

Operational Waste Management Plan

Project:

Greater Flagstone State School



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Document Information

Prepared for GROUPGSA Pty Ltd	Job Reference MOD25650QLD – OWMP
Project: Greater Flagstone New Primary School	

Document Control

Version	Date	Description of Revision	Prepared by	Reviewed By
A	18/03/26	DRAFT for review and comments	Y.S	A.S
B	24/03/26	Final	Y.S	A.S

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Definitions

In this OWMP, a term has the following meaning unless otherwise specified and is shown below.

Term	Description
Bin carting / transfer route	The proposed route to move bins between the refuse room (storage point) and the servicing point.
Bin (bulk / wheelie)	A container (steel or plastic) use for disposal and storage of refuse items. Bins come in various types and sizes from MGB's to up 360L and bulk from 660L to 4500L.
Collection / Servicing point	The designated area allocated to the temporary storage of waste bins for the period of servicing only. The point may be within or external to a development.
Compactor / Compaction unit	A device that provides mechanical compaction for refuse (typically general waste only). It allows for the reduction of bin numbers and collection frequency.
Composter	A container or machine used for composting specific organic material
General waste	Waste, other than domestic clean-up waste, green waste, recyclable waste, interceptor waste or waste discharged to a sewer, produced as a result of the ordinary use or occupation of domestic or commercial premises.
Gross Floor Area (GFA)	The GFA of all storeys of a building is measured from the outside of the external walls or the centre of a common wall. It is commonly measured in square metres (m ²)
Hazardous waste	Solid waste that is or contains toxic material, for example light bulbs, fluorescence lights, batteries.
Mobile Garbage Bin (MGB)	A plastic bin used for the storage and collection of refuse that is up to 360L in capacity. MGB's are typically used for kerbside collection for residential dwellings and on-site collection for commercial development.
Organic Waste	Waste that comes from plants or animals that is biodegradable for example green waste and food waste. Waste that comes from plants or animals that is biodegradable, for example, green waste and food waste.
Recycling	All material suitable for re-manufacture or re-use, e.g. glass bottles and jars; plastics such as PET, HDPE and PVC; aluminium aerosol and steel cans and lids; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines.
Refuse	Refuse is material generated and discarded from residential and commercial buildings including general waste, recyclables, green waste and bulky items.
Refuse Room / Storage point	The area allocated to the permanent storage of waste bins. This is the normal location of the waste bins and excludes the period when the bin is serviced. A storage point may be a common storage point or an individual bin storage point.
Refuse Collection Vehicle (RCV)	A vehicle specifically designed for collecting and emptying refuse bins and refuse compactors.
Front-End-Loading RCV	A truck specially designed to collect refuse (typically >1500L bins), from a front loading mechanism and haul the collected waste to a solid waste treatment facility.
Rear-End-Loading RCV	A truck specially designed to collect refuse (typically 660L & 1100L bins), from a rear loading mechanism and haul the collected waste to a solid waste treatment facility.
Side-Loading RCV	A truck specially designed to collect refuse (typically 240L bins), from a side loading mechanism and haul the collected waste to a solid waste treatment facility.
Transfer	Manual transfer means physical transfer of refuse material and associated bulk bins or trolleys without assistance.

1 Introduction

1.1 Overview

Modus has been engaged by GROUFGSA Pty Ltd to prepare an Operational Waste Management Plan (OWMP) in support of the proposed Greater Flagstone Primary School development.

This OWMP has been prepared on behalf of the State of Queensland, represented by the Department of Education, in support of a Priority Development Area (PDA) application over part of land at New Beith Road, Silverbark Ridge. This PDA development application seeks approval from The Minister for Economic Development Queensland (MEDQ) for a development permit for a material change of use for educational establishment, childcare centre, community facility & health care services.

The Applicant proposes a State primary school for Prep to Year 6, delivered in stages:

- ▶ Stage 1 opening in 2029 with capacity for approx. 712 enrolments.
- ▶ Stage 2 opening in 2031 with a cumulative enrolment capacity for approx. 1,092.
- ▶ Further undefined stage to provide a cumulative enrolment capacity of approx. 1,185.

The Applicant also proposes a childcare centre (kindergarten) and community facility/health care services (hub) to be delivered at Stage 1 of the State primary school. The:

- ▶ Childcare centre is intended to be a two-unit kindergarten providing for up to 44 children per day, and up to 88 children across the week, and 15 hours care per week per child.
- ▶ Community facility/health care services is intended to provide a range of services, supporting children and their families with early years programs and support, onsite health and wellbeing services, and family programs and activities.

The site is being created as part of a broader subdivision project delivered by Peet Flagstone City Pty Ltd under PDA development approvals DEV2024/1491 and DEV2023/1414. Works undertaken under these PDA development approvals provide the foundational infrastructure required to make the site 'fit for purpose' (including vegetation clearing, roadworks, sewerage, water supply, earthworks, telecommunications and electrical infrastructure).

This OWMP is to be used as a guide during the operational phase of the development only and requirements for demolition and/or construction phases will need a separate WMP. The purpose of the OWMP is to satisfy EDQ requirements and detail the following information:

- ▶ Refuse (type and quantity) likely to be generated during the occupancy of the proposed site.
- ▶ Refuse collection arrangements, including disposal, storage and transfer, during the occupancy of the proposed development.
- ▶ Operational requirements, including equipment and systems, and design requirements for the proposed development.

1.2 References

For the purpose of this assessment, the following references have been utilised:

- ▶ LCC Waste Management Planning Scheme Policy
- ▶ VIC Better Practice Guidelines for Waste Management
- ▶ City of Sydney Guidelines for Waste Management in New Developments
- ▶ Development Plans, prepared by Group GSA

1.3 Limitations

Modus has completed this OWMP in accordance with the usual care and thoroughness of the consulting profession. The assessment is based on accepted waste management practises and standards applicable at the time of undertaking the assessment. Modus disclaims responsibility for any changes to project planning or equipment requirements that may occur after completion of the assessment.

2 Existing Conditions

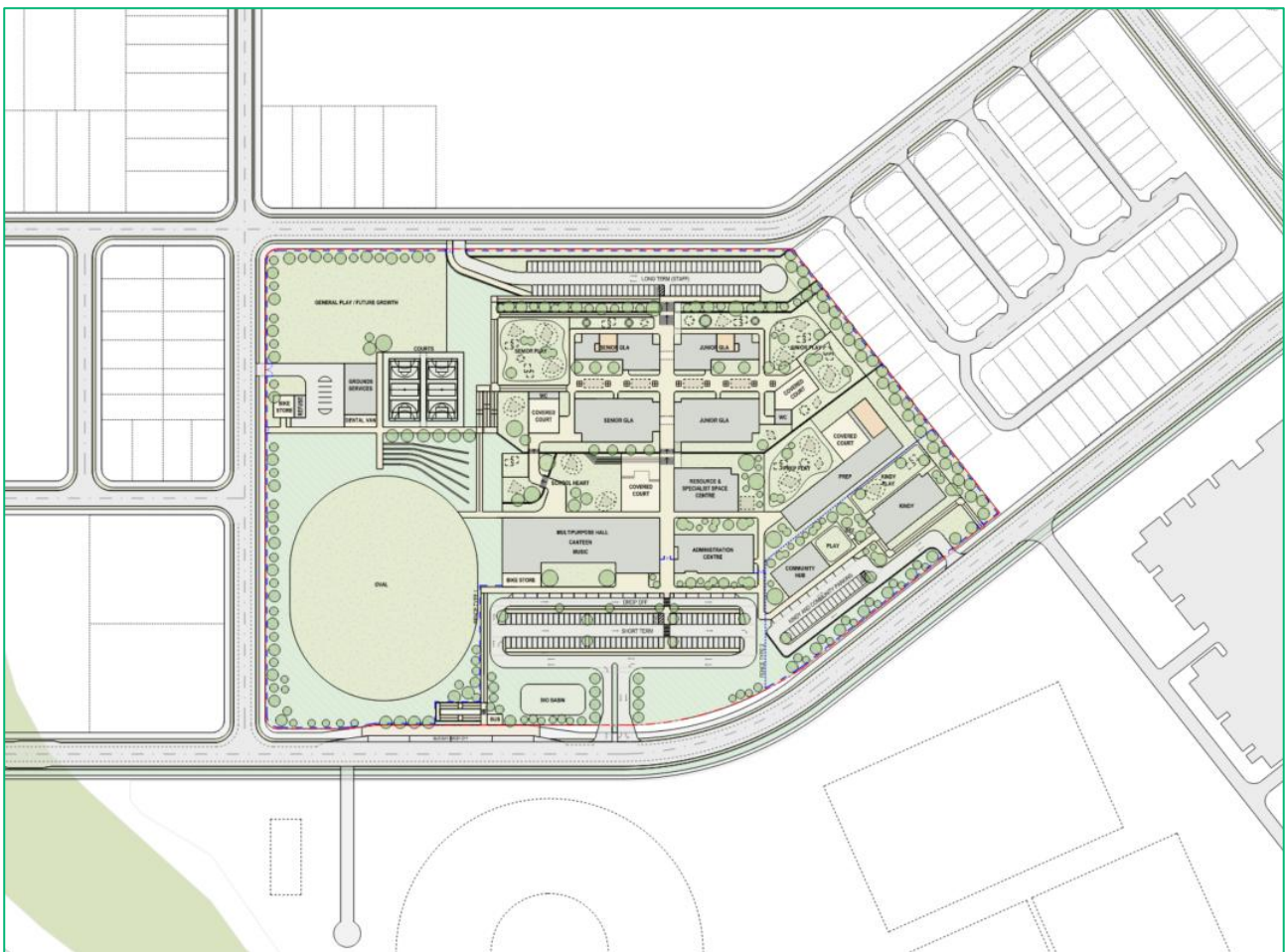
2.1 Site Location

The site is part of a broader subdivision project delivered by Peet Flagstone City Pty Ltd under PDA development approvals DEV2024/1491 and DEV2023/1414.

The development site is described as part of Lot 911 on SP356636 and will be bound by residential dwellings and a park to the east, and new roads in all other directions.

The site location is shown in Figure 2-1.

Figure 2-1 Site Location



Source: Group GSA, drawing 2004 – Masterplan Stage 3 90%

2.2 Existing Development and Refuse Arrangements

The site is currently undergoing earthworks and has no existing refuse arrangements.

3 Proposed Development

The proposed primary school is for Prep to Year 6, and will be delivered in three (3) stages which will provide an ultimate cumulative capacity of approximately 1,185 students.

Additionally, a childcare centre and community facility/health care services (hub) is proposed at Stage 1 of the State primary school.

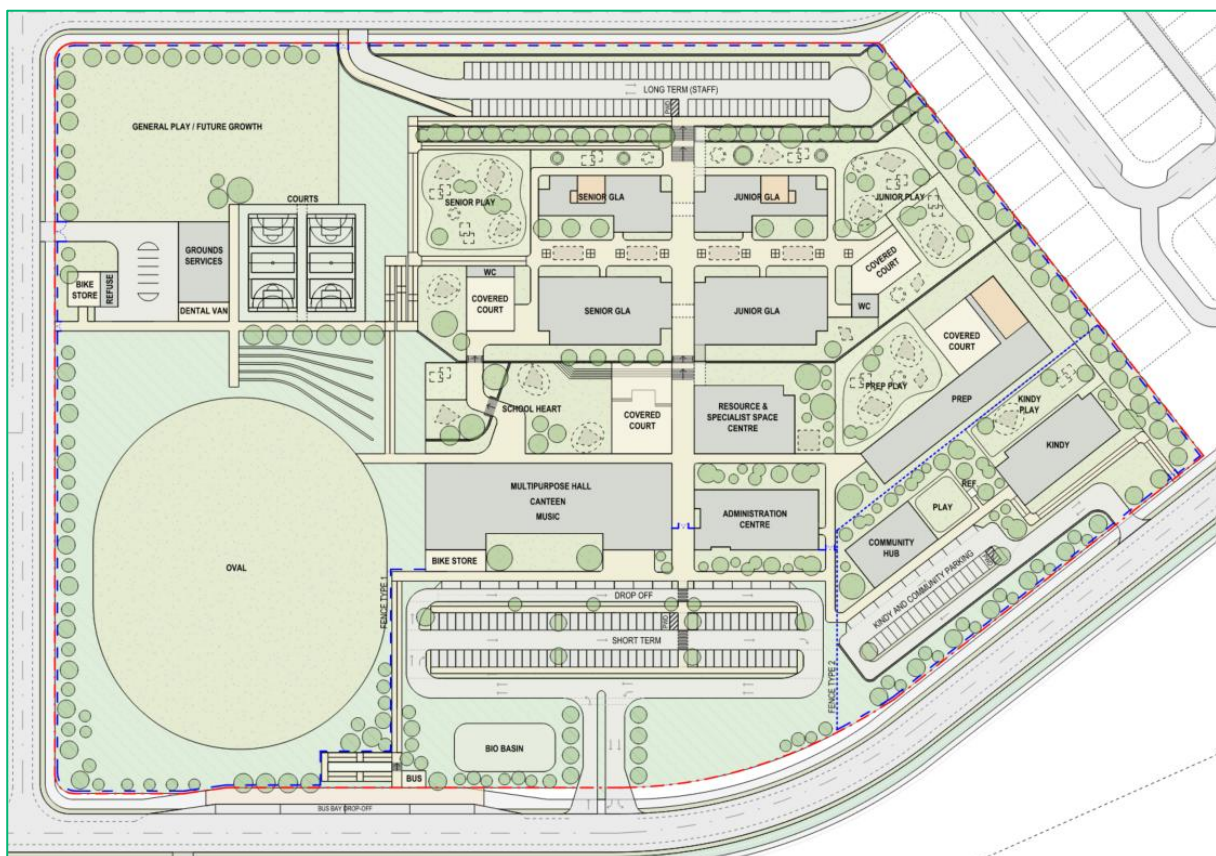
The proposed development yield has been outlined in Table 3-1.

Table 3-1 Development Summary

Proposed Use	Stage	Proposed Yield
Primary School	1	712 Students
	2	1,092 Students
	3	1,185 Students
Childcare	1	88 children, 318m ² GFA
Community Hub / Health Care Services	1	245m ² GFA

The proposed site plan is illustrated in Figure 3-1. A copy of the development plans can be found in Appendix A.

Figure 3-1 Proposed Development



Source: Group GSA, drawing 2004 – Masterplan Stage 3 90%

4 School Refuse Arrangements

4.1 Refuse Generation

4.1.1 Refuse Calculations

The anticipated refuse to be generated by the proposed development may consist of the streams outlined in **Appendix B**.

It is noted that Logan City Council (LCC) does not provide any guidance on generation rates. Therefore, to assess the waste generation for the proposed site, Modus has applied the VIC Better Practice Guide generation rates for an education use, as outlined below in Table 4-1. This generation rate is deemed sufficient for use as best practice, given the specific uses are applicable to the development. The calculations have been based on a 5-day per week operation for the site. Additionally, it is important to note that an assessment has been conducted for the total development once operational.

Table 4-1 School Refuse Generation

Use	Generation Rate (L/student/week)		Yield	Generation (L/Week)	
	General Waste	Commingle Recycling		General Waste	Commingle Recycling
Education	1.5	0.5	1,185 students	8,887.5	2,962.5

The refuse volumes are considered to be conservative and may vary according to the operation of the development. As such, bin numbers and collection frequencies may need to be altered to suit the building operation once operational.

4.1.2 Bin Numbers

The required equipment for the development is based on the volumes calculated in Table 4-1. Additional waste management / minimisation equipment may vary depending on the operation of the development.

Table 4-2 shows the bin requirements (number & size) and area required to accommodate the bins.

Table 4-2 School Bin Requirements

Description	Yield	General Waste	Commingle Recycling
Total	1,185 students	8,888	2,963
Daily Volumes (L per day)		1,270	423
Collection Frequency (per week)		3	3
Collection Volumes (L per week)		2,963	988
Bin Size		1500	1500
No. Bins		2	1
Bin Area		4m ²	2m ²
Refuse Enclosure (Storage and Collection)		62.6m ² (5.6m x 10.8m)	

4.1.3 Bins / Equipment

The refuse bins to be utilised for the proposed development is outlined below in Table 4-3.

Table 4-3 School Refuse Bins

Type	Dimensions (L x W x H)	Comments
80L-120L	559 x 279 x 635mm	For all streams School to supply and position in various locations. Several options and sizes are available from numerous suppliers, depending on preference and space available.
240L	730 x 585 x 1060mm	
1500L	1050 x 1800 x 1247mm	For all streams Generally supplied by private contractors prior to operation.

Depending on the operation of the development, additional refuse minimisation equipment and procedures can be implemented. Refuse minimisation and recommendations are detailed in Section 7.

4.1.4 Additional Equipment

Due to the provision of 240L wheelie bins located throughout the seating/eating/communal areas of the site, a bin lifter is required to decant into the bulk bins. The bins and bin lifter will be managed by the designated caretaker. An example of the equipment is illustrated on Figure 4-1.

Figure 4-1 Bin Lifter



4.2 Refuse Disposal

The typical refuse disposal arrangements are provided in Table 4-4.

Table 4-4 School Refuse Disposal

Stream	Process
General Provisions (Waste and Recycling)	▶ Small bins / receptacles will be provided around various locations within site, typically around staffrooms, classrooms and bathrooms. ▶ 240L bins will be provided around canteen / eating / seating / communal areas for disposal. ▶ As required, students and staff will dispose of their refuse in the appropriate receptacles / bins during the day. ▶ During the day / at the end of each day, the caretaker will be responsible for transferring the refuse from around various locations of the development and dispose directly to the refuse enclosure.
General Waste	▶ Bins / receptacles should always be lined with bags and tied before removal to the refuse enclosure. ▶ Waste should not exceed 3kg in weight or the dimensions of the receptacles. ▶ Waste bins should be accompanied by a recycling bin.
Commingled Recycling	▶ Items for recycling must not be bagged and disposed of in loose form. ▶ Bins should be accompanied by a waste bin.

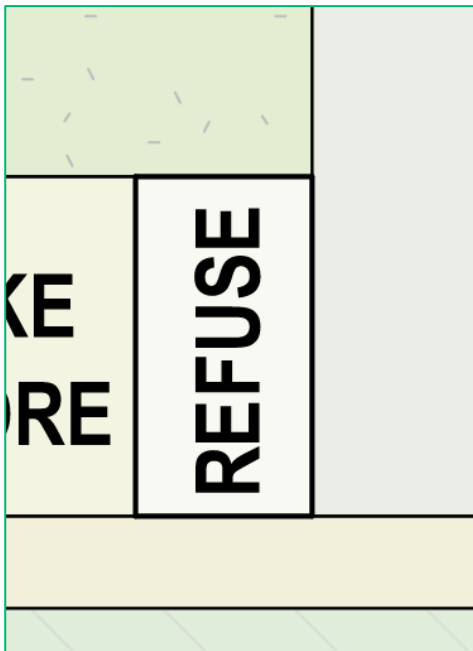
4.3 Refuse Storage

The proposed refuse enclosure arrangements are as follows:

- ▶ The refuse enclosure has been proposed to accommodate all required bins (3x 1500L bins).
- ▶ Bin wash facilities will be provided within or in close proximity to the refuse enclosure.
- ▶ The refuse enclosure is screened to improve amenity impacts (odour, amenity and noise).
- ▶ The servicing area is located within 5m of the refuse enclosure.

The configuration and size of the refuse enclosure is provided to ensure the bins are accessible to all required users. The refuse enclosure is adequately sized to include sufficient clearance between bins / walls and store all bins for collection, as shown in Figure 4-2. The recommended refuse enclosure design requirements are detailed in **Appendix C**.

Figure 4-2 School Refuse Enclosure



Source: Group GSA, drawing 2004 –Masterplan Stage 3 90%

4.4 Refuse Transfer

The proposed transfer arrangements for the site are as follows:

- ▶ Once a day or as required, the designated personnel (staff, cleaners and the caretaker) will be responsible for transferring all refuse from the receptacles and wheelie bins from around the development to the refuse enclosure.
- ▶ A bin lifter will be utilised to decant all 240L wheelie bins into the bulk bins.
- ▶ On the day of servicing, private contractors will be responsible for collecting bins directly from the refuse enclosure for collection, and return them once serviced.
- ▶ Bins will be transferred approximately 5m from the refuse enclosure to the servicing area, along a generally flat grade.

The recommended transfer requirements are detailed in **Appendix D**.

4.5 Servicing Arrangements

The proposed servicing provisions are as follows:

- ▶ All servicing will be conducted by a private contractor via a front-loading RCV.
- ▶ The RCV will enter and exit the site, from the new road, in a forward gear. The RCV will enter the site and conduct all manoeuvring on-site within the internal driveway.
- ▶ The RCV will stand onsite in an informal loading area with minimum dimensions of 3.5m (W) x 12m (L). Servicing will have an unrestricted height clearance and be conducted on a generally flat grade.
- ▶ The loading area is located approximately 5m from the refuse enclosure, with contractors to directly collect bins and return them once serviced.
- ▶ It is recommended that refuse servicing will be conducted outside of peak hours, to reduce any safety implications given the nature of the site and to allow for full utilisation of the parking layout for vehicle manoeuvring.
- ▶ Each stream will be serviced with a maximum collection frequency of three (3) times per week. All collections will be coordinated and managed onsite by the caretaker.

The recommended refuse enclosure design requirements are detailed in **Appendix D**.

4.6 Operational Management

The operational management and procedures can vary based on the operation of the site.

Appendix E details the minimum recommended arrangements for roles and responsibilities, maintenance and cleaning, training and education, safety, signage and monitoring and review. A blank table is also provided, to be completed by the appropriate personnel as required.

5 Childcare Refuse Arrangements

5.1 Refuse Generation

5.1.1 Refuse Calculations

The anticipated refuse to be generated by the proposed development may consist of the streams outlined in **Appendix B**.

It is noted that LCC does not provide any guidance on generation rates for a childcare. For the purpose of this assessment, Modus has applied generation rates from City of Sydney, adopted from Best Practice Guidelines. The calculations have been based on a 5 day per week operation, as outlined below in Table 5-1. Further to the above, only refuse generation areas have been assessed, and therefore the outdoor play areas have been excluded.

Table 5-1 Childcare Refuse Generation

Use	Generation Rate (L/100m ² /day)		GFA (m ²)	Generation (L/Week)	
	General Waste	Commingled Recycling		General Waste	Commingled Recycling
Childcare	65	50	318	1,034	795

The refuse volumes are considered to be conservative and may vary according to the operation of the development. As such, bin numbers and collection frequencies may need to be altered to suit the building operation once operational.

5.1.2 Bin Numbers

The required equipment for the development is based on the volumes calculated in Table 5-1. Additional waste management / minimisation equipment may vary depending on the operation of the development.

Table 5-2 shows the bin requirements (number & size) and area required to accommodate the bins.

Table 5-2 Childcare Bin Requirements

Description	Yield	General Waste	Commingled Recycling
Total	318m ²	1,034	795
Daily Volumes (L per day)		147.6	113.6
Collection Frequency (per week)		2	2
Collection Volumes (L per week)		516.8	397.5
Bin Size		240	240
No. Bins		3	2
Bin Area		2m ²	1m ²
Refuse Enclosure (Storage)		6.25m ² (2.5m x 2.5m)	
Required Frontage		5m	
Available Frontage		>5m	

5.1.3 Bins / Equipment

The refuse bins to be utilised for the proposed development is outlined below in Table 5-3.

Table 5-3 Childcare Refuse Bins

Type	Dimensions	Comments
80L-120L	559 x 279 x 635mm (L x W x H)	For all streams School to supply and position in various locations. Several options and sizes are available from numerous suppliers, depending on preference and space available.
240L	730 x 585 x 1060mm (L x W x H)	For all streams Generally supplied by Council or a private contractor prior to operation.

Depending on the operation of the development, additional refuse minimisation equipment and procedures can be implemented. Refuse minimisation and recommendations are detailed in Section 7.

5.2 Refuse Disposal

The typical refuse disposal arrangements is provided in Table 5-4.

Table 5-4 Childcare Refuse Disposal

Stream	Process
General Provisions (Waste and Recycling)	▶ Small bins / receptacles will be provided around various locations within the development, typically within back of house/staffroom areas, under kitchen sinks, bathrooms or in common areas. ▶ Once a day / as required, staff will dispose of their refuse to the appropriate receptacles / bins during the day. ▶ Staff will be responsible for transferring the refuse and disposing directly to the appropriate bins within the refuse enclosure.
General Waste	▶ Bins should always be lined with bags and tied before removal. ▶ Waste should not exceed 3kg in weight or the dimensions of the receptacles. ▶ Waste bins should be accompanied by a recycling bin.
Commingled Recycling	▶ Items for recycling must not be bagged and disposed in loose form. ▶ Recycling waste should not exceed 3kg in weight or the dimensions of the receptacles. ▶ Recycling bins should be accompanied by a general waste bin.

5.3 Refuse Storage

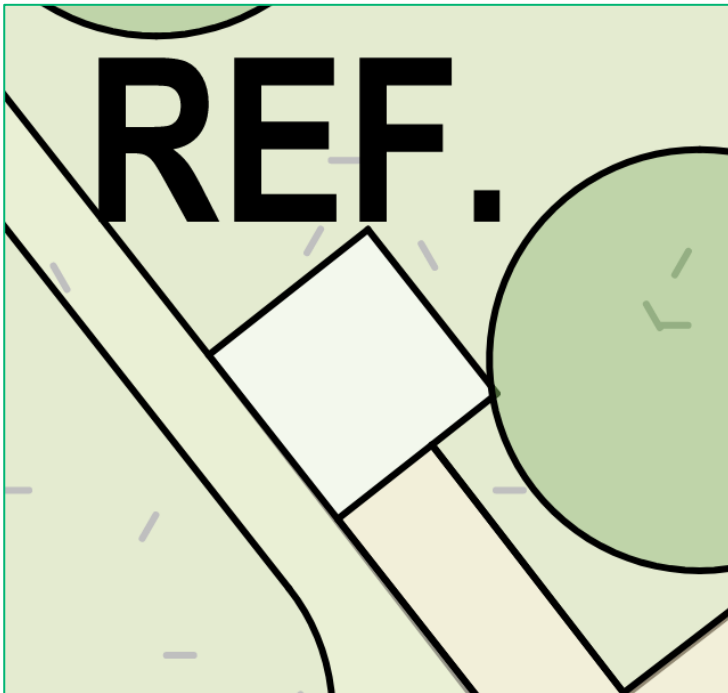
The proposed refuse enclosure arrangements are as follows:

- ▶ The refuse enclosure can accommodate all required bins (5x 240L bins).
- ▶ Bin wash facilities will be provided within or in close proximity to the refuse enclosure.
- ▶ The refuse enclosure is screened to improve amenity impacts (odour, amenity and noise).

The configuration and size of the refuse enclosure is provided to ensure the bins are accessible to all required users. The refuse enclosure is adequately sized to include sufficient clearance between bins / walls and store all bins for collection, as shown in Figure 5-1.

The recommended refuse enclosure design requirements are detailed in **Appendix C**.

Figure 5-1 Childcare Refuse Enclosure



Source: Group GSA, drawing 2004 –Masterplan Stage 3 90%

5.4 Refuse Transfer

The proposed transfer arrangements for the site are as follows:

- ▶ Once a day or as required, the designated staff/building management will be responsible for transferring all bins from the refuse enclosure to the kerbside for servicing.
- ▶ On the day of servicing, private contractors will be responsible for collecting bins directly from the kerbside, with staff/building management to return to the refuse enclosure once serviced.
- ▶ Bins will be transferred approximately 50m to the kerbside, along a generally flat grade.

The recommended transfer requirements are detailed in **Appendix D**.

5.5 Servicing Arrangements

The proposed servicing provisions are as follows:

- ▶ All servicing will be conducted on-street by a private contractor via a side-loading RCV.
- ▶ The RCV will temporarily stand on the site frontage for servicing. The arrangement will have unrestricted height clearance and be conducted on a generally flat grade.
- ▶ A minimum area of 0.9m x 0.9m per bin can be accommodated on the kerbside.
- ▶ It is recommended that refuse servicing will be conducted outside of peak road hours, to reduce any safety implications.
- ▶ Each stream will be serviced with a maximum collection frequency of two (2) times per week. All collections will be coordinated and managed onsite by the caretaker.

The recommended refuse room design requirements are detailed in **Appendix D**.

5.6 Operational Management

The operational management and procedures can vary based on the operation of the development.

Appendix E details the minimum recommended arrangements for roles and responsibilities, maintenance and cleaning, training and education, safety, signage and monitoring and review. A blank table is also provided, to be completed by the appropriate personnel as required.

6 Community Hub Refuse Arrangements

6.1 Refuse Generation

6.1.1 Refuse Calculations

The anticipated refuse to be generated by the proposed development may consist of the streams outlined in **Appendix B**.

It is noted that LCC does not provide any guidance on generation rates. Therefore, to assess the waste generation for the proposed site, Modus has applied the Brisbane City Council generation rates for an office/healthcare use as outlined below in Table 6-1. This generation rate is deemed sufficient for use as best practice, given the specific uses are applicable to the development. The calculations have been based on a 5-day per week operation for the site. Additionally, it is important to note that an assessment has been conducted for the total development once operational.

Table 6-1 Community Hub Refuse Generation

Use	Generation Rate (L/student/week)		Yield	Generation (L/Week)	
	General Waste	Commingled Recycling		General Waste	Commingled Recycling
Community / Healthcare	10	10	245m ² GFA	122.5	122.5

The refuse volumes are considered to be conservative and may vary according to the operation of the development. As such, bin numbers and collection frequencies may need to be altered to suit the building operation once operational.

6.1.2 Bin Numbers

The required equipment for the development is based on the volumes calculated in Table 6-1. Additional waste management / minimisation equipment may vary depending on the operation of the development.

Table 6-2 shows the bin requirements (number & size) and area required to accommodate the bins.

Table 6-2 community Hub Bin Requirements

Description	Yield	General Waste	Commingled Recycling
Total	245m ² GFA	123	123
Daily Volumes (L per day)		18	18
Collection Frequency (per week)		1	1
Collection Volumes (L per week)		123	123
Bin Size		240	240
No. Bins		1	1
Bin Area		1m ²	1m ²
Refuse Enclosure (Storage)	Area to be provided adjacent to Childcare Refuse Enclosure		
Required Frontage	2m		
Available Frontage	>2m		

6.1.3 Bins / Equipment

The refuse bins to be utilised for the proposed development is outlined below in Table 6-3.

Table 6-3 Community Hub Refuse Bins

Type	Dimensions (L x W x H)	Comments
80L-120L	559 x 279 x 635mm	For all streams Tenant to supply and position in various locations. Several options and sizes are available from numerous suppliers, depending on preference and space available.
240L	730 x 585 x 1060mm	For all streams Generally supplied by private contractors prior to operation.

Depending on the operation of the development, additional refuse minimisation equipment and procedures can be implemented. Refuse minimisation and recommendations are detailed in Section 7.

6.2 Refuse Disposal

The typical refuse disposal arrangements is provided in Table 6-4.

Table 6-4 Community Hub Refuse Disposal

Stream	Process
General Provisions (Waste and Recycling)	▶ Small bins / receptacles will be provided around various locations within the development, typically within back of house/staffroom areas, under kitchen sinks, bathrooms or in common areas. ▶ Once a day / as required, staff will dispose of their refuse to the appropriate receptacles / bins during the day. ▶ Staff will be responsible for transferring the refuse and disposing directly to the appropriate bins within the refuse enclosure.
General Waste	▶ Bins should always be lined with bags and tied before removal. ▶ Waste should not exceed 3kg in weight or the dimensions of the receptacles. ▶ Waste bins should be accompanied by a recycling bin.
Commingled Recycling	▶ Items for recycling must not be bagged and disposed in loose form. ▶ Recycling waste should not exceed 3kg in weight or the dimensions of the receptacles. ▶ Recycling bins should be accompanied by a general waste bin.

6.3 Refuse Storage

The proposed refuse enclosure arrangements are as follows:

- ▶ The refuse enclosure is to be provided to accommodate all required bins (2x 240L bins).
- ▶ Bin wash facilities will be provided within or in close proximity to the refuse enclosure.
- ▶ The refuse enclosure is to be screened to improve amenity impacts (odour, amenity and noise)

It is recommended that the configuration and size of the refuse enclosure is to ensure the bins are accessible to all required users. The refuse enclosure is to be adequately sized to include sufficient clearance between bins / walls and store all bins for collection.

The recommended refuse enclosure design requirements are detailed in **Appendix C**.

6.4 Refuse Transfer

The proposed transfer arrangements for the site are as follows:

- ▶ Once a day or as required, the designated staff/building management will be responsible for transferring all bins from the refuse enclosure to the kerbside for servicing.
- ▶ On the day of servicing, private contractors will be responsible for collecting bins directly from the kerbside, with staff/building management to return to the refuse enclosure once serviced.
- ▶ Bins will be transferred approximately 50m to the kerbside, along a generally flat grade.

The recommended transfer requirements are detailed in **Appendix D**.

6.5 Servicing Arrangements

The proposed servicing provisions are as follows:

- ▶ All servicing will be conducted on-street by a private contractor via a side-loading RCV.
- ▶ The RCV will temporarily stand on the site frontage for servicing. The arrangement will have unrestricted height clearance and be conducted on a generally flat grade.
- ▶ A minimum area of 0.9m x 0.9m per bin can be accommodated on the kerbside.
- ▶ It is recommended that refuse servicing will be conducted outside of peak road hours, to reduce any safety implications.
- ▶ Each stream will be serviced with a maximum collection frequency of once per week. All collections will be coordinated and managed onsite by the caretaker.

The recommended refuse enclosure design requirements are detailed in **Appendix D**.

6.6 Operational Management

The operational management and procedures can vary based on the operation of the development.

Appendix E details the minimum recommended arrangements for roles and responsibilities, maintenance and cleaning, training and education, safety, signage and monitoring and review. A blank table is also provided, to be completed by the appropriate personnel as required.

7 Refuse Minimisation

Refuse minimisation is an important part of any site operation and ensuring that diversion from landfill is minimised, to achieve the desired target rates as outlined in the QLD sustainability requirements.

To determine the feasibility of collection volumes and assist with achieving desired landfill diversion targets, it is recommended that a baseline audit is undertaken at various stages of building occupancy (i.e. 0-1 month, 1-3 months, 3-6 months, 6-12 months and yearly thereafter) by building management or an external contractor.

Based on the outcome of the audit, a management plan can be developed and implemented for continual improvement of the operational performance of the site and assist with implementation strategies.

7.1 Equipment

Minimisation systems are summarised in Table 7-1 and are presented as options only. To assess the feasibility, further investigation is required by the developer at the concept stage and/or building management at the operational stage. Additional refuse management equipment is detailed in Table 7-2. The equipment suppliers are further outlined in **Appendix F**.

Table 7-1 Refuse Minimisation Equipment

Type	Streams	Comments
Composter / digester	Food Waste	Compost bins / digestors can process compostable material and garden organics on-site. This reduces the volume of waste to landfill and converts organic materials into soil or mulch through natural decomposition. A variety of compost bin arrangements and systems are commercially available for use.
Waste Conversion	General waste	Converting waste by reducing its volume and weight means less material to be disposed of, which results in fewer RCV trips. This allows cost savings and reduces environmental impacts. An example of waste conversion is an OMPECO system, which converts waste into a sterilised, dehydrated material. The final product reduces up to 80% less volume and 50% less weight than the original waste material and can be used in waste to energy systems as it is reasonably dry with a high calorific value. The process involves crushing / grinding of the material and is heated to approximately 100°C, evaporating moisture from the material.
Compaction	General waste, cardboard, plastics	Various compaction equipment exists for reducing the volume of refuse and ultimately less bins and/or fewer collections / service vehicle trips are required, to reduce costs and environmental impact. Examples of typical waste compaction equipment include bin press equipment and public place litter bins with a built-in compaction mechanism.
Container deposit schemes	Eligible plastic / glass / aluminium bottles	Container deposit / refund schemes are currently in place in QLD. This includes bottle return facilities and (automated) reverse vending machines. Tenants, staff and cleaners should be encouraged to separate containers that qualify for the schemes from the waste or recycling streams, and return them to a designated return points. Dedicated storage space or bins should be provided within tenancies or communal areas.

Table 7-2 Refuse Management Equipment

Type	Streams	Comments
Refuse Trolley	General waste, recycling, food waste, paper / cardboard	Safety and mobility disposal can be assisted by trolleys for everyday use. Multi-purpose bin trolleys are used to transport bulky and awkward loads and are used widely in hospitals, laundries, manufacturing and warehouses.

7.2 Signage

Waste signage guidelines are provided by local and state government. Various signage for the refuse areas including safety and facility signage should be arranged through appropriate providers. Example signage for the site including refuse room and equipment, and safety signage is demonstrated in **Appendix G**.

8 Summary

Modus has been commissioned by GROUPGSA Pty Ltd to provide waste management advice in relation to a proposed Primary School development. Modus has the following findings:

Refuse Equipment

School

- ▶ 2 x 1500L general waste bins
- ▶ 1 x 1500L recycling bins
- ▶ Various 240L waste and recycling bins
- ▶ 1 x bin lifter

Childcare

- ▶ 3 x 240L general waste bins
- ▶ 2 x 240L recycling bins

Community Hub

- ▶ 1 x 240L general waste bin
- ▶ 1x 240L recycling bin

Refuse Disposal

- ▶ Each development will be provided with receptacles for storage of daily refuse volumes.
- ▶ Small bins / receptacles will be provided around various locations within the site.
- ▶ As required, staff will dispose of their refuse to the appropriate receptacles / bins during the day.
- ▶ Additionally, a bin lifter will be utilised for the school to decant the wheelie bins into the bulk bins for the school.
- ▶ Staff will collect the refuse once a day, or as required, and dispose directly to the wheelie bins for the childcare / hub and bulk bins for the school, within each refuse enclosure.

Refuse Storage

- ▶ All refuse enclosures can accommodate all required bins.
- ▶ Bin wash facilities will be provided within, or in close proximity to the refuse enclosures.
- ▶ The refuse enclosures are screened to improve amenity impacts (odour, amenity and noise).

Refuse Transfer

- ▶ Once a day or as required, the caretaker will be responsible for transferring all bins from around the school development to the refuse enclosure.
- ▶ Private contractors will be responsible for collecting bins directly from the refuse enclosure for the school and the kerbside for the childcare / hub, for collection and return once serviced.
- ▶ All bins will generally be transferred along a generally flat grade.

Refuse Servicing

School

- ▶ All servicing will be conducted by a private contractor via a front-loading RCV.
- ▶ The RCV will enter and exit the site, from the new road, in a forward gear. The RCV will enter the site and conduct all manoeuvring on-site within the internal driveway.
- ▶ The RCV will stand onsite in an informal loading area with minimum dimensions of 3.5m (W) x 12m (L). Servicing will have an unrestricted height clearance and be conducted on a generally flat grade.
- ▶ The loading area is located approximately 5m from the refuse enclosure, with contractors to directly collect bins and return them once serviced.
- ▶ Each stream will be serviced with a maximum collection frequency of three (3) times per week.

Childcare

- ▶ All servicing will be conducted on-street by a private contractor via a side-loading RCV.
- ▶ The RCV will temporarily stand on the site frontage for servicing. The arrangement will have unrestricted height clearance and be conducted on a generally flat grade.
- ▶ A minimum area of 0.9m x 0.9m per bin can be accommodated on the kerbside.
- ▶ Each stream will be serviced with a maximum collection frequency of two (2) times per week.

Community Hub

- ▶ All servicing will be conducted on-street by a private contractor via a side-loading RCV.
- ▶ The RCV will temporarily stand on the site frontage for servicing. The arrangement will have unrestricted height clearance and be conducted on a generally flat grade.
- ▶ A minimum area of 0.9m x 0.9m per bin can be accommodated on the kerbside.
- ▶ Each stream will be serviced with a maximum collection frequency of once per week.

APPENDIX A - Development Plans



PRELIMINARY

Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Client
PC BUNDLE - GREATER FLAGSTONE SS
Client Details



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T +617 3112 3079
architecture interior design urban design landscape
nom architect Lisa-Maree Carrigan 5696
Project Title

GREATER FLAGSTONE
STATE SCHOOL

Drawing Title

MASTERPLAN 90%

Scale		1 : 1000
Drawing Created (date)		
Drawing Created (by)		
Plotted and checked by		Designer
Verified		Checker
Approved		Approver
Project No	Drawing No	Issue

A252250 2001

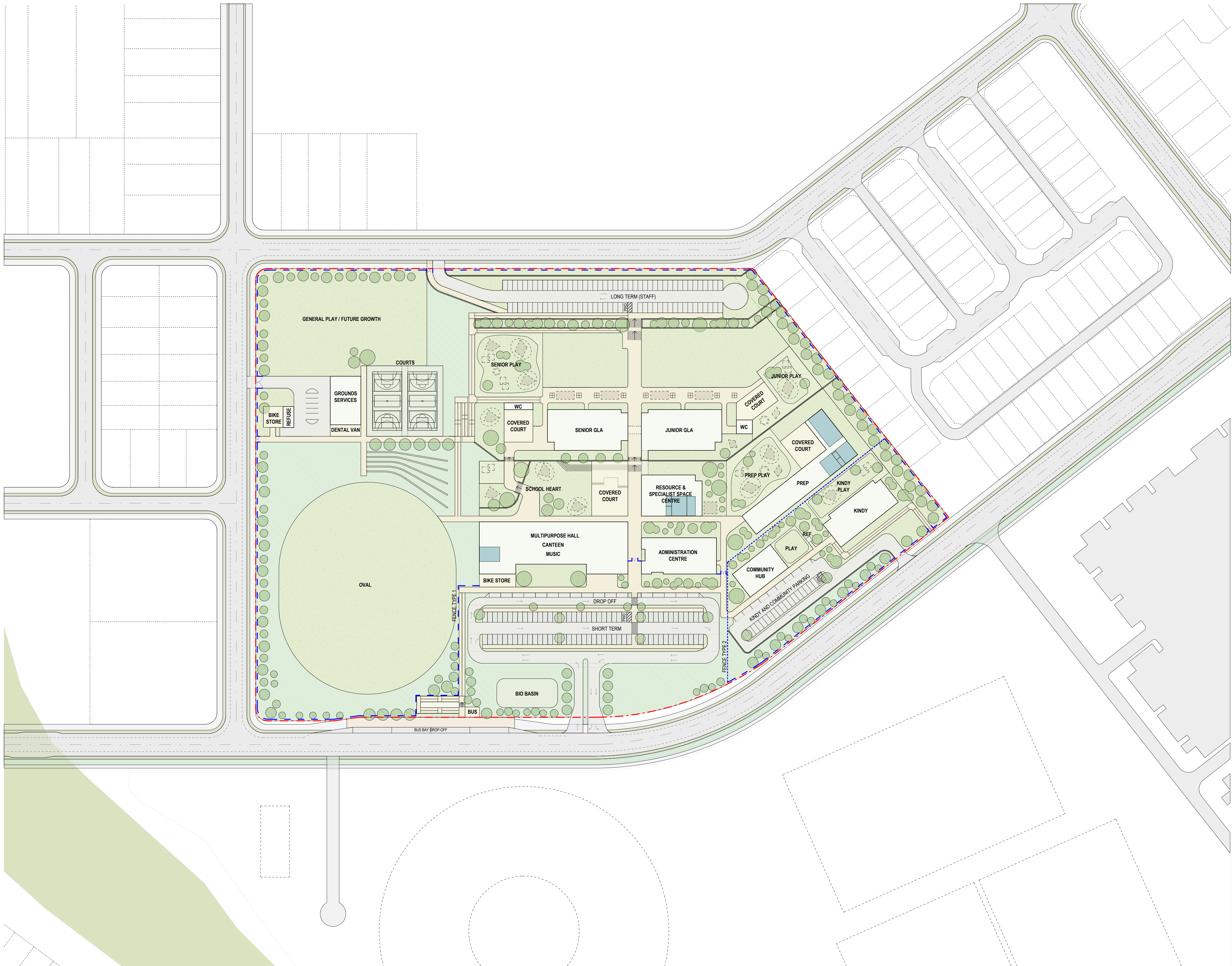
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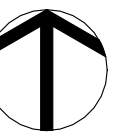
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Amendments		Date
Issue	Description	



PRELIMINARY

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Consultant Details
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Consultant Company
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Client
PC BUNDLE - GREATER FLAGSTONE SS
Client Details



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Project Title

GREATER FLAGSTONE STATE SCHOOL

MASTERPLAN - STAGE 1 90%

Scale		1 : 1000
Drawing Created (date)		
Drawing Created (by)		
Plotted and checked by		Designer
Verified		Checker
Approved		Approver
Project No	Drawing No	Issue

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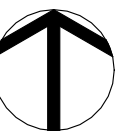
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Amendments		
Issue	Description	Date



PRELIMINARY

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Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Client
PC BUNDLE - GREATER FLAGSTONE SS
Client Details



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GREATER FLAGSTONE
STATE SCHOOL

MASTERPLAN - STAGE 2
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Scale	1 : 1000	
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Plotted and checked by	Designer	
Verified	Checker	
Approved	Approver	
Project No	Drawing No	Issue

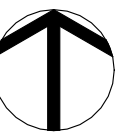
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Amendments		
Issue	Description	Date



PRELIMINARY

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Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Consultant
Consultant Company
Consultant Details
Client
PC BUNDLE - GREATER FLAGSTONE SS
Client Details



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GREATER FLAGSTONE STATE SCHOOL

Drawing Title
**MASTERPLAN - STAGE 3
90%**

Scale 1 : 1000

Drawing Created (date)

Drawing Created (by)

Plotted and checked by Designer

Verified Checker

Approved Approver

Project No Drawing No Issue

A252250 2004

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1 OVERALL 90% MASTERPLAN STAGE 3

1 : 1000

APPENDIX B – Proposed Refuse Streams

Stream		Description
Frequently Generated		
General Waste	General Waste, Food Waste	General waste items are non-recyclable and can be putrescible (organic matter which can break down) or non-putrescible (non-organic matter which cannot break down).
Commingled Recycling	Semi-rigid plastics, glass, aluminium, steel / tin cans, glass	Commingled recycling includes everyday items that are collected and later processed for recycling into new products and resources. Recycling separation diverts waste to landfill.
Infrequently Generated		
Green Waste	Landscaping, trees, potted plants	This development does not generally produce green waste (other than landscaping). Maintenance contractors are typically engaged to remove material and should be directed to send to a resource recovery / composting facility to avoid landfill.
Hard Waste / Bulky Goods	Furniture, white goods, appliances etc	Storage and collection should be coordinated with designated staff. Where available, space can be provided in the refuse storage area or within a designated area. When transferring heavy material, it is recommended to utilise assisted transfer such as pallet jacks or forklifts. Please refer to local and QLD government websites for further information.
Hazardous Waste	Paints, fluorescent globes, mobiles, batteries and cartridges Electronic Waste (computers, printers, TV's)	Storage and collection should be coordinated with building management or designated staff, and handled with care. Space should be provided in a secure and separate area. Refer to local and state government websites for further information.

APPENDIX C – Refuse Room Design Requirements

Component	General Requirement
Refuse Enclosure / Storage point	▶ Allow the bins to be serviced in-situ or easily transported to a separate servicing point (no steps or lips on bin-carting route). ▶ Waste-carting distance generally should not exceed 60m and in any case be reasonable to ensure ease of use. ▶ Generally positioned away from entrances to shops premises and located at least 5m from any door, window or fresh air intake within the development (habitable rooms) or any adjoining site (excluding the storage of wheelie bins at each individual dwelling), particularly food preparation areas (including food storage). ▶ Screened to ensure bins are not visible from a public place or sensitive land use. ▶ Safe access to the disposal area. ▶ Of sufficient size to accommodate the required number of bins. Allowance is to be made for a minimum of 0.1m clearance surrounding each container, or for the storage of multiple bins – one metre clearance around the combined bin area (whichever is the lesser). ▶ Provide adequate storage and unobstructed access for all users to safely and easily access via the provision of suitably located bulk bins or wheelie bins. ▶ The floors, walls and ceilings of waste and recycling storage areas are to be finished with a rigid, smooth-faced impermeable material capable of being easily cleaned. ▶ Is enclosed on all sides except for the gated entrance to ensure bins are not visible from a public place, neighbouring properties, passing vehicles or pedestrian traffic external to the site. A close-fitting and self-closing door or gate operable from within the room is to be fitted to all waste and recycling storage areas. ▶ Doors/gates to the waste and recycling storage rooms are to provide a minimum clearance width of 1.3m. At least one door or gate to the waste and recycling storage area is to have sufficient dimensions to allow the entry and exit of waste containers of a capacity nominated for the development. ▶ The height of the bin storage area to be a minimum of 2.1m in accordance with the National Construction Code and Building Code of Australia, to allow for waste bins to be opened and closed. ▶ Lightweight roller shutter-type doors or grilles should be considered for access to waste and recycling storage areas, as these do not impact on the available storage space. If these types of doors or grilles are used, the requirement for a close-fitting and self-closing door remains, so that waste collectors can access the waste and recycling storage area other than through the roller door or grille. Where required, the refuse room is to be fire rated in accordance with the National Construction Code and Building Code of Australia. ▶ The design shall restrict the entry of trespassers, vermin or other animals into the area. ▶ The waste and recycling storage area is to be provided with an adequate supply of water for cleaning purposes with a hose cock. ▶ The storage area is to be adequately ventilated by either: i. Natural ventilation openings to external air. The dimension of the openings are not to be less than 5% of the bin bay or bin room floor area.

	ii. A mechanical exhaust ventilation system in accordance with relevant Australian standards. ▶ Waste and recycling areas are to be provided with artificial light controlled by switches located both outside and inside the storage area. ▶ Any compactors or mechanical devices, if permitted for the mechanical handling and storage of waste and recycling, are to be fitted with safety operating and cut-off systems. ▶ Any facet of the waste and recycling management system that is visible from outside the building is to be in keeping with the dominant design of the remainder of the development.
Bin wash-down facility	▶ Constructed hardstand area with a solid concrete base or acceptable equivalent. ▶ Roofed and designed to prevent entry to rainwater. ▶ The floors are graded to fall to a drainage point. The floor is to be provided with a ramp to the doorway where necessary. ▶ Drainage point connected to sewer in accordance with trade waste requirements. ▶ Provided with a hosecock for cleaning. ▶ Not be located within a building structure, unless it is: i. in a purpose-built storage area which is air locked, fly and vermin proofed, and used solely for the storage of waste; ii. in a well-ventilated portion of the basement and not within 30m of an opening to a food premises or food handling area; or iii. demonstrated that no / minimal putrescible / organic waste is generated by the proposed development type.

APPENDIX D - Servicing Requirements

Component	General Requirement
Bin servicing point	▶ Is of sufficient size to accommodate the bins. ▶ Sufficient access and clearance for the collection vehicles to service the bins, including adequate unobstructed overhead space for the swinging arm action of the collection vehicle. ▶ Bins serviced safely while minimising the impediment of traffic flow during servicing. ▶ Separated from car parking bays, loading bays, footpaths and pedestrian access, and any other similar areas. ▶ Clear of speed control devices or similar provisions (including entry and exit to the site) which inhibit direct access to the bins for servicing. ▶ Must be positioned to allow collection vehicles to enter and exit the site in a forward gear (internal servicing roadway). ▶ Positioned on a level pad devoid of stairs, lips or ramps and allows bins to be manoeuvred easily. ▶ Over 5m from any door, window or fresh air intake within the development (habitable rooms) or any adjoining site (excluding the storage of wheelie bins at each individual dwelling), particularly food preparation areas (including food storage). ▶ Bins to be removed from and returned to the storage point. ▶ Constructed hardstand with a solid concrete base or acceptable equivalent. ▶ Allow for at least an additional 0.5m clearance surrounding each container, or for multiple bins, a minimum of 0.3m between each side of the bins and any barrier around the location. An individual bin should be accessible via bin rotation within the area. The height of the servicing area must allow for waste bins to be opened and closed. ▶ Screened to minimise the view of bins from neighbouring properties, or passing vehicles and pedestrian traffic external to the site. ▶ Positioned away from entrances to shops or residential premises.
Bin carting	▶ The route must be via hard stand pathways / internal roads, and can be easily moved to the temporary storage area, and is not stored on a section of the driveway that falls away (e.g. to the basement). The route must occur within the property boundary. ▶ The route must allow bins to be easily manoeuvred and be devoid of steps or steep rises. ▶ The route must not impede traffic flow and extend through habitable parts of a building, or a food premises, and only occur through common property or publicly accessible locations.

APPENDIX E – Operational Management

Process	Procedure
Roles and Responsibilities	Responsibilities have to be assigned for all on-going refuse management operations. This is generally completed by a building manager, staff and / or cleaners. The on-going responsibilities help managing responsibilities and monitor the refuse operations in order to maintain efficient services and a safe environment. These include and are not limited to the following: ▶ Scheduling / organising refuse collections ▶ Transferring bins to and from the refuse area ▶ Washing bins ▶ Ensuring users / occupants are informed of all waste, recycling, organics and bulky waste arrangements ▶ Coordination of contractors, including specialised equipment and cleaning ▶ Monitoring and reviewing all waste management procedures
Maintenance and Cleaning	Regular on-going maintenance and cleaning is required to maintain a clean and hygienic environment for all users, including management / staff, visitors and contractors. This includes, and is not limited to the following: ▶ Refuse storage areas ▶ Refuse transfer areas ▶ Refuse equipment
Training and Education	Training and education is required to ensure operational efficiency and sustainability of the equipment and facilities within the development. Training and on-going education should be conditioned within all body corporate and leasing contracts. It is recommended that building management circulate ongoing recycling rate results to highlight current rate and performance against benchmarked recycling rate target.
Safety	Safety is an important part of all refuse management operations and is the responsibility of all users. A full risk assessment should be conducted by building management and all contractors. Contractors must provide required documentation to appropriate personnel prior to development occupancy and delivery of equipment.
Signage	All receptacles, bins and other refuse management equipment must have adequate signage. Standard signage will be provided in and around waste collection / storage areas and will be colour coded in accordance with AS 4123.7-2006 mobile waste containers and all local government regulations. Signage should be included, and not limited to the following: ▶ Refuse storage and collections areas ▶ Refuse transfer areas ▶ Refuse disposal points ▶ Refuse equipment All signage should be clear, legible and easy to read.
Monitoring and Review	Regular monitoring and reviews will ensure operational efficiency and sustainability of the refuse management arrangements for the development. This includes, and is not limited to the following: ▶ Refuse equipment ▶ Refuse area ▶ Refuse volumes, including diversion rates and targets to meet the required sustainability targets ▶ Service frequency and site operations / methodologies It is recommended that waste auditing / reviews are conducted a minimum of at least once every 12 months. Audits may be undertaken by external contractor or internally by visual inspection during on-site waste management handling activities. Additionally, refuse weights and movements should be noted to assist with economic feasibility.

A blank operational checklist is provided below to be appropriately filled out as required by building management / staff. This table has been designed to maintain efficient services and a safe environment and help manage responsibilities / monitor the refuse operations.

[illegible]

APPENDIX F – Equipment / Systems Manufacturers and Suppliers

Manufacturer / Supplier	Equipment / Systems
Waste Initiatives https://wasteinitiatives.com.au	Compactors and Balers, Shredders, Sorting Equipment
Wastech http://wastech.com.au	Compactors, Bin Lifters
Pakmor http://pakmor.com.au	Compactors, Bin Lifters
Closed Loop Organics https://closedloop.com.au/upcycling-products	Composting
Materials Handling https://www.materialshandling.com.au	Bin Lifters, Spill containment, Bins, Bin Cleaning
Spacepac Solutions http://www.spacepac.com.au	Bin tugs / trailers, trolleys / assisted transfer equipment
Draffin https://draffin.com.au	Bin lifters
Electrodrive / Lift Master http://www.electrodrive.com.au	Bin tugs / trailers, bin lifters
Absorbenviro http://www.absorbenviro.com.au	Spill containment equipment
Trade Environmental http://www.tradeenviro.com.au	Spill containment equipment
Spillstationaustralia www.spillstation.com.au	Spill containment equipment
Compost Revolution https://compostrevolution.com.au	Composting
Urban Composter https://www.urbancomposter.com.au	Composting
ORCA Digester https://www.feedtheorca.com	Composting
Rubbermaid https://rubbermaidcommercial.com.au/products/waste-management	trolleys / assisted transfer equipment, spill containment, bins
Sulo http://www.sulo.com.au	trolleys / assisted transfer equipment, bins, composting
Australian Waste Management https://www.australianwastemanagement.com.au/products	Bin lifters, bins
ReturnIT https://www.returnit.com.au/qld/	Various models exist including bottle return facilities and (automated) reverse vending machines

APPENDIX G – Example Signage

Standard Signage



Refuse Room / Facility Signage



Safety Signage



Refuse Equipment

