the communal bins within their designated bin bay on each street. All residents within the MHE will have at least a single car garage. There is ample space for residents to store waste for at least one day's storage in garages. This is inclusive of the temporary storage of bulky waste.

Bulky Waste

Bulky waste items include those that cannot be disposed of in general waste and recycling bins, including but not limited to broken/damaged/old whitegoods, furniture, appliances, mattresses, etc. A site wide centralised bulky waste storage area is provided in the maintenance shed. Residents are responsible for the transferring of bulky waste items from their dwellings to the bulky waste storage area. Site management can observe the storage area capacity and organise bulky waste collections via a licensed waste contractor as needed.

4.2.3 Collection Schedule

Waste generated from the proposed MHE will be collected up to two (2) times per week by a private waste contractor. The private waste contractor will perform an onsite collection, collecting bins from each separate bin bay.

5 Waste Management Systems

5.1 Waste Management System Summary

The following specific management methods are proposed for the various collection waste streams expected to be generated at the site, including alterative waste streams outside of general waste, recycling and organics:

- **General Waste:** General waste shall be placed within a tied plastic bag prior to transferring into collection bins. For collection purposes, general waste shall be stored within a mobile garbage bin (MBG).
- **Commingled Recycling:** All recyclables will be stored in commingled bins (mixed plastic, paper, cardboard, glass, aluminium, steel). All recyclables should be decanted loose (not bagged) with containers un-capped, drained and rinsed prior to disposal into the recycling bin. Paper should be flattened and placed in paper and cardboard bin if applicable.
- **Garden Waste:** It is expected that landscaping at the site will be maintained by an external contractor who will remove all vegetation waste from ongoing maintenance activities.
- **Paper and Cardboard:** Should large quantities of paper and carboard waste be generated from proposed site uses a separate service may be suitable for application at the site. The contracted waste service provider may be able to provide separate paper and cardboard bins for the source separation and collection of paper and cardboard waste.
- **Food Waste:** Residential food organics waste generation from the development can be collected and treated on-site at small scale should management decide to do so via the composting amenity. Organics treatment can be used to produce conditioners, compost or vermiculture castings for application on or off-site. Equipment options include different size and capacity composters, dehydrators, worm farms and macerators. For organics treated to acceptable standards, discharge of effluent or any output to sewer as commercial trade wastewater may be permitted.

  The proposed development has accommodated a communal composting area which residents would be capable of attending to dispose of food waste for composting (see Appendix D). Alternatively, bin bays may be presented with FOGO bins for the disposal of garden and food organic waste.
- **Other (Problem) Waste:** The disposal of hard, bulky, electronic, liquid or potentially hazardous wastes shall be organised between the operator and site users as necessary.

5.2 Waste Management and Recycling Method

The flow of **residential waste and recycling** goes from generation to collection through several steps:

1. Waste is temporarily stored within the dwelling at its point of generation in an appropriately sized receptacle, clearly marked for type of waste (for example, in the kitchen);
2. Residents are to transfer waste to the designated bin bay for appropriate disposal into their respective bin bay.
3. Site management are responsible for maintenance of bins and the bin bays, ensuring bins are clean and in working order. Site management are also responsible for switching out full bins and monitoring bin fullness;
4. Site management is to ensure contracts with a private waste contractor, who also ensure appropriate collection scheduling and access is organised to minimise noise, odour, vermin, and visual amenity impacts to staff, visitors and the public.

5.3 Management System and Responsibilities

The site manager will be responsible for the management of waste at the site. Should there be any issues that impact on the operational efficiency, safety and suitability of waste management, management will be responsible for making any necessary changes, responsibilities include:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information on sorting methods for recycled waste, awareness of waste management procedures for waste minimisation and resource recovery;

- Maintaining a valid and current contract with a licensed waste service provider for waste and recycling collection and disposal;
- Making information available to residents and visitors about waste management procedures;
- Organising, maintaining and cleaning bins as part of a regular maintenance schedule;
- Manoeuvring bins to specified onsite collection point prior to and following scheduled collection of waste bins;
- Organising bulky waste collections as required;
- Ensuring bin allocation and waste/recycling collection frequency is adequate. Requesting additional infrastructure or services where necessary; and
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry.

5.4 Collection Method and Loading Areas

Bins will be collected by a private waste contractor onsite directly from each bin bay. Table 9 outlines the requirements and specifications of each collection component.

Table 9: Collection points and loading areas requirements and specification

Component	Requirement	Specification
Collection point	Allow safe waste collection and loading operations	- Adequate clearance and manoeuvring space; - Sufficient clearance for the safe handling of materials and equipment; and - Sectioned loading bay does not impede upon traffic and pedestrian safety.
Vehicle manoeuvring and loading space	Truck space for adequate lift clearance, manoeuvring and operation for a contractor collection vehicle	- Collection from each site use loading area by a rear lift collection vehicle; - Adequate loading bay dimensions to not impede lift clearance; - Operational clearance for truck manoeuvring in a forward direction; and - The provision of space clear of vehicle parking spaces (level and free of obstructions).
Operating times	Appropriate collection times to limit noise and traffic disturbance	- Collection times will be arranged during off-peak times to ensure minimal disturbance to pedestrians and visitors.

Further to the above, the site will be designed to accommodate a rear-lift waste collection vehicle in accordance with the NSW EPA *Better Practice Guidelines*, per Figure 3 below. The expected largest waste collection vehicle is approximately 10.5m long per the guidelines. Swept paths for heavy rigid vehicles are provided in Appendix A.

Figure 3: Table of standard waste collection vehicle dimensions

Table B2.1: Collection vehicle dimensions

Vehicle type	Rear-loading	Side-loading*	Front-lift-loading	Hook truck	Crane truck
Length overall (m)	10.5	9.6	11.8	10.0	10.0
Width overall (m)	2.5	2.5	2.5	3.0	2.5
Travel height (m)	3.9	3.6	4.8	4.7	3.8
Height in operation (m)	3.9	4.2	6.5	7.1	8.75
Vehicle tare weight (t)	13.1	11.8	16.7	13.0	13.0
Maximum payload (t)	10.0	10.8	11.0	14.5	9.5
Turning circle (m)	25.0	21.4	25.0	25.0	18

* The maximum reach of a side arm is 3 m.

Sources: JJ Richards, SUEZ, MacDonald Johnson, Cleanaway, Garwood, Ros Roca, Bingo and Edbro. Figures shown represent the maximum dimensions for each vehicle type.

Source: NSW EPA (2019) Better Practice Guide for Resource Recovery in Residential Developments.

5.5 Waste and Recycling Storage Areas

The waste areas will provide centralised storage that has adequate capacity to receive and store the maximum likely generation of waste and recycling between collection times. In accordance with the MDCP 2011, it is recommended the bin storage areas be designed with the following considerations:

- Storage areas reflect the equipment, infrastructure, manoeuvring space and potential future needs of the development;
- Be located in a position that is convenient for users and waste collection staff, located away from habitable rooms;
- Waste handling, storage and collection systems for residential is to be separate and self-contained;
- All waste and recycling storage areas and access paths to be kept clean and free of obstructions;
- The floor being graded and drained to an approved drainage outlet connected to the sewer and having a smooth, even surface, coved at all intersections with walls;
- The walls being cement rendered to a smooth, even surface and coved at all intersections; and
- The room shall be adequately ventilated (either natural or mechanical) in accordance with the Building Code of Australia.
- There is to be reasonable level of access to waste and recycling area/s or room/s for people including people with a disability
- Consideration shall be given to the incorporation of a bulky waste storage area within the communal storage area/s or room/s.
- Servicing plan including frequency and servicing location is to be provided.

5.6 Signage

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia, 1994).

Signage will be designed to consider language and non-English speaking backgrounds, vision impairment and accessibility. Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in the waste room indicating:

- Details regarding acceptable recyclables;
- Recyclables are to be decanted loose (not bagged);
- *No standing* and *danger* warnings apply to the area surrounding the waste storage area;
- Contact details for arranging the disposal of bulky items; and
- The area is to be kept tidy.

Standard signage requirements and guidance for application apply (see Appendix E).

5.7 Prevention of Pollution and Litter Reduction

To minimise dispersion of litter and prevent pollution (to water and land via contamination of runoff, dust and hazardous materials), building management and the site cleaning staff will also be responsible for:

- Maintenance of open and common site areas;
- Ensuring waste areas are well maintained and kept clean;
- Securing the waste storage area from vandalism and the escape of litter;
- Identification and appropriate disposal of goods with hazardous material content (paints, e-waste, fluorescent tubes);
- Taking action to prevent dumping and unauthorised use of waste areas; and
- Requiring contractors to clean up any spillage that may occur during waste servicing or other work.

6 References

Australian Department of Sustainability, Environment Water, Population and Communities (2011) Construction and Demolition Waste Guide - Recycling and Re-use Across the Supply Chain.

Australian Standards 4123.7 Mobile Waste Containers.

Maitland Development Control Plan 2011

Maitland Local Environmental Plan 2011

NSW EPA (2012) Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities.

NSW EPA (2021) NSW Waste and Sustainable Materials Strategy 2041.

NSW EPA (2014) Waste Classification Guidelines.

NSW EPA (2016) Recycling Signs, Posters and Symbols. Available at: http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm.

NSW EPA (2019) Better Practice Guide for Resource Recovery in Residential Developments.

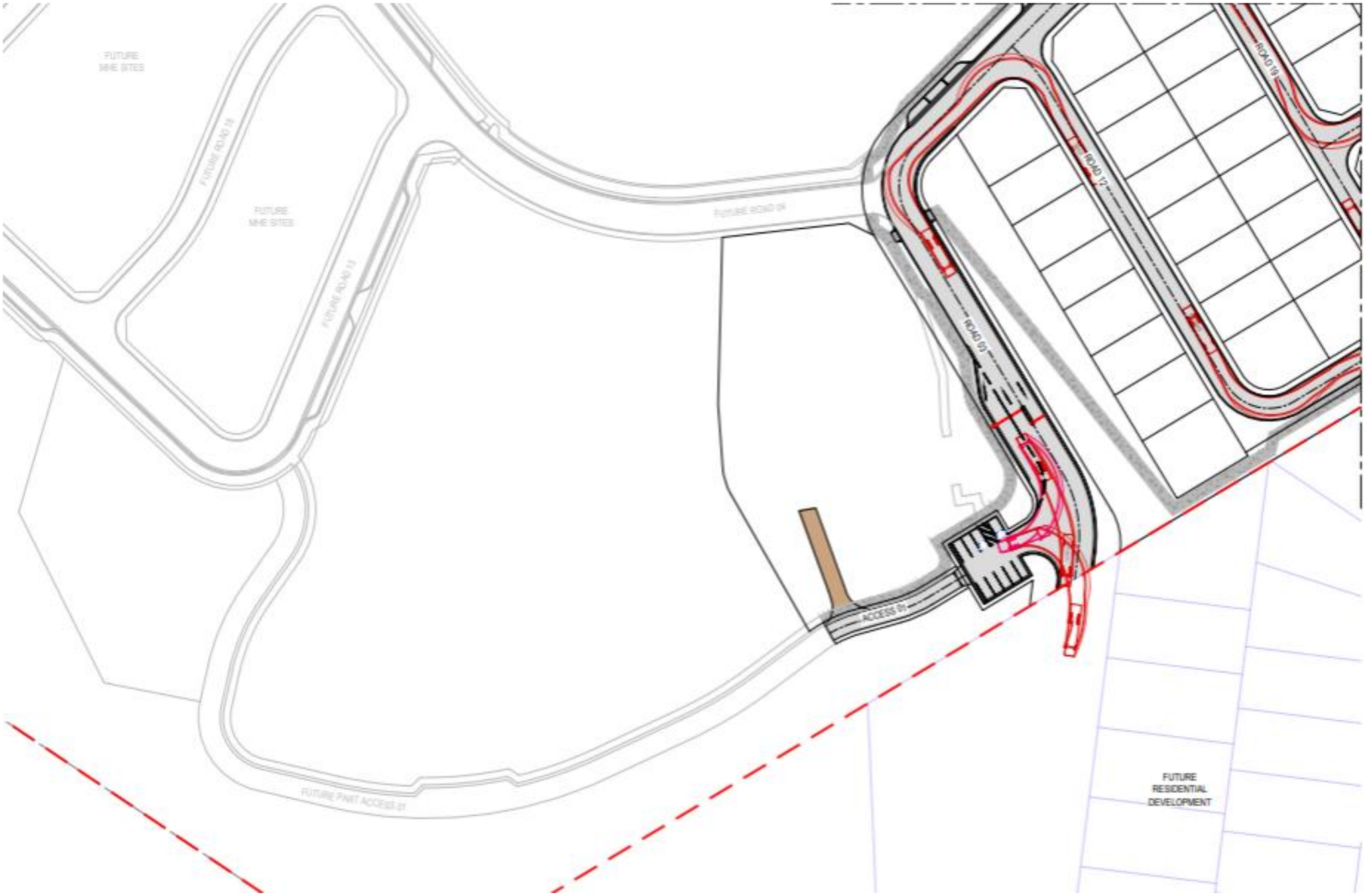
NSW Government (1979) Environmental Planning and Assessment Act.

NSW Government (1997) Protection of the Environment Operations Act.

NSW Government (2000) Environmental Planning and Assessment Regulation.

NSW Government (2001) The Waste Avoidance and Resource Recovery Act

Appendix A Waste Collection Vehicle Swept Paths



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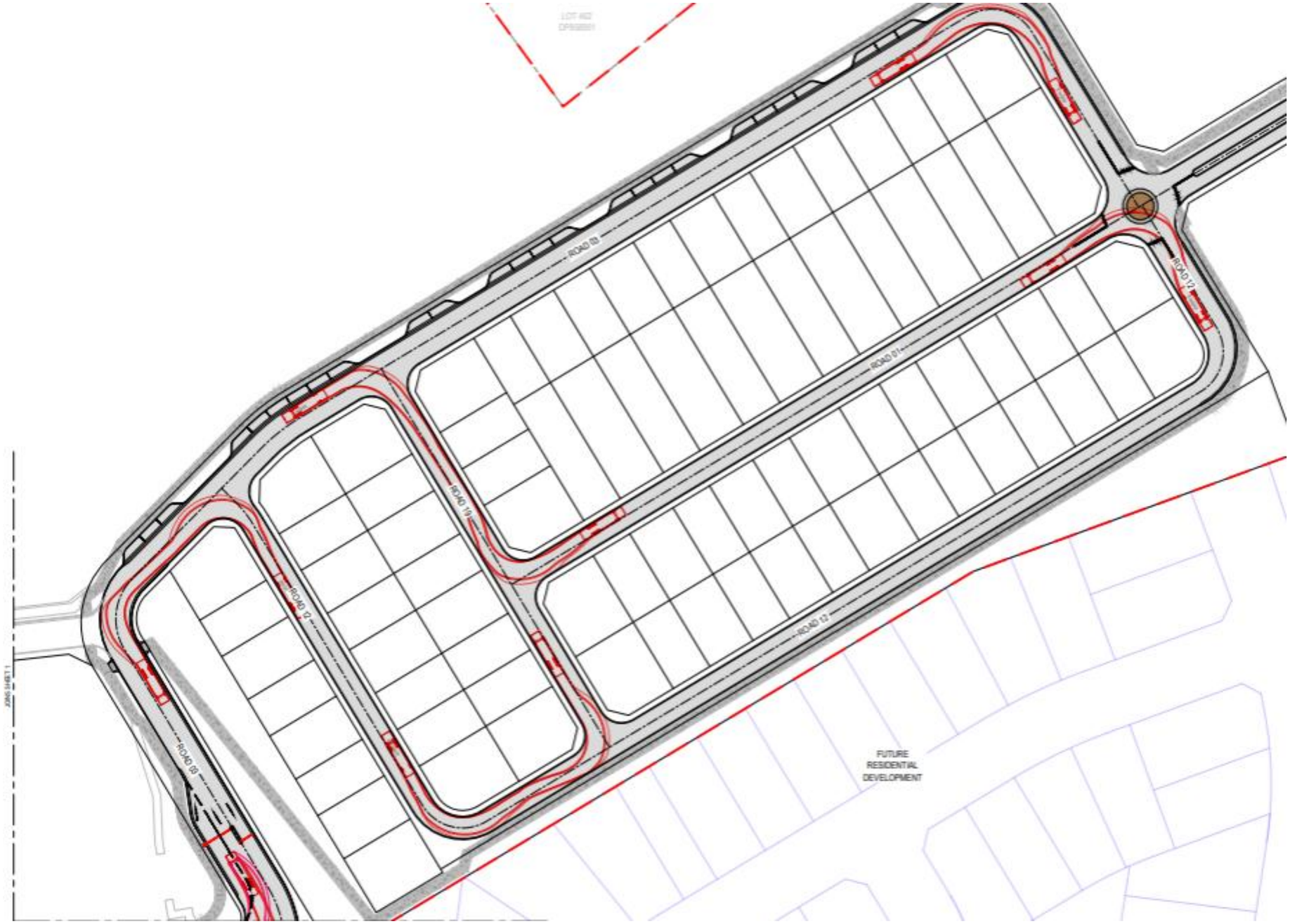

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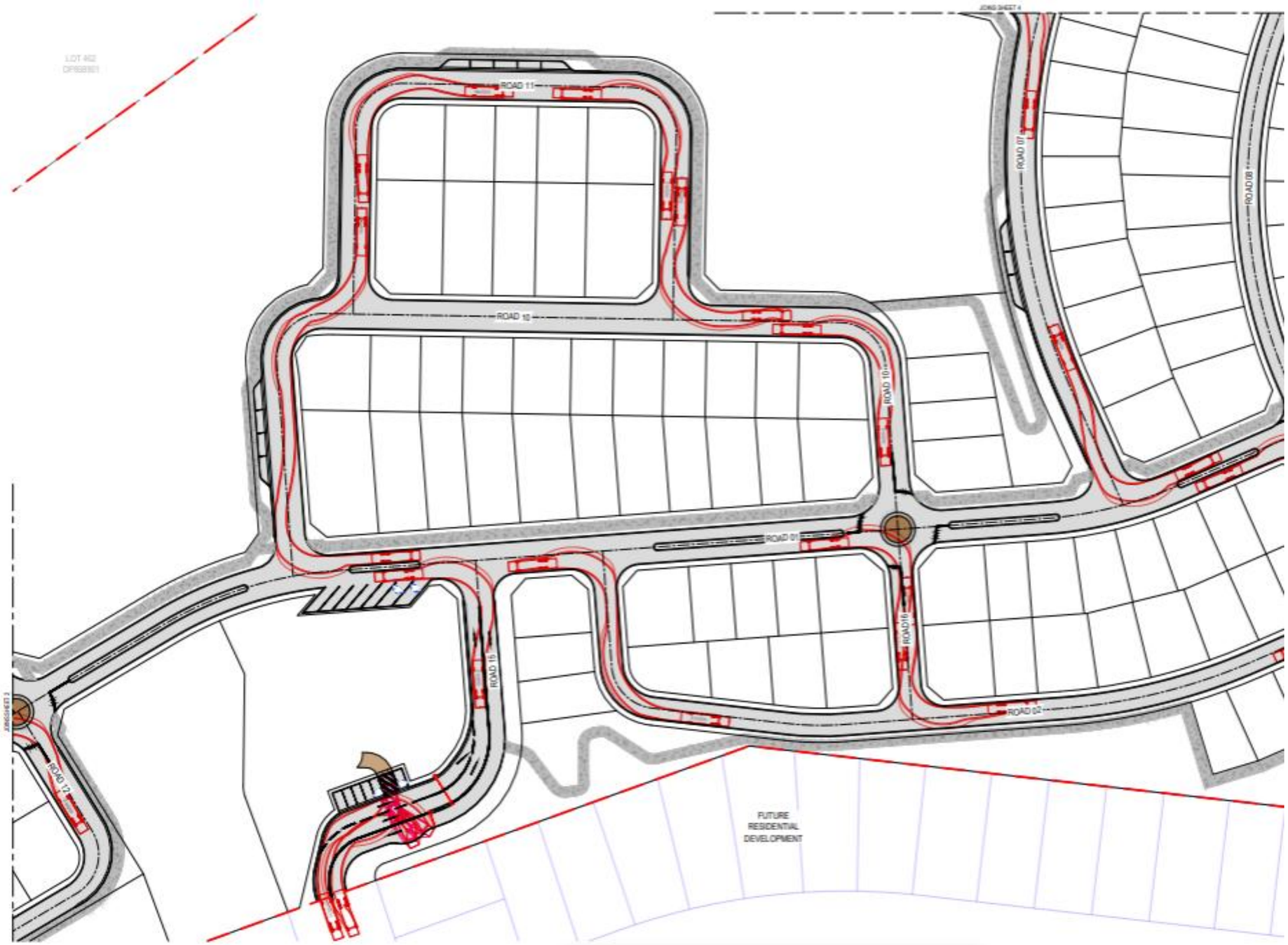

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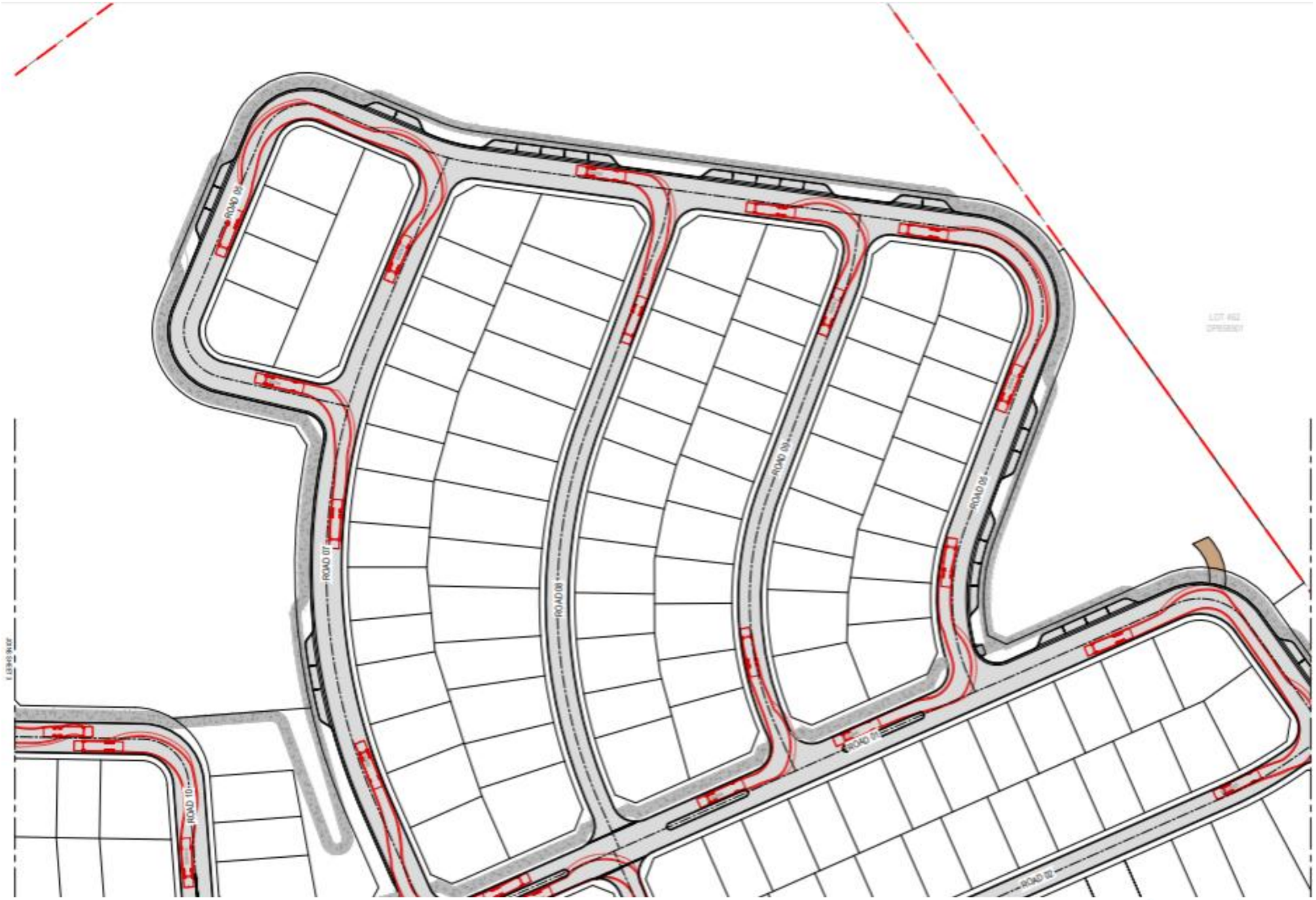
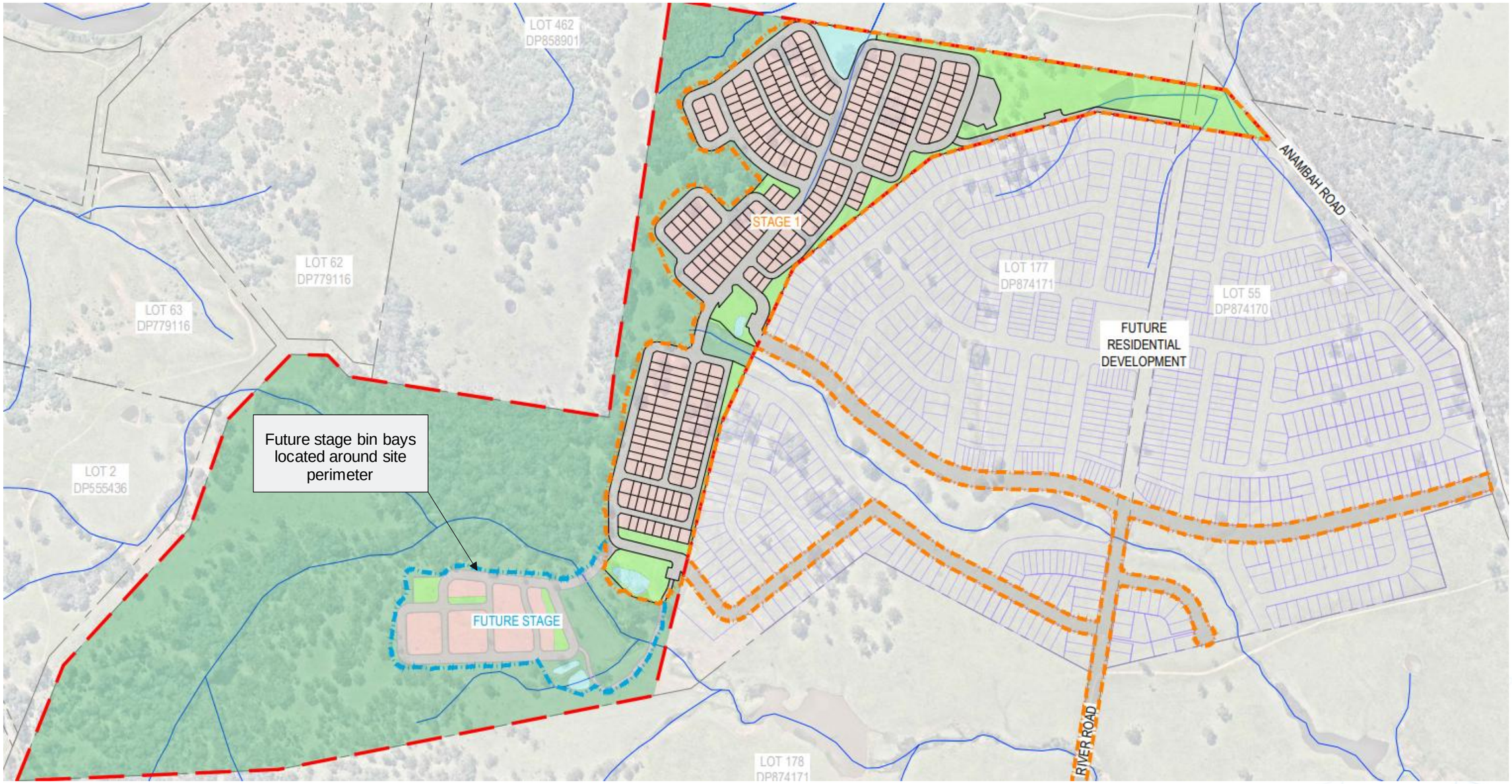


Source: Thirdi, 2024

Source: Thirdi, 2024

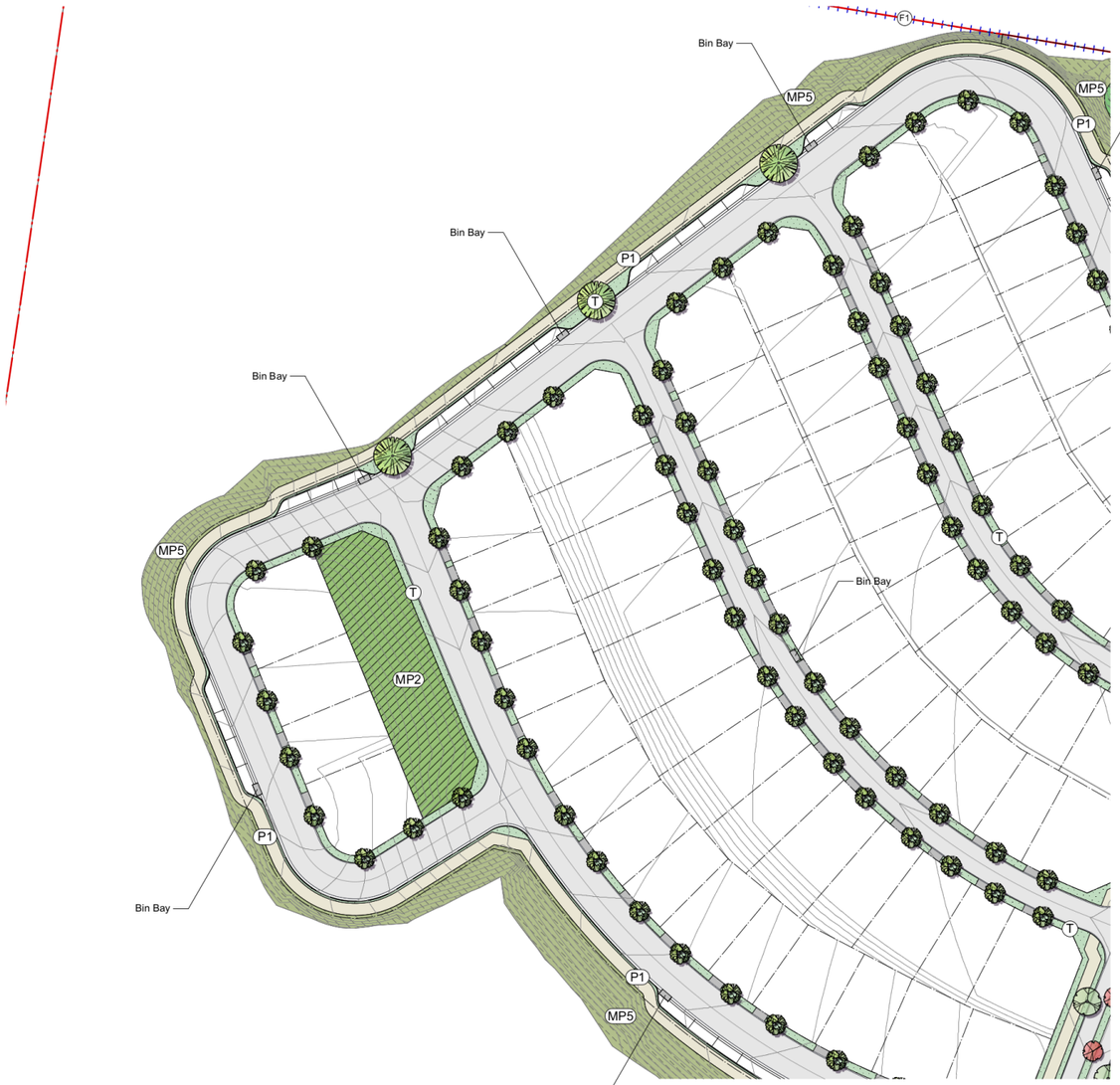
Appendix B Development Stages



Source: Thirdi, 2024

Appendix C Proposed Site Plans (incl. Bin Bay Locations)

Source: Thirdi, 2024.



3 LANDSCAPE PLAN C
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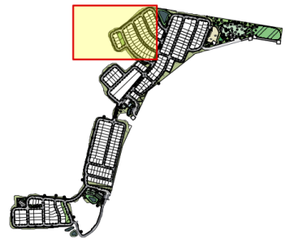

R REFERENCE PLAN
Scale: 1:10000 @ A1

0 10 20 30 40m

LEGEND

- Site boundary
- Lot boundary
- 12.95 Proposed Spot level
- P1 Concrete footpath
- P2 Concrete footpath
- P3 Concrete paving
- T Turf
- G Gravel
- Road
- Chicken Coop
- Community Garden
- F1 Fence 1 - Rural 4-strand wire fence to tie into existing paddock fencing
- F2 Fence 2 - 1.2m palisade
- Retaining Wall (Sandstone)
- Feature Wall (Sandstone)
- Existing Tree to be retained

TREES

- *Angophora costata* Sydney Red Gum
- *Eucalyptus sideoxylon 'Rosea'* Pink Flowered Ironbark
- *Waterhousea floribunda* Weeping Lilly Pilly
- *Corymbia maculata* Spotted Gum
- *Ficus rubiginosa* Port Jackson Fig
- *Tristaniopsis laurina 'Luscious'* Water Gum
- *Corymbia eximia 'Nana'* Dwarf Yellow Bloodwood
- *Angophora hispida* Dwarf Apple
- *Eucalyptus fibrosa* Red Ironbark
- *Elaeocarpus eumundi* Smoothed leaved Quandong

MASS PLANTING

- MP1 Mass Planting Type 1 - *Refer to Planting Schedule LDD701*
- MP2 Mass Planting Type 2 - *Refer to Planting Schedule LDD701*
- MP3 Mass Planting Type 3 - *Refer to Planting Schedule LDD701*
- MP4 Mass Planting Type 4 - *Refer to Planting Schedule LDD701*
- MP5 Mass Planting Type 6 - Batter Planting - *Refer to Planting Schedule LDD701*
- BP1 Basin Planting 1 - Deep Bank - *Refer to Planting Schedule LDD701*
- BP2 Basin Planting 2 - Top Bank - *Refer to Planting Schedule LDD701*

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ENGINEER:
Maker ENG

CLIENT:
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Status: DA

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LANDSCAPE PLAN C

SCALE: AS SHOWN
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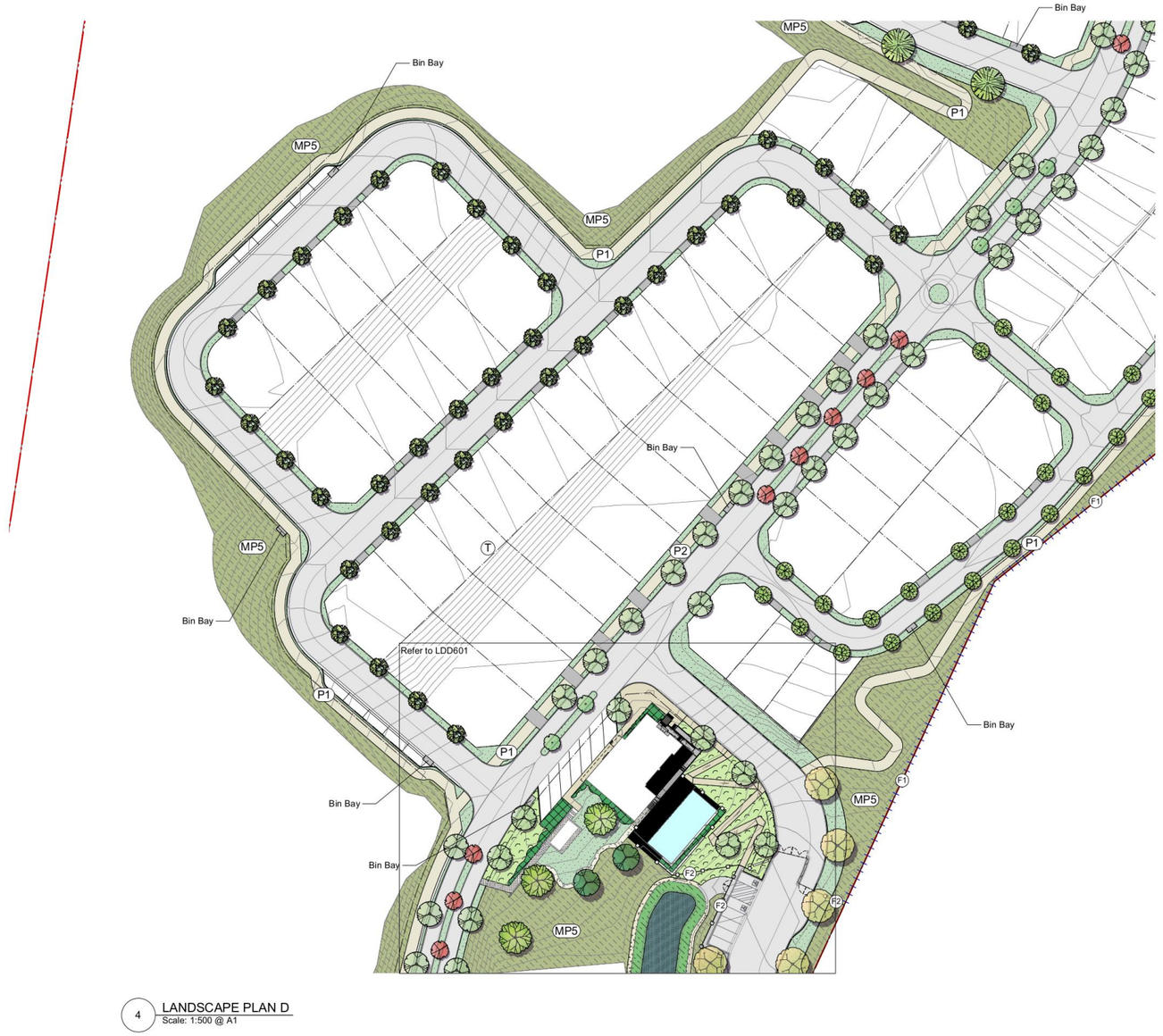
Drawn By: CA
Reviewed By: VH | YZ

Project No. 2529
Drawing No. LDD403
Rev C

Source: Thirdi, 2024



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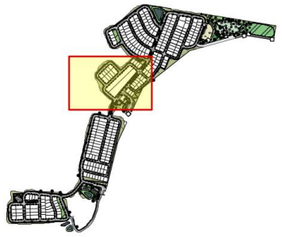
Scale: 1:500 @ A1



R REFERENCE PLAN
Scale: 1:10000 @ A1

0 10 20 30 40m

LEGEND

- Site boundary
- Lot boundary
- 12.95 Proposed Spot level
- P1 Concrete footpath
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- MP3 Mass Planting Type 3 - *Refer to Planting Schedule LDD701*
- MP4 Mass Planting Type 4 - *Refer to Planting Schedule LDD701*
- MP5 Mass Planting Type 6 - Batter Planting - *Refer to Planting Schedule LDD701*
- BP1 Basin Planting 1 - Deep Bank - *Refer to Planting Schedule LDD701*
- BP2 Basin Planting 2 - Top Bank - *Refer to Planting Schedule LDD701*

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LANDSCAPE PLAN D

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Reviewed By: VH | YZ

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Rev C

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5 LANDSCAPE PLAN E
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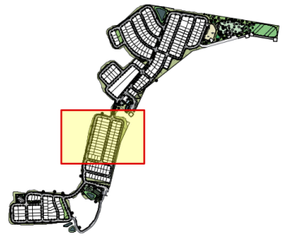

R REFERENCE PLAN
Scale: 1:10000 @ A1

0 10 20 30 40m

LEGEND

- Site boundary
- Lot boundary
- 12.95 Proposed Spot level
- P1 Concrete footpath
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- MP3 Mass Planting Type 3 - *Refer to Planting Schedule LDD701*
- MP4 Mass Planting Type 4 - *Refer to Planting Schedule LDD701*
- MP5 Mass Planting Type 6 - Batter Planting - *Refer to Planting Schedule LDD701*
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LANDSCAPE PLAN E

SCALE: AS SHOWN
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Drawn By: CA
Reviewed By: VH | YZ
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Drawing No. LDD405
Rev C

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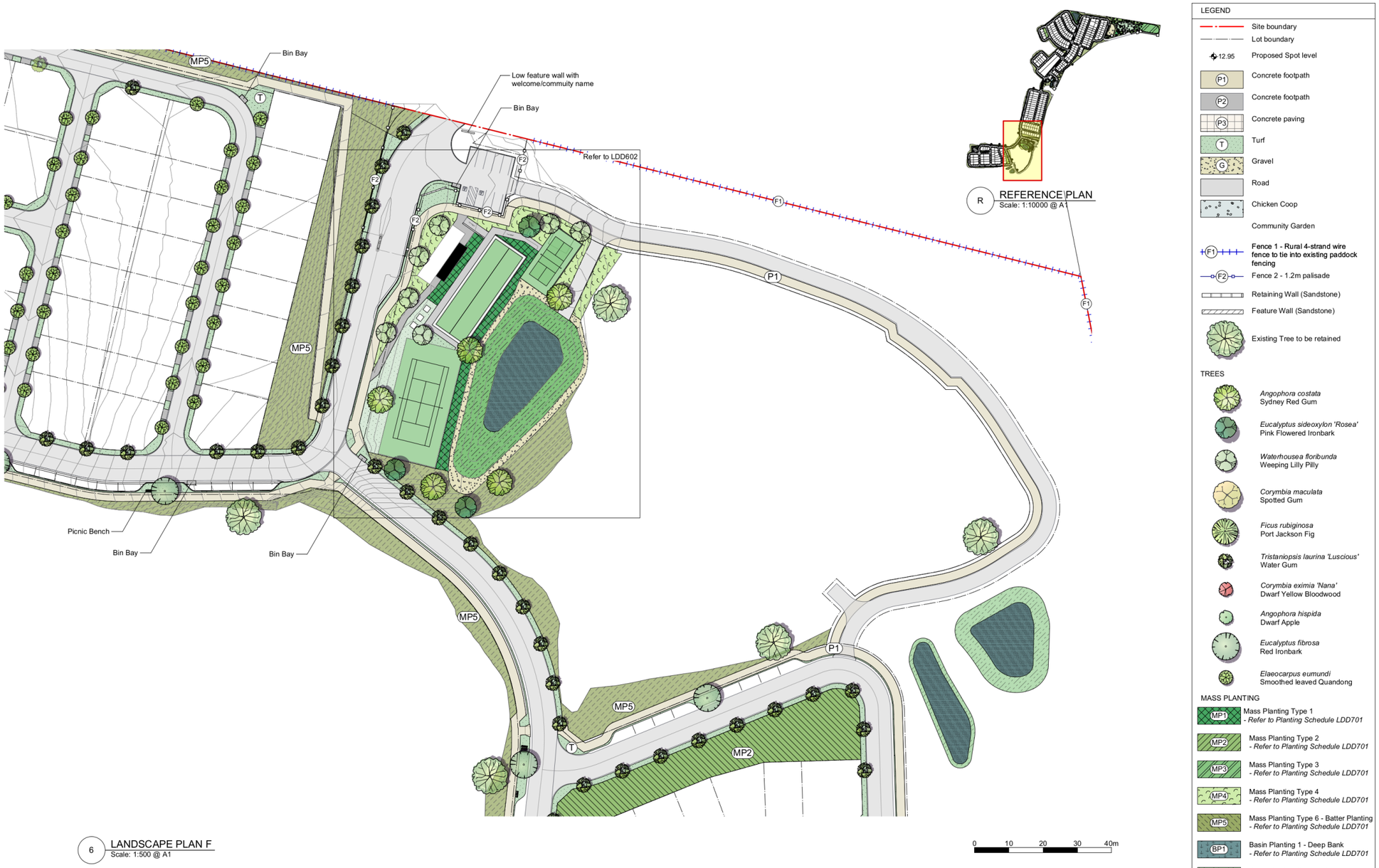

6 LANDSCAPE PLAN F
Scale: 1:500 @ A1

LEGEND

- Site boundary
- Lot boundary
- 12.95 Proposed Spot level
- P1 Concrete footpath
- P2 Concrete footpath
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- MP2 Mass Planting Type 2 - *Refer to Planting Schedule LDD701*
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- MP5 Mass Planting Type 6 - Batter Planting - *Refer to Planting Schedule LDD701*
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LANDSCAPE PLAN F

SCALE: AS SHOWN
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Reviewed By: VH | YZ

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Drawing No. LDD406
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LANDSCAPE PLAN G

SCALE: AS SHOWN
ORIGINAL DRAWING AT A1.
Drawn By: CA
Reviewed By: VH | YZ
Project No. 2529
Drawing No. LDD407
Rev C

Source: Thirdi, 2024

Appendix D Communal Compost Bin Location

Source: Thirdi, 2024.

Appendix E Standard Signage

Waste Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the NSW EPA.

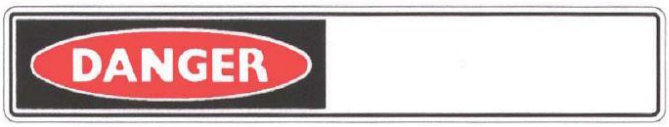
Standard symbols for use in signage, bin facade and educational materials are promoted through the NSW Environment Protection Authority. They are available for download from the NSW EPA website (NSW EPA 2016b), in black and white and colour versions. The Australian Standard series AS 4123 (Part 7) details colours for mobile waste containers (Standards Australia 2008).

Figure 4: Examples of standard signage for bin uses

Safety Signs

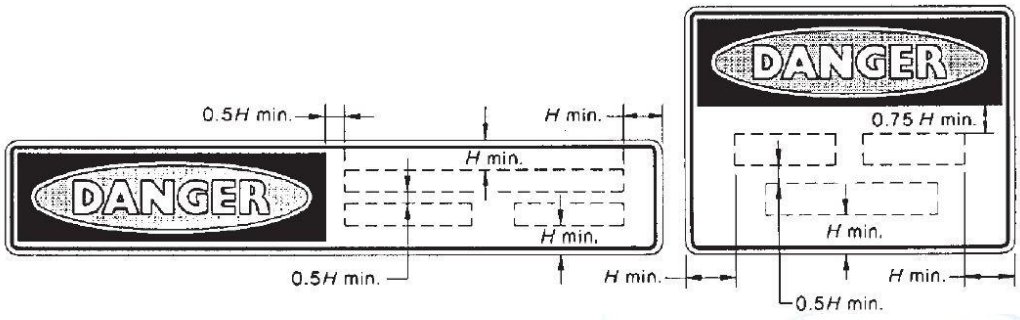
The design and use of safety signs for waste and recycling rooms and enclosures should comply with AS 1319 (Standards Australia 1994). Safety signs should be used to regulate, and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples. Clear and easy to read 'NO STANDING' and 'DANGER' warning signs must be fixed to the external face of each waste and recycling room where appropriate.

Figure 5: Example and layout of safety signage



(d) Horizontal

FIGURE D5 TYPICAL ARRANGEMENTS OF DANGER SIGNS



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