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Waste Management Input for Environmental Impact Statement (EIS)

Southern Suburbs Cluster – New Liverpool Primary School

Report for School Infrastructure NSW

Waste Management Input for EIS

School Infrastructure NSW

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Contents

| | |
|---|-----------|
| Important note about your report | 5 |
| 1. Background..... | 6 |
| 1.1 Objective and Scope | 7 |
| 1.2 Assessment Methodology | 7 |
| 1.3 SEARS Checklist | 7 |
| 2. Overview of development | 8 |
| 3. Legislative and Guidance Information | 9 |
| 4. Construction Waste Management..... | 11 |
| 4.1 Waste Volume Targets Construction | 12 |
| 4.2 Waste Avoidance and Reuse Measures During Demolition and Construction..... | 13 |
| 4.3 Submission Requirements for Construction Works | 13 |
| 5. Operational Waste Management | 14 |
| 5.1 Waste Generation | 14 |
| 5.2 Waste storage area..... | 15 |
| 5.3 Specification for Waste Storage..... | 16 |
| 5.4 Waste Transfer..... | 16 |
| 5.5 Access..... | 17 |
| 5.5.1 Staff Access during operations | 17 |
| 5.5.2 Vehicle Access for collection..... | 17 |
| 5.5.3 Signage | 17 |
| 6. Conclusion | 19 |

Glossary

| Abbreviation | Definition |
|--------------|---|
| AS | Australian Standards |
| BCA | Building Code of Australia |
| C&D | Construction and Demolition |
| C&I | Commercial and Industrial |
| CWMP | Construction Waste Management Plan |
| DCP | The Liverpool Development Control Plan 2018 |
| EIS | Environmental Impact Statement |
| GBCA | Green Building Council of Australia |
| GFA | Gross Floor Area |
| NLPS | New Liverpool Primary School |
| NSW EPA | New South Wales Environment Protection Authority |
| POEO | Protection of the Environment Operations Act 1997 |
| WARR | Waste Avoidance and Resource Recovery |
| WMP | Waste Management Plan |

Important note about your report

The sole purpose of this Report and the associated services performed by Ricardo Energy, Environment and Planning (Ricardo) is to identify a suitable waste management solution for the School Infrastructure NSW development in accordance with the scope of services set out in the contract between Ricardo and School Infrastructure NSW.

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1. Background

Ricardo has been engaged by School Infrastructure NSW to prepare a Waste Management Statement for the Environmental Impact Statement (EIS) for the development of NLPS.

The new Liverpool Primary School (NLPS) is located within the grounds of the existing Liverpool Boys and Girls High Schools in the Liverpool Central Business District (CBD), at 18 Forbes Street, Liverpool. The proposed new Liverpool Primary School is located in the eastern portion of the existing school grounds (refer to **Figure 1**).

The site is legally described as Lot 1 in DP 1137425. The application seeks consent for the construction and operation of a new Liverpool Primary School. This will include construction of a new school building for core school facilities, teaching spaces, support units, preschool as well as associated landscaping and open space improvements. A detailed description of development is provided by Ethos Urban within the EIS.

Figure 1: NLPS Site Plan



The development of an EIS is in response to the Planning Secretary's Environmental Assessment Requirements (SEARs) number SSD-10391 for the development of NLPS which includes:

- Construction of a new school building of up to four storeys including core school facilities, teaching spaces and support units;
- Associated site landscaping and open space requirements
- Removal of trees; and;
- School signage.

The site is well-located to manage waste as there is ample provision within the metropolitan area to waste processors to reuse and recycle materials, and if required, dispose of restricted and controlled waste. This report describes the resources and materials, including potential sources and the expected quantities of waste that would be generated in the construction and operation of the project.

1.1 Objective and Scope

The objective of this assessment is to outline operation and construction waste generation estimates, storage and mitigation measures relevant to the development works. Specifically, these are:

- The construction and operation of the main school building and hall.
- Waste generation from earthworks and landscaping works of outdoor play areas.
- Construction and operation of pump room, tanks and bin enclosure.
- Construction of new fencing.
- Construction of carparks.

1.2 Assessment Methodology

The assessment of resource use and waste management comprised:

- Review of the likely resources required for the construction and operation of the project.
- Review of the likely waste streams, volumes and classifications.
- Identification of opportunities for the avoidance, minimisation and reuse of wastes.
- Identification of the environmental impacts associated with resource use and the generation (and subsequent disposal) of residual waste materials.
- Management strategies for waste during construction and operation, including managing construction and operation waste through the resource management hierarchy established under the Waste Avoidance and Recovery Act 2001

1.3 SEARS Checklist

Table 1 below lists the Planning Secretary's Environmental Assessment Requirements (SSD-10391) for waste issues for the proposed development, and how they have been addressed.

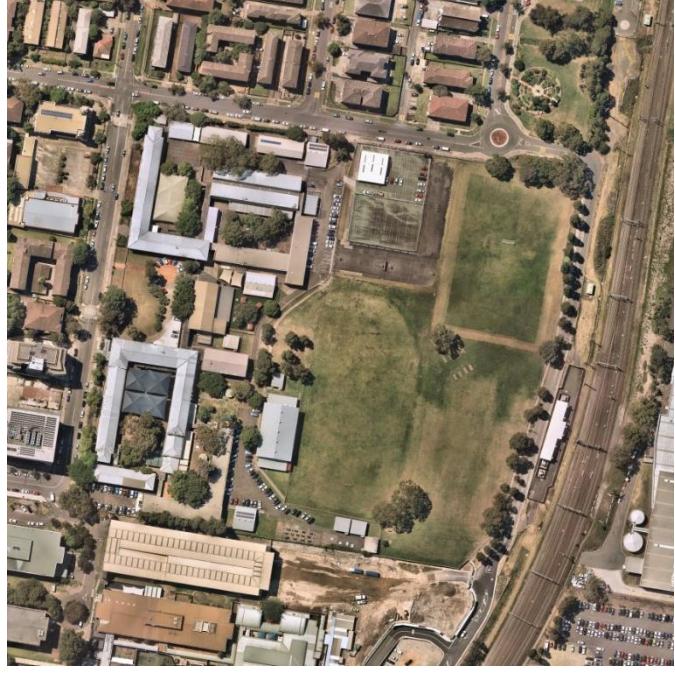
Table 1 SEARS Requirements

| SEARS Requirement | Comment |
|---|---|
| Identify, quantify and classify the likely waste streams to be generated during construction and operation. | Construction and operational waste types have been identified and classified according to the Waste Classification Guidelines in Section 4. Construction and operational waste generation estimates have been calculated based on industry benchmarks in Sections 4.1 and 5.1. |
| Describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site. | Reuse, recycling and disposal methods for each construction waste type have been listed in Section 4. Operational waste bin requirements and disposal procedures have been listed in Sections 5.2, 5.3, 5.4, and 5.5. |

2. Overview of development

The site is currently a part of two existing active schools that will continue to operate throughout the development of NLPS. Details of the site to be developed are detailed in **Table 2**.

Table 2 Site Details

| Site details | | Map |
|-----------------------|--|--|
| Site address | 18 Forbes Street, Liverpool NSW 2170 | |
| Local Government Area | Liverpool City Council | |
| Applicant's name | School Infrastructure NSW | |
| Existing buildings | Liverpool Boys High School and Liverpool Girls High School |  Source: nearmap |

3. Legislative and Guidance Information

Waste legislation and guidance applicable to the development is outlined in **Table 3**.

Table 3 Legislative Guidance

| Name of Legislation/ Guidance | Authority | Notes |
|---|--|--|
| Protection of the Environment Operations (POEO) Act 1997 & Amendment Act 2011 | NSW EPA | The POEO Act enables the Government to establish legislative instruments and regulation for setting environmental standards, goals, protocols and guidelines. |
| POEO (Waste) Regulation 2014 | NSW EPA | The Waste Regulation sets out legislation relating to the waste levy in NSW, waste tracking and management requirements for dangerous goods / hazardous wastes, resource recovery exemptions, and pollution offences. |
| Waste Classification Guidelines (Part 1) 2014 | NSW EPA | The Guidelines provide information on how to classify, manage, treat and dispose of different classifications of waste to ensure risks to the environment and human health due to inappropriate management of waste are minimised. |
| Waste Avoidance and Resource Recovery (WARR) Act 2001 | NSW Environment Protection Authority (EPA) | The WARR Act promotes extended producer responsibility of waste and resources through minimised consumption of natural resources, efficient use of natural resources, and minimised disposal of waste through waste avoidance, reuse and recycling. It promotes industry and community participation and responsibility for reducing and managing waste |
| Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021 | NSW EPA | The WARR Strategy outlines the State Government's long-term targets for waste avoidance, resource recovery, and litter and illegal dumping for the domestic, construction and demolition, commercial and industrial sectors which are necessary for the environmental and economic future of the State. |
| Better Practice Guideline for Waste Management in Commercial and Industrial (C&I) Facilities 2012 | NSW EPA | The Guidelines have been generated as a handy reference and resource for contractors, architects, designers, consultants, developers, building owners and managers. |
| Building Code of Australia (BCA) | Australian Building Codes Board | The BCA have the aim of achieving nationally consistent and minimum standards of relevant health and safety, amenity and sustainability objectives. The BCA is a set of technical provisions for the design and construction of buildings and other structures. |
| Relevant Australian Standards (AS) | Standards Australia | The Standards are specifications, procedures and guidelines which ensure products, services and systems are safe, reliable and consistent. Australian Standards which apply to waste management include AS 2890.2 (parking facilities for off-street commercial vehicles), AS1319 (safety signs) and AS4123.7-2006 (mobile waste containers and colour coding requirements). |

The Liverpool Development Control Plan 2018 (DCP) – Part 1 General Controls for all Development, provides detailed planning and design guidelines to support the planning controls in the Liverpool Local Environment Plan 2008 (LEP). The DCP provides objectives and development controls that

establish clear guidelines for development and protection of the environment including waste management.

The waste management objectives of the DCP are:

1. To minimise waste produced during demolition and construction of new development and maximise resource recovery.
2. To ensure waste management for the end use of the development is designed to provide satisfactory amenity for occupants and provide appropriately designed collection systems.
3. To minimise ongoing waste to landfill and maximise recycling of ongoing waste.

A summary of the relevant controls for the construction and operation of NLPS is presented in **Table 4** below. These controls will assist in managing the environmental impact of waste generation at the site. For further detail, refer to the DCP at <https://www.liverpool.nsw.gov.au/development/liverpools-planning-controls/liverpool-development-control-plan>.

Table 4 Liverpool DCP Waste Related Controls

| Controls | Summary |
|---------------------------------------|--|
| Non-residential development | <ul style="list-style-type: none">• The development application must be accompanied by a waste management plan that addresses:<ul style="list-style-type: none">◦ Best practice recycling and reuse of construction materials◦ Use of sustainable building materials◦ handling methods and location of waste storage areas, and◦ procedures for the on-going sustainable management of green and putrescible waste, garbage, glass, containers and paper |
| Waste Management Plan | <ul style="list-style-type: none">• A Waste Management Plan (WMP) must be submitted with a Development Application for any construction and operational activities generating waste. |
| Waste Management Facilities | <ul style="list-style-type: none">• A hose cock for hosing the garbage bin bay and a seweraged drainage point are to be provided in or adjacent to the bin storage area.• Responsibility for cleaning waste storage areas and frequency of cleaning must be indicated in the WMP• Sufficient space must be allocated within the bin bay to allow for access to all bins and manoeuvring of bins• The agreed number of bins that will require storage are given as a consent condition |
| Access to waste and recycling storage | <ul style="list-style-type: none">• Bin bays are to be adjacent to a street frontage, or if not possible then at a designated point adjacent to the common access driveway provided sufficient level areas (<5% grade) is available for bin collection to be carried out, away from vehicle ramps and steps.• The bin bay is to be located so that distance from bin bay to the nearest waste collection point accessible by the collection vehicle is no further than 15m.• The bin bay shall be positioned so as to minimise noise impacts on residents from the usage of bins and waste or recycling collection.• Suitable arrangements for transfer of any interim storage to the main bin bay are to be indicated in the WMP. |

4. Construction Waste Management

At this stage of the development, School Infrastructure NSW has not yet decided upon a construction contractor for detailed planning of construction waste management. A detailed Construction Waste Management Plan (CWMP) outlining the management of wastes during the construction works will be provided by the construction contractor once appointed.

The CWMP will outline how the construction contractor will maximise resource recovery and minimise residual waste from construction activities. In completing the CWMP the Construction contractor will:

- Estimate volumes of materials to be used and incorporate these volumes into a purchasing policy so that the correct quantities are purchased.
- Identify potential reuse/recycling opportunities of excess construction materials.
- Incorporate the use of prefabricated components and recycled materials.
- Arrange for the delivery of materials so that materials are delivered 'as needed' to prevent the degradation of materials through weathering and moisture damage.
- Consider organising the return of excess materials to the supplier or manufacturer.
- Allocate an area for the storage of materials for use, recycling and disposal (considering slope, drainage, location of waterways, stormwater outlets and vegetation).
- Arrange contractors for the transport, processing and disposal of waste and recycling.
- Ensure that all contractors are aware of the legal requirements for disposing of waste.
- Promote separate collection bins or areas for the storage of residual waste.
- Clearly 'signpost' the purpose and content of the bins and storage areas.
- Implement measures to prevent damage by the elements, odour and health risks, and windborne litter.
- Minimise site disturbance and limit unnecessary excavation.
- Ensure that all waste is transported to a place that can lawfully be used as a waste facility.
- Retain all records demonstrating lawful disposal of waste and keep them readily accessible for inspection by regulatory authorities such as Council, NSW EPA or WorkCover NSW.

The CWMP will detail construction design measures including:

- how measures for waste avoidance have been incorporated into the design, material purchasing and construction techniques for development for lifecycle and materials.

The site plans submitted along with the CWMP, prior to construction, will also detail the following during construction activities:

- Size and location(s) of waste storage area(s)
- Access for waste collection vehicles
- Areas to be excavated
- Types and numbers of storage bins likely to be required
- Signage required to facilitate correct use of storage facilities

The likely materials generated during the construction phase of the upgrade and an identified method for reuse, recycling and disposal are outlined in **Table 5**.

Table 5 Construction Waste Sources (indicative only)

| Waste Type | Typical Method for Reuse, Recycling or Disposal |
|--|--|
| Concrete | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Brick | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Asphalt | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Metals | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Timber (Treated and untreated) | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Plasterboard | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Glass | Keep separate to reuse on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. |
| Virgin excavated natural material (VENM)/ Excavated natural material (ENM) | Risk assess material for contamination, reuse on site where possible, or dispose to landfill. |
| Garden waste | Keep separate to send offsite for organics recovery such as composting or mulching. |
| Other general solid waste (putrescible or non-putrescible) | Separate into inert recyclable waste and unrecyclable landfill waste. Reuse inert recyclable waste on site where possible. Otherwise collect with other inert waste in skip bin to be sent offsite to C&D waste processor. Dispose inseparable or unrecyclable waste to landfill |

4.1 Waste Volume Targets Construction

Construction and demolition waste represents a significant proportion of waste that is sent to landfill. To reduce the amount of waste sent to landfill from construction and demolition works, the Green Building Council of Australia (GBCA) established a maximum benchmark of 17.5 kg of waste per square metre of gross floor area (GFA), for the total amount of waste to be sent to landfill for a construction and demolition project. This represents normal industry practice and best practice waste management is expected to generate substantially less than this amount.

Based on the preliminary plans for the development works, the approximate floor area which will be developed is 11,045 m². This will generate up to approximately 193 tonnes of landfill material if working to the GBCA benchmark.

In addition to the principal construction works of the main school building and hall, the following construction activities may also generate waste during the construction works:

- Landscaping and construction of outdoor play areas
 - VENM/ENM
 - Timber
 - Garden waste
- Construction of carparks
 - Concrete
 - Asphalt

- VENM/ENM
- Pump room, tanks and bin enclosures
 - Assumed to be incorporated with principal construction waste estimates in **Table 5**
- Fencing
 - Metals

4.2 Waste Avoidance and Reuse Measures During Demolition and Construction

The following measures will be investigated and implemented (where economically feasible) to work towards maximising resource recovery and minimise residual waste from construction activities:

- Formwork (temporary or permanent moulds) will be reused where possible.
- Appropriate sorting and segregation of wastes will be undertaken to ensure efficient reuse and recycling of materials throughout construction and demolition activities.
- Site disturbance will be minimised to limit unnecessary excavation and excavated material will be reused on site where possible.
- Green waste (i.e., garden organics) will be reprocessed offsite.
- Construction materials will be selected taking into consideration their long lifespan and potential for reuse at the end of their initial use.
- Pre-cut and prefabricated materials will be carefully ordered to size, and prefabricated components will be used for internal fit outs where possible.
- Materials will be delivered on an 'as needed' basis to prevent degradation of materials through weathering and moisture damage.
- Materials, including reuse and recycling materials, will be stored and kept in good condition.
- Trade work on site will be coordinated and appropriately sequenced to increase efficiency and reduce waste materials.
- Packaging waste will be reduced by the return of packaging to suppliers where possible, use of returnable bulk packaging, through bulk purchasing and requesting cardboard or metal drums, and metal straps, in place of plastics that cannot be recycled.
- Staff/subcontractors will be informed of waste and resource management procedures and resource recovery targets.
- Contractors will be made aware of the legal requirements for disposing of waste in NSW.
- Contracts will include measures which reinforce the requirement to sort wastes effectively for reuse and recycling.

4.3 Submission Requirements for Construction Works

At the time of reporting, a Building Contractor has not been decided upon for detailed planning of construction waste and resource management. It is expected that the Building Contractor will ensure that the construction waste management plan is in accordance with this document. The Principal will approve any waste management plans prior to commencement of the project.

The construction contractor will complete all aspects of the CWMP relating to construction waste management including:

- The Volume of Waste Table for Construction to be completed with construction certificate
- Construction Design requirements
- Submit site drawings to scale, clearly indicating the location of and provisions for the storage and collection of waste and recyclables during demolition detailing:
 - Size and location(s) of waste storage area(s)
 - Access for waste collection vehicles
 - Areas to be excavated
 - Types and numbers of storage bins likely to be required
 - Signage required to facilitate correct use of storage facilities

5. Operational Waste Management

This section provides a summary of the expected volumes of waste and recyclables that will be generated at the proposed development during the operational phase. It also provides details on the proposed on-site storage of the materials, the bin infrastructure and the anticipated frequency of collection.

Privately licensed waste and recycling contractors will be used for waste collections at the site.

5.1 Waste Generation

The waste streams that will likely be generated during operation of the school are identified in **Table 6** below.

Table 6 Likely waste streams generated and operational areas

| Waste Streams | Operational Area |
|--------------------------|--|
| General waste | Across site buildings, public areas, canteen |
| Food and garden organics | Across site buildings, public areas, canteen |
| Paper and cardboard | Across site buildings, public areas |
| Co-mingled recycling | Across site buildings |
| Secure documents | Administration area |
| Electronic waste | Learning areas, administration area |
| Bulky waste | Learning areas, specialist subject areas |

Table 7 below lists the assumed waste generation rates for operational waste, based on Ricardo experience and research.

Table 7 Waste generation rate assumptions¹

| Operational area | General waste generation rate | Recycling generation rate |
|------------------|-------------------------------|------------------------------|
| Office | 10L/100/m ² /day | 10L/100/m ² /day |
| Canteen | 150L/100/m ² /day | 150L/100/m ² /day |
| Education area | 5L/100/m ² /day | 5L/100/m ² /day |
| Childcare | 80L/100/m ² /day | 80L/100/m ² /day |

Table 8 below lists the estimated operational floor area of the development.

Table 8 Estimated operational floor areas

| Operational area | Ground Level (m ²) | Level 1 (m ²) | Level 2 (m ²) | Site total (m ²) |
|------------------|--------------------------------|---------------------------|---------------------------|------------------------------|
| Office | 675 | 760 | 675 | 2,110 |
| Canteen | 135 | 0 | 0 | 135 |
| Education area | 540 | 1,655 | 1,350 | 4,085 |
| Childcare | 405 | 0 | 0 | 405 |

¹ These waste generation estimates have been based off floor space. Waste generation estimates could be made more accurate on a number of students basis, however the student capacity of the school has yet to be determined.

Table 9 below lists the estimated waste generations for each operational area.

Table 9 Estimated daily waste generation rates

| Operational area | General Waste (L/day) | Recycling (L/day) |
|------------------|-----------------------|-------------------|
| Office | 211 | 211 |
| Canteen | 203 | 203 |
| Education area | 177 | 177 |
| Childcare | 324 | 324 |
| Total | 915 | 915 |

5.2 Waste storage area

Average dimensions of bin sizes and footprints used for waste storage area requirements are provided in **Table 10** below.

Table 10 Bin size and footprint areas

| Bin Size (L) | Height (mm) | Depth (mm) | Width (mm) | Approximate footprint (m ²) | Source |
|--------------|-------------|------------|------------|---|--|
| 80 | 870 | 530 | 450 | 0.24 | NSW EPA Better Practice Guide for resource Recovery in Residential Developments 2019 |
| 240 | 1,080 | 735 | 585 | 0.41-0.43 | NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019 |
| 660 | 1250 | 850 | 1370 | 0.86-1.16 | NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019 |
| 1,100 | 1470 | 1245 | 1370 | 1.33-1.74 | NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019 |

For the Waste Storage Area to provide suitable and adequate waste storage for the development it is proposed that the following bins are collected daily on operational school days:

- 2 x 660L General Waste bins
- 2 x 660L Recycling bins

A summary of the waste generation, waste collection frequency and total bin footprint requirements are outlined in **Table 11**.

Table 11 Total Waste Generation and proposed bin sizes, numbers, footprint required and collection frequencies for the Site

| Waste Stream | Generation Per Day (L) | Bin Type (L) | Collection Frequency/ Week | Bins required | Bin Footprint (m ²) |
|---------------|------------------------|--------------|----------------------------|---------------|---------------------------------|
| General Waste | 1,006 | 660 | 5 | 2 | 3 |
| Recycling | 1,006 | 660 | 5 | 2 | 3 |
| | | | | Total | 6 |

Please note calculations for the numbers of bins required are rounded up to the nearest whole number.

The estimation of the bin footprint includes a 15% contingency for manoeuvrability and a 10% capacity adjustment to accommodate fluctuations in the generation of all waste streams.

The proposed site plan has allocated approximately 37 m² of floor space for the bin enclosure. As outlined in **Table 11**, a minimum of 6 m² is required for the general waste and recycling bins. The additional space of the bin enclosure will allow for storage of spare bins (if required), waste handling equipment, management of peak volumes and space for manoeuvring waste equipment in the enclosure.

5.3 Specification for Waste Storage

The design of the waste storage area must take into consideration relevant controls from the DCP to minimise environmental impact. The following requirements must be considered during detailed design:

- A hose cock and a seweraged drainage point must be provided in or adjacent to the bin storage area.
- Responsibility for cleaning waste storage areas and the frequency of cleaning must be assigned and included in the waste management plan.
- The site must be able to store four 660L bins.
- The need for manual handling by collection staff must be kept to a minimum. The bin bay is to be located so that distance from bin bay to the nearest waste collection point accessible by the collection vehicle is no further than 15m.
- The bin bay must be positioned to minimise noise impacts on residents from the usage of bins and waste or recycling collection. The access routes must be highlighted on the plan.

5.4 Waste Transfer

Waste and recycling generated at the point of generation will be collected in smaller receptacles in each room as required. Each receptacle is to be of an appropriate size such that it is safe for staff to lift. Each receptacle will be lined with bags which are then to be transferred directly to the bin storage area by staff daily. Waste bags will be transported on a trolley to the bin storage area where cleaners will transfer the waste to the main bins.

Table 12 outlines the operational waste management transfer systems throughout the key areas of the school.

Table 12 Operational Waste Management Transfer System

| Space/ Use | Local Disposal | Transfer to Bin Storage Area | Bin Storage Area to Collection Point |
|---|--|--|--|
| Administration and Learning Spaces | Bins/ Receptacles as need in shared spaces for General waste and Recycling | Cleaners, Facility Management, Students on occasion, transfer waste from small receptacles to collection point | |
| Canteen | Bins/ Receptacles as need in shared spaces for General waste and Recycling | Cleaners transfer waste from smaller receptacles to bin storage area | Waste contractors collect waste from Waste storage area. Loading zone is located next to the waste storage area. |
| Covered outdoor learning area, public space | Bins/ Receptacles as need in shared spaces for General waste and Recycling | Cleaners, Facilities Management transfer receptacles to bin storage area | |

5.5 Access

5.5.1 Staff Access during operations

Staff will have easy access to the following separated materials bins located in the communal areas:

- Co-mingled container recycling.
- General waste.

Staff and collection contractors will have access to the waste storage area and will have the opportunity, in collaboration with facilities management, to amend the collection equipment and system should it be under-utilised.

5.5.2 Vehicle Access for collection

Access to bin storage areas must consider waste collection vehicle specifications. **Table 13** below lists the dimensions for rear and front loaded waste collection vehicles as identified in Australian Standard 2890.2. It is preferable to design for front loaded waste collection vehicles to allow for additional operational height.

Table 13 Waste collection vehicle specifications

| Vehicle classifications | Rear loaded waste collection vehicle dimensions | Front loaded waste collection vehicle dimensions |
|-------------------------------|---|--|
| Overall length (m) | 10.5 | 10.5 |
| Operational length (m) | 12.5 | 12.5 |
| Design width (m) | 2.8 | 2.8 |
| Design height (m) | 3.7 | 4.1 |
| Operational height (m) | N/A | +4.5m (specific to bins proposed) |
| Swept circle (m) | 22.5 | 22.5 |
| Clearance (travel height) (m) | 4.5 | 4.5 |
| Roadway/ramp grade (max) | 1:6.5 (15.4%) | 1:6.5 (15.4%) |
| Rate of change of grade (max) | 1:16 (6.25%) in 7.0m of travel | 1:16 (6.25%) in 7.0m of travel |
| Gross weight (max tonnes) | 28.0 | 28.0 |
| Front chassis clearance | 13° | 13° |
| Rear chassis clearance | 16° | 16° |

5.5.3 Signage

Signage will be provided in all waste disposal, storage and collection areas demonstrating how to use the waste management system, including what materials are acceptable in each recycling bins. In the bin storage area, all waste streams will be stored in clearly labelled, colour coded bins as appropriate to ensure that waste streams are not inadvertently mixed. Additional signage adjacent to the bin store area door/ gate will outline that the door/gate is to remain closed when not in use. Signage, like shown in **Figure 2**, should be displayed at eye level above waste and recycling bins, bin stickers should also be attached to each bin to inform staff and students which materials they can place in each bin.

Figure 2 Bin Storage and Collection Area signage - example posters



Source: <http://businessrecycling.com.au/research/signage.cfm>

6. Conclusion

Based on the preliminary plans for the development works, the approximate floor area which will be developed is 11,045m². There is likely to be approximately 193 tonnes of landfill material produced during construction activities associated with the building if the site is managed to achieve the maximum waste generation benchmark identified by the GBCA.

Waste generation estimates have been undertaken to determine the optimum waste storage areas required to meet the waste storage requirements based on the generation estimates provided. A total of 6,735m² of waste generating operational spaces led to an estimated 1006L of general waste and 1006L of recyclable waste per day during operation of the school. A bin storage area of 37m² is likely to provide sufficient onsite storage area based on a daily collection service and optimised layout. This area is to be developed in accordance with the relevant guidelines and best practice measures. Access to the bin storage area, and an appropriate space for manoeuvring the bins will be required, along with consideration of swept paths for trucks accessing the bin storage area for pick up of waste daily.

Once planning approval is granted for the proposed development, a WMP will need to be developed to:

1. Inform the development of a detailed CWMP for the Construction Certificate application, which is to include details regarding disposal and recycling of different materials expected from demolition, construction, and the transport and destinations of these materials.
2. Provide guidance that detailed design and fit-out of the building is consistent with best practice standards and plans for waste management, and
3. Inform all plans and procedures for operational waste management.