



# NSW Department Of Education

## North Kellyville New Primary School

### Waste Management Plan

November 2017

# Executive Summary

GHD has prepared this Waste Management Plan to assess the waste management requirements for site construction works and operation of the North Kellyville New Primary School, and address the various requirements.

Information is presented herein to support the North Kellyville New Primary School Environmental Impact Statement (EIS), by responding to the SEARs requirements, which are stated as follows:

*Identify, quantify and classify the likely waste streams to be generated during construction and operation and 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.*

Clause 11 of State Environmental Planning Policy (State and Regional Development) 2011 states that Development control plans (whether made before or after the commencement of this Policy) do not apply to State significant development. Notwithstanding this, the SEARs have requested that the DCP be addressed.

The Hills Shire Council Development Control Plan DCP 2012 provides guidance on preparing Waste Management Plans in Appendix A of the document, and a standard format for such plans. It also provides guidance on estimating construction waste quantities which has been utilised in this waste management report.

A specific DCP exists for the North Kellyville area (the North Kellyville Growth Centres Precinct DCP 2016). The Waste management requirements of the DCP and how they are addressed in this report are summarised in this report:

The SEARs also require the development to be assessed against a suitably accredited rating scheme to meet industry good practice. An Ecologically Sustainable Development Report was prepared for the project by GHD Woodhead. A Self-Assessment of the project against the GBCA Green Star Rating Tool was conducted to assess this requirement. Waste requirements were included in this assessment.

A total of 428 tonnes of waste has been estimated to be produced from construction activities, based on the Hills Shire DCP 2102 Waste Management Plan factors, for office building construction, as no factors are available for schools.

During construction, wastes generated on the site would typically be managed and minimised by a combination of waste planning and on site controls. Waste planning would include designing buildings to minimise on site cutting of components, and maximising on site assembly tasks, careful ordering of materials such as sand and building products to match quantities with amounts required, and on time ordering rather than having materials stored on site for months before being used and segregating materials and providing weather protection for stored materials on site, to maximise their fitness for use.

On site controls would include developing and implementing a Construction Waste Management Plan, segregating wastes generated on site, using different skip bins for recycling and waste, with separate bins for different recyclable materials, ensuring all waste disposal bins are clearly marked, keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials and ensuring that wastes are only disposed of to licenced facilities.

The preliminary civil design for the site indicates that there will be a net fill requirement and therefore no waste spoils to dispose of. However any soils excavated from site and surplus to requirements would be assessed, and deeper soils kept segregated from other material, to maximise the possibility that they can be disposed of as VENM.

Roads and driveways would be designed and constructed in accordance with the relevant authority requirements to allow the safe passage of a laden collection vehicle in all seasons.

On the basis of the Randwick City Council guidelines, the waste generation rates for 1,000 students would be 1,500 litres per week of waste and 500 litres per week of recycling.

This would require two 1,100 litre rear lift bin per week for garbage, and one 660 litre bin per week for recyclables. It may also be necessary to have a third 660 litre bin for bulky cardboard. Some contractors may also provide a separate bin for office paper. In addition, items such as batteries and fluorescent tubes may be separated by staff for recycling.

The garbage bins could be collected more frequently than weekly, if only a single 1,100 litre bin is desired, or a larger steel bin could be used.

The proposed bin storage area at the end of Thorogood Blvd has been designed to allow for large commercial size front or rear loading waste trucks, which will enable collection trucks to turn around using a three point turn movement, so that they can proceed in a forward direction along Thorogood Blvd after servicing the bins.

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# 1. Introduction

## 1.1 Background

The proposed North Kellyville New Primary School is to be constructed on a site at 120 Hezlett Road, Kellyville, within The Hills Shire Council (THSC) Local Government Area. The NSW Department of Education has acquired the site on which the school is to be constructed.

As part of the planning and development of the design for the school, schematic designs have been prepared by GHD for the school buildings and associated infrastructure to support the school operations. The school is designed for 1,000 students.

The site is legally known as Lot 100 and 101 in DP 1216659, but more commonly known as 120 Hezlett Road, North Kellyville.

As the proposed development comprises an educational establishment and has a Capital Investment Value (CIV) in excess of \$30 million it is categorised as State Significant Development (SSD) for the purposes of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Therefore an Environmental Impact Statement (EIS) is required.

Think Planners, which is preparing the EIS, sought Secretary's Environmental Assessment Requirements (SEARs) from the NSW Department of Planning and Environment, and these were issued on 12 May 2017.

This Waste Management Plan addresses the key requirements of the SEARs, as well as taking into account other requirements outlined in the Hills Shire Council Development Control Plan (DCP) 2012, and project specific ESD objectives.

## 1.2 State significant development application

The specific elements that this State Significant Development Application seeks approval for are:

- Dewatering of two dams
- Tree removal
- Bulk earthworks
- Construction of a two storey courtyard building that will contain:
  - 40 teaching spaces
  - Canteen
  - Library
  - Multi-purpose Hall
  - Office and Administration Space
  - Amenities for students and staff
  - OHSC accommodation
- Provision of a school drop off facility in front of the site along Hezlett Road
- Construction of a sports field
- Construction of two netball/basketball courts
- Construction of two playgrounds
- Provision of COLA

### 1.3 Scope and limitations

This report: has been prepared by GHD for the NSW Department of Education and may only be used and relied on by the NSW Department of Education for the purpose agreed between GHD and the NSW Department of Education as set out in section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than the NSW Department of Education arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

### 1.4 Purpose of this report

Information presented herein is to support the North Kellyville New Primary School Environmental Impact Statement (EIS), by responding to the SEARs requirements, which are stated as follows:

*Identify, quantify and classify the likely waste streams to be generated during construction and operation and 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.*

## 2. Project description

### 2.1 Site description

The proposed development includes:

- One main building on two levels and a separate bulk store, garden store and sports store
- Carparking
- Sports field
- Netball/basketball courts (2)
- Nature Plan area
- Junior and senior adventure playgrounds
- Vegetable garden
- Landscaped areas
- Paved areas

### 2.2 Site layout

The site layout is as shown on Site Plan 2126108-KN-SD-LA-0001 Rev F, a copy of which is provided in Appendix A. This plan shows the bin locations at the end of Thorogood Blvd.

### 2.3 Project construction stages

#### 2.3.1 Earthworks and site preparation

- Clearing of vegetation from site and disposal to licensed green waste facilities
- Establishing stormwater drainage systems to divert clean stormwater around cleared areas and construction zones
- Erosion and sediment controls to prevent sediments from leaving site
- Construction of temporary berms to prevent excess stormwater run off to adjacent residential sites
- Establishing internal site construction access roads, laydown areas and a dedicated construction management compound with temporary offices and site facilities
- Connecting temporary site services to the construction compound
- Bulk earthworks to create the general levels for buildings, outdoor recreational areas, soccer field and netball/basketball courts
- Stockpiling and conditioning of existing topsoils
- Dewatering and filling of the onsite dam and offsite dam
- Site reprofiling including construction of retaining walls and batters to create building pads

#### 2.3.2 Services

- Provision of services to the site including sewerage connection, water, gas, telecommunications



### 2.3.3 Buildings

- Excavations associated with building foundations and slabs
- Provision of below ground building services including plumbing and drainage
- Building slab construction
- Building framing
- Walls, windows and roofing
- Internal services (power, lighting)
- Internal fit out of buildings

### 2.3.4 Roadways

- Laying stormwater drainage pipes and placing pits
- Constructing kerbs and gutters for roads
- Paving of carparks

### 2.3.5 Landscaping and external works

- Utilisation of stored topsoil for garden beds
- Planting
- Paving of pedestrian areas
- Sports field construction
- Netball/basketball court construction
- Playground construction
- Vegetable garden area construction
- Landscaping of nature plan area

## 3. EIS requirements

### 3.1 State Significant Development Application

This report supports a State Significant Development Application for 120 Hezlett Road, North Kellyville to be submitted to the Department of Planning and Environment pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

### 3.2 Secretary's Environmental Assessment Requirements

The SEARs requirements for the EIS that relate to waste management are as follows:

#### 3. Built Form and Urban Design

- *Address the height, density, bulk and scale, setbacks of the proposal in relation to the surrounding development, topography, streetscape and any public open spaces.*
- *Address design quality, with specific consideration of the overall site layout, streetscape, open spaces, façade, rooftop, massing, setbacks, building articulation, materials, colours and Crime Prevention Through Environmental Design Principles.*
- *Detail how services, including but not limited to waste management, loading zones, and mechanical plant are integrated into the design of the development.*

#### 16. Waste

*Identify, quantify and classify the likely waste streams to be generated during construction and operation and 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.*

### 3.3 Hills Shire Council Development Control Plan 2012

The Hills Shire Council Development Control Plan DCP 2012 provides guidance on preparing Waste Management Plans in Appendix A of the document, and a standard format for such plans. It also provides guidance on estimating construction waste quantities which has been utilised in this waste management report.

### 3.4 North Kellyville DCP requirements

A specific DCP exists for the North Kellyville area (the North Kellyville Growth Centres Precinct DCP 2016). The waste management requirements from Section 6.7 of this DCP are stated below:

#### **Waste Management**

##### **OBJECTIVES**

- 1. To ensure sufficient storage and collection of wastes and recyclables during demolition and construction stages of development.*
- 2. To minimise waste generation and disposal to landfill via use of the waste hierarchy and careful source separation, reuse and recycling.*
- 3. To ensure the provision of adequate and appropriate storage areas for waste and recyclables.*

##### **CONTROLS**

*1. A Waste Management Plan is to be submitted with all development, with the exception of single dwelling housing. The Plan is to address:*

- best practice recycling and reuse of construction and demolition materials.*
- how recycled material, garbage and other waste generated by clearing, excavation and construction are to be stored and controlled,*
- the type and volume of waste expected to be generated during construction, and*
- handling methods and location of waste storage areas, including that such handling and storage has no negative impact on the streetscape, building presentation or amenity of occupants and pedestrians.*

*2. Provide adequate space within the main building for separation of waste material for recycling. Locate such facilities away from windows to habitable rooms.*

*3. Garbage storage areas must be located so as to not cause any negative impacts, in terms of visual appearance, noise or smell, to adjoining properties, or to the street.*

*4. Separate garbage from recycling chutes so that waste is divided into separate waste streams in order to recycle materials.*

*5. Where present, rear lanes are to be used for garbage collection.*

*6. Utilise ventilation stacks wherever possible to vent shops and basements.*

### **3.5 Green star assessment**

The SEARs require the development to be assessed against a suitably accredited rating scheme to meet industry good practice.

An Ecologically Sustainable Development Report was prepared for the project by GHD Woodhead. A Self-Assessment of the project against the GBCA Green Star Rating Tool was conducted to assess this requirement. Waste requirements were included in this assessment.

## 4. Addressing requirements

### 4.1 SEARs

The SEARs requirements for the EIS for waste management are addressed as follows:

Table 1 SEARs requirements

SEARs requirements	Where addressed
3. Built Form and Urban Design Detail how services, including but not limited to waste management, loading zones, and mechanical plant are integrated into the design of the development.	Section 6 covers Operational waste requirements
16. Waste Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.	Sections 5 and 6
Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.	Section 6 covers Operational waste requirements

### 4.2 DCP requirements

Clause 11 of State Environmental Planning Policy (State and Regional Development) 2011 states that Development control plans (whether made before or after the commencement of this Policy) do not apply to State significant development. Notwithstanding this, the SEARs have requested that the DCP requirements be addressed.

A specific DCP exists for the North Kellyville area (the North Kellyville Growth Centres Precinct DCP 2016). The waste management requirements of this DCP and how they are addressed in this report are summarised below.

Table 2 DCP requirements

	Requirement	How/where addressed
Demolition and construction	To ensure sufficient storage and collection of wastes and recyclables during demolition and construction stages of development.	Demolition wastes – refer Section 5.1 Construction wastes – refer Section 5
Recycling	To minimise waste generation and disposal to landfill via use of the waste hierarchy and careful source separation, reuse and recycling.	Refer Sections 5 and 6
Storage areas	To ensure the provision of adequate and appropriate storage areas for waste and recyclables.	Refer Section 6
Waste Management Plan	A Waste Management Plan is to be submitted with all development, with the exception of single dwelling housing. The Plan is to address:	
	<ul style="list-style-type: none"> <li>best practice recycling and reuse of construction and demolition materials.</li> </ul>	Refer Section 5
	<ul style="list-style-type: none"> <li>how recycled material, garbage and other waste generated by</li> </ul>	Refer Section 5.1 and 5

	clearing, excavation and construction are to be stored and controlled,	
	<ul style="list-style-type: none"> <li>the type and volume of waste expected to be generated during construction, and</li> </ul>	Types of waste are addressed in Section 5
	<ul style="list-style-type: none"> <li>handling methods and location of waste storage areas, including that such handling and storage has no negative impact on the streetscape, building presentation or amenity of occupants and pedestrians</li> </ul>	Operational waste arrangements are covered in Section 6
Separation of materials	Provide adequate space within the main building for separation of waste material for recycling. Locate such facilities away from windows to habitable rooms.	Operational waste arrangements are covered in Section 6
Location of garbage storage areas	Garbage storage areas must be located so as to not cause any negative impacts, in terms of visual appearance, noise or smell, to adjoining properties, or to the street.	Operational waste arrangements are covered in Section 6
Separation of garbage from recyclables	Separate garbage from recycling chutes so that waste is divided into separate waste streams in order to recycle materials.	Not relevant – there are no chutes proposed
Service routes	Where present, rear lanes are to be used for garbage collection.	Cul de sac access road to be used for trucks to access garbage and recycling bins
Ventilation	Utilise ventilation stacks wherever possible to vent shops and basements.	Not relevant

## 5. Construction and demolition wastes

### 5.1 Demolition wastes

The site is to be cleared and made ready for earthworks and the site buildings and other items that existed on site prior to this project (including old cars, and other debris) will be removed from the site by contractors in accordance with a Complying Development Certificate (CDC).

### 5.2 Construction waste generation

Waste that would typically be produced by construction works is as follows:

- Brick
- Waste mortar
- Concrete
- Asbestos sheeting (discussed above)
- Metals
- Timber
- Soil
- Paper and cardboard

No information is available at this stage of the project about the likely quantities of each type of waste produced during construction.

The Hills Shire Council DCP 2012 Appendix A provides guidance on typical quantities of construction wastes for schools and factories (but not schools). However it does not specify whether these figures are tonnes or cubic metres, but it is more common to use tonnages, so this is what is assumed below.

Table 3 Construction waste estimates

Building type	Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
Factory per 1000m <sup>2</sup>	0.25	2.10	1.65	0.45	4.80	0.60	0.50
Office Block per 1000m <sup>2</sup>	5.10	18.8	8.50	8.60	8.80	2.75	5.0

Assuming that a school is more like an office block than a factory, and based on a new building area of approximately 7,445 m<sup>2</sup>, the following quantities are estimated.

- Timber – 38 tonnes
- Concrete – 140 tonnes
- Bricks – 63 tonnes
- Gyprock – 64 tonnes
- Sand/soil – 66 tonnes
- Metal – 20 tonnes

- Other – 37 tonnes

This adds up to a total of 428 tonnes of waste estimated to be produced from construction activities.

### 5.3 Waste handling procedures and site responsibilities

During construction, wastes generated on the site would typically be managed and minimised by a combination of waste planning and on site controls.

#### 5.3.1 Waste planning

Waste planning activities would include:

- Designing buildings to minimise on site cutting of components, and maximising on site assembly tasks
- Careful ordering of materials such as sand and building products to match quantities with amounts required, and on time ordering rather than having materials stored on site for months before being used
- Segregating materials and providing weather protection for stored materials on site, to maximise their fitness for use
- Bringing in material such as sand in large bags rather than as bulk loads, to enable excess materials to be easily picked up and used at other sites
- Encouraging bulk handling and use of reusable and returnable containers
- At the time of tendering, advise contractors and sub-contractors and suppliers of the requirements to minimise waste on site
- Include provision in the tender documentation for the client to monitor the use of waste and recycling bins on site
- Development of a Construction Waste Management Plan by the main site contractor, which includes all of the above elements

#### 5.3.2 On site controls

On site controls would include:

- Implementation by the main site contractor of a Construction Waste Management Plan
- Segregating wastes generated on site, using different skip bins for recycling and waste, with separate bins for different recyclable materials
- Discussion about the site's waste management and recycling policies and practices with employees and subcontractors during site inductions and tool box talks
- Ensuring all waste disposal bins are clearly marked
- Keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials
- Ensuring that wastes are only disposed of to licenced facilities

### 5.4 Soil

Spoil refers to fill and soil from surface clearing, excavation and site re-profiling. Bulk earthworks will be required at the site to create level platforms for construction. The preliminary civil design indicates that there will be a net fill requirement and therefore no waste spoils to dispose of.

However if soil is required to be removed from a site, it can possibly be used on other projects, if it is classified as Virgin Excavated Natural Material (VENM). However it needs to be certified to confirm that it is VENM. As this site was used for agricultural purposes, it is uncertain whether spoil from the site can be classified as VENM.

Where an excavated material cannot be classified as VENM, it may still be eligible for reuse under the NSW EPA excavated natural material order and exemption. However, excavated natural material (ENM) does not include material located in a contamination hotspot, material that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

Soils excavated from deeper areas that may not have been exposed to agricultural chemicals and surplus to requirements would be assessed for classification as VENM, and kept segregated from other shallow spoil, to maximise the possibility that they can be disposed of as VENM.

## 5.5 Metals

Small quantities of metals are expected to be generated during construction from trimming of roof sheets and other activities resulting from construction of items that cannot be prefabricated. A dedicated bin would be used for these offcuts, which would be collected by a metals recycler.

## 5.6 Concrete

Concrete waste would be generated during construction, in the form of excess concrete from site pours, and washout from concrete pumps and other equipment. Concrete waste would be scraped up from the ground and collected in a dedicated bin for transport to a licensed construction waste processing facility.

## 5.7 Wiring

Wiring offcuts would be generated during building fit out. This would either be disposed of with metal wastes, or separately. Small pieces may be disposed of with mixed wastes, if the quantities are not great enough to justify a separate bin, or they may be collected by the electrical contractor, for co-disposal with their other wastes (assuming they generate this type of waste frequently and can demonstrate that they have suitable recycling arrangements in place).

## 5.1 Timber

Timber pallets would be stacked on site and returned to the pallet suppliers for re-use. Where pallets are damaged and not suitable for re-use, or non-standard, they would be placed in a dedicated wood waste bin, and sent to a recycling facility for chipping or fuel production. If they are made of treated timber, and not suitable for re-use or fuel, they would be disposed of to a licenced waste facility.

## 5.2 Plastic

Various plastic wastes would be generated during construction. They would range from shrink wrap, to plastic ties and miscellaneous items. Plastics would be collected in a dedicated bin and transported to a licensed plastic waste reprocessing facility.

## 5.3 Plasterboard

Plasterboard offcuts and damaged sheets or part sheets would be generated during building fit out. Plasterboard will be collected by a licenced waste contractor and transported to a recycling facility or licenced disposal facility depending on its suitability for recycling.



#### 5.4 Carpet/underlay

Carpet and underlay offcuts would be generated during building fit out. Plasterboard will be collected by a licenced waste contractor and transported to a recycling facility or licenced disposal facility depending on its suitability for recycling.

#### 5.5 Residual/mixed

Residual and mixed wastes would be generated during construction works. This material is expected to consist of:

- Small quantities of food and drink
- Non recyclable packaging in which food and drink is sold or stored
- Packaging in which building material is delivered or stored
- Composite materials not able to be separated and
- Small quantities of miscellaneous waste generated during the construction process.

General waste would be collected by a licenced waste contractor and disposed of at a licensed waste disposal facility.

## 6. Operational waste

### 6.1 Commercial and Industrial waste guidelines

The NSW EPA Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities, 2012 provides useful guidance on siting waste collection locations. It is recognised that this guideline is not strictly applicable to schools, but no school specific guidelines are available.

If a collection point is difficult for contractors to access collection charges may be higher. Ideally the collection point and storage area should be in the same place, avoiding the need to move bins to the collection point in time for servicing. If this is not possible, the collection point should be as close to the storage area as possible. If the storage area is not suitable as a collection point, the contractor will need to nominate a collection point where they can gain safe and easy access.

There are some general guidelines for collection points. They should:

- not be near intersections, ramps, roundabouts, pedestrian crossings, on busy roads or in narrow lanes
- not be near awnings, overhead wires, trees or other overhead structures
- be clear of air-conditioning and other service ducts and pipes, sprinklers, CCTV cameras, movement sensors, smoke detectors and other ceiling fixtures if located inside a building
- be on level surfaces rated for heavy vehicles
- have plenty of room for trucks to manoeuvre and reverse if necessary
- have enough room for bins to be manoeuvred by the driver for servicing
- be away from public areas;
- be well clear of vehicle, pedestrian, public, staff and visitor traffic areas
- not be restricted by parked cars or vehicle loading or unloading
- not be restricted by bollards, signs, plants, bins, seats or other street furniture
- not require vehicles to reverse
- not block the normal operations of the building
- be accessible at the times the collections are scheduled to take place and not behind locked gates.

All collections should take place in accordance with all the relevant acts, regulations, guidelines and codes administered by Austroads, the NSW Roads and Traffic Authority, NSW WorkCover and any local traffic requirements.

If the storage area and collection point are in separate locations, bins will have to be moved by staff or cleaners from the storage area to the collection point. Where bins smaller than 660 L in capacity are to be moved by hand:

- the distance between the storage area and collection point over which the bins are to be transported should
- not exceed 75 m in all circumstances
- the grades between the storage area and collection point should not exceed 1:14
- there should be no steps or kerbs anywhere on the route.

Bins greater than 660 litre and less than 1.5 m<sup>3</sup> should not be moved more than five metres from the storage area to the collection point.

Manual movement of bins greater than 1.5 m<sup>3</sup> in capacity should be avoided wherever possible. If movement cannot be avoided, these bins should not be moved more than three metres from the storage area to the collection point. No grade on the route should exceed 1:30.

The current site design would meet all of these requirements.

## 6.2 Waste generation estimates

There is little published information about the amount of waste and recycling typically produced by schools. There are a number of different tools available for estimating waste quantities for schools:

- (1) NSW EPA Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities (2012)
  - Garbage 2.6 litres per student per year
  - Recycling 7.2 litres per student per year
- (2) Randwick City Council Waste Guidelines (2015)
  - Garbage 1.5 litres per day per student
  - Recycling 0.5 litres per day per student
- (3) City of Melbourne waste guidelines (2015)
  - Garbage 0.5 litres of waste per student per week
  - Recycling 0.5 litres of recycling per student per week

On the basis of the Randwick City Council guidelines, the waste generation rates for 1,000 students would be 1,500 litres per week of waste and 500 litres per week of recycling.

This would require two 1,100 litre rear lift bin per week for garbage, and one 660 litre bin per week for recyclables. It may also be necessary to have a third 660 litre bin for bulky cardboard. Some contractors may also provide a separate bin for office paper. In addition, items such as batteries and fluorescent tubes may be separated by staff for recycling.

The garbage bins could be collected more frequently than weekly, if only a single 1,100 litre bin is desired, or a larger steel bin could be used.

Roads and driveways would be designed and constructed in accordance with the relevant authority requirements to allow the safe passage of a laden collection vehicle in all seasons.

The proposed bin storage area at the end of Thorogood Blvd has a turnaround area which is a standard cul de sac design. This should be able to enable collection trucks to turn around using a three point turn movement, so that they then can proceed in a forward direction along Thorogood Blvd after servicing the bins.

## 6.3 Site access for waste collection vehicles

### 6.3.1 Bin locations

The proposed bin storage area at the end of Thorogood Blvd has been designed to allow for large commercial size front or rear loading waste trucks, which will enable collection trucks to turn around using a three point turn movement, so that they then can proceed in a forward direction along Thorogood Blvd after servicing the bins. This is shown on the site plan provided in Appendix A.

### 6.3.2 Road and driveway construction and geometry

According to the NSW EPA Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities, there are certain desired requirements for roads used to access waste bins.

Designers are encouraged to consult with council and other relevant authorities prior to the design of roads and access points to ascertain specific requirements for the proposed development.

Appropriate heavy vehicle standards should be incorporated into the development design, including those specified in Acts, regulations, guidelines and codes administered by Austroads, Standards Australia, the NSW Roads and Traffic Authority, NSW WorkCover and any local traffic requirements.

Roads and driveways must be designed and constructed in accordance with the relevant authority requirements to allow the safe passage of a laden collection vehicle in all seasons.

Factors to be considered in design include:

- gradients for turning heads
- longitudinal road gradients
- horizontal alignments
- vertical curves
- cross-falls
- carriageway width
- verges
- pavement widths
- turning areas (see below)
- local area traffic management requirements (for example speed humps)
- sight distance requirements
- clearance heights (for example a vertical clearance of 6.5 metres is required to load front-lift vehicles)
- manoeuvring clearance
- road strength (industrial-type strength pavement required, designed for a maximum wheel loading of seven tonnes per axle to accommodate garbage and recycling collection vehicles).

### 6.3.3 Turning circles

Turning circles for medium and heavy rigid vehicles are 10 m and 12.5 m respectively. The proposed bin storage area has been designed to accommodate vehicle movements associated with collecting the bins, doing a three point turn, and leaving in a forward direction. This is shown on the turning circle analysis provided in Appendix B.

## 6.4 Storage and collection

It is anticipated that cleaners, operating after classes have finished each day, will collect the contents of the bins in each area and on each level. Bins with waste and recycling sections are expected to be located in outdoor common areas, rather than having bins in every classroom.

Waste materials are expected to be collected in bags and transported by the cleaners to the garbage bin area using trolleys. This area will have outdoor lighting, and it is securely within the school grounds.

Waste collection contractors will enter the school after normal hours, pull out bins as required for servicing and replace them when emptied.

## 6.5 Storage requirements

Two bin sizes are likely to be used. A 660 litre bin (Figure 1) is easily movable by waste management contractors, or school staff. Alternatively, a 1,100 litre rear lift bin (Figure 2) could be used.



Figure 1 Typical 660 litre bin



Figure 2 Typical 1100 litre bin

## 7. Conclusions

GHD has prepared this Waste Management Plan to assess the waste management requirements for site construction works and operation of the North Kellyville New Primary School, and address the various requirements.

Information is presented herein to support the North Kellyville New Primary School Environmental Impact Statement (EIS), by responding to the SEARs requirements, which are stated as follows:

*Identify, quantify and classify the likely waste streams to be generated during construction and operation and 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.*

Clause 11 of State Environmental Planning Policy (State and Regional Development) 2011 states that Development control plans (whether made before or after the commencement of this Policy) do not apply to State significant development. Notwithstanding this, the SEARs have requested that the DCP be addressed.

The Hills Shire Council Development Control Plan DCP 2012 provides guidance on preparing Waste Management Plans in Appendix A of the document, and a standard format for such plans. It also provides guidance on estimating construction waste quantities which has been utilised in this waste management report.

A specific DCP exists for the North Kellyville area (the North Kellyville Growth Centres Precinct DCP 2016). The Waste management requirements of the DCP and how they are addressed in this report are summarised in this report:

The SEARs also require the development to be assessed against a suitably accredited rating scheme to meet industry good practice. An Ecologically Sustainable Development Report was prepared for the project by GHD Woodhead. A Self-Assessment of the project against the GBCA Green Star Rating Tool was conducted to assess this requirement. Waste requirements were included in this assessment.

A total of 428 tonnes of waste has been estimated to be produced from construction activities, based on the Hills Shire DCP 2102 Waste Management Plan factors, for office building construction, as no factors are available for schools.

During construction, wastes generated on the site would typically be managed and minimised by a combination of waste planning and on site controls. Waste planning would include designing buildings to minimise on site cutting of components, and maximising on site assembly tasks, careful ordering of materials such as sand and building products to match quantities with amounts required, and on time ordering rather than having materials stored on site for months before being used and segregating materials and providing weather protection for stored materials on site, to maximise their fitness for use.

On site controls would include developing and implementing a Construction Waste Management Plan, segregating wastes generated on site, using different skip bins for recycling and waste, with separate bins for different recyclable materials, ensuring all waste disposal bins are clearly marked, keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials and ensuring that wastes are only disposed of to licenced facilities.

The preliminary civil design for the site indicates that there will be a net fill requirement and therefore no waste spoils to dispose of. However, any soils excavated from site and surplus to

requirements would be assessed, and deeper soils kept segregated from other material, to maximise the possibility that they can be disposed of as VENM.

Roads and driveways would be designed and constructed in accordance with the relevant authority requirements to allow the safe passage of a laden collection vehicle in all seasons.

On the basis of the Randwick City Council guidelines, the waste generation rates for 1,000 students would be 1,500 litres per week of waste and 500 litres per week of recycling.

This would require two 1,100 litre rear lift bin per week for garbage, and one 660 litre bin per week for recyclables. It may also be necessary to have a third 660 litre bin for bulky cardboard. Some contractors may also provide a separate bin for office paper. In addition, items such as batteries and fluorescent tubes may be separated by staff for recycling.

The garbage bins could be collected more frequently than weekly, if only a single 1,100 litre bin is desired, or a larger steel bin could be used.

The proposed bin storage area at the end of Thorogood Blvd has been designed to allow for large commercial size front or rear loading waste trucks, which will enable collection trucks to turn around using a three point turn movement, so that they can proceed in a forward direction along Thorogood Blvd after servicing the bins.

## 8. References

City of Melbourne Waste Generation Rates, Jan 2015

NSW Planning and Environment, North Kellyville Growth Centre Precincts, Development Control Plan, Nov 2016

Hills Shire Council Development Control Plan (DCP 2012) Appendix A Waste Management Plan

NSW EPA Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities, 2012

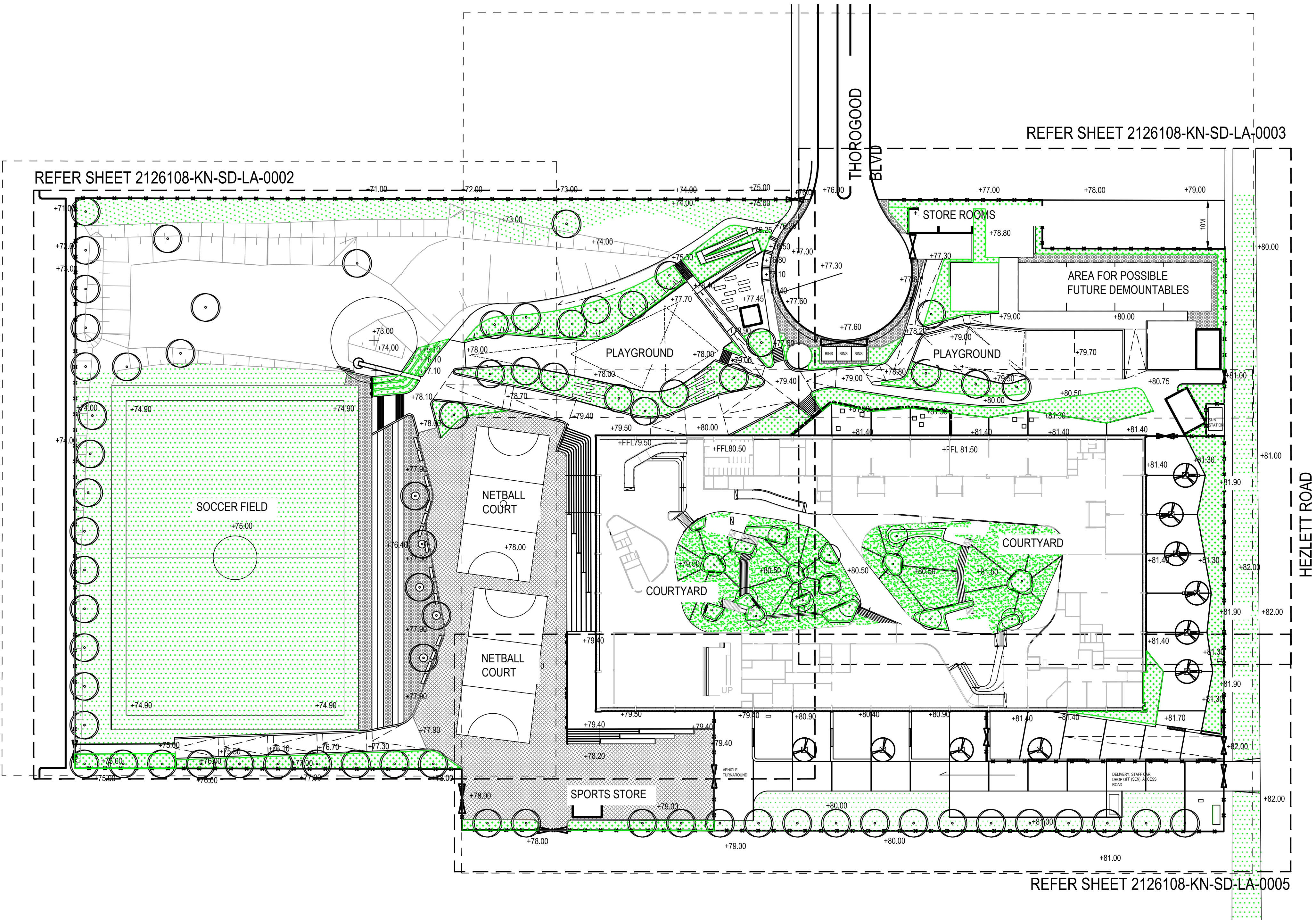
Randwick City Council Waste Management Guidelines, 2015



# Appendices

## Appendix A – Site layout details





PLANTING SCHEDULE				
BOTANICAL NAME	COMMON NAME	POT SIZE	NUMBER	TYPICAL USE
TREES				
BACKHOUSIA CITRIODORA	LEMON MYRTLE	100 Ltr	29	Path/ avenue planting
CORYMBIA CITRIODORA	LEMON SCENTED GUM	100 Ltr	40	School perimeter planting
EUCALYPTUS TERETICORNIS	FOREST RED GUM	100 Ltr	4	Scattered lawn planting
TRUSTANIOPSIS LAURINA	WATER GUM	100 Ltr	10	Plaza planting
WATERHOUSIA FLORIBUNDA	WEeping LILLY PILLY	100 Ltr	16	Indoor Planters
SHRUB & GROUNDcover PLANTING				
ASPIDISTRA ELATOR	CAST IRON PLANT	200mm	40	Indoor Plants
ASPLENIUM ANTIQUUM	BIRDS NEST FERN	150mm	36	Indoor Planters
CORDYLINE 'MINI PINK SPECIAL'	MINI PINK SPECIAL	150mm	40	Indoor Planters
DIANELLA TASMANICA	TASMAN FLAX LILLY	150mm	1275	Feature garden beds and slope stabilisation
GREVILLEA 'BRONZE RAMBLER'	GREVILLEA	tubestock	900	Slope stabilisation
GREVILLEA 'FOREST RAMBLER'	GREVILLEA	tubestock	900	Slope Stabilisation
FATSIA JAPONICA	JAPANESE ARALIA	200mm	36	Indoor Planters
HIBBERTIA SCANDENS	GOLDEN GUINEA VINE	tubestock	1175	Slope Stabilisation & feature garden beds
LEPTOSPERMUM LAEVIGATUM	COASTAL TEA TREE	tubestock	300	Screening & slope stabilisation
LOMANDRA TANIKA	TANIKA	150mm	1275	Feature garden beds and slope stabilisation
MELALEUCA THYMIFOLIA	THYME HONEY MYRTLE	150mm	375	Feature garden bed
STRELITZIA REGINAE	BIRD OF PARADISE	150mm	375	Feature garden bed
VIOLA HEDERACEA	NATIVE VIOLETS	tubestock	150	Indoor Planters
	MIXED HERBS	punnets	30	Indoor Planters

IRRIGATION NOTE: CONTRACTOR TO ALLOW FOR THE DESIGN AND CONSTRUCTION OF AN AUTOMATED IRRIGATION SYSTEM FOR ALL LAWN AREAS, INTERNAL COURTYARD PLANTERS, SPORTS TURF AREAS, TREES AND GARDEN BED AREAS

PRELIMINARY

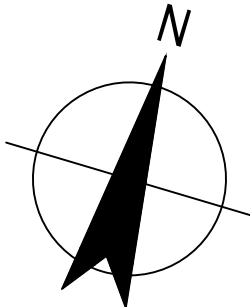
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
I		SCHEME DESIGN FOR APPROVAL	SH	PM*	MD*	20.09.17

Plot Date: 22 November 2017 - 2:11 PM

Plotted by: Ralph Nowoisky

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Drawn L.KRSTIC

Designer S.HANSEN

Drafting Check A.MACLEAN\*

Design Check R.NOWOISKY\*

Approved (Project Director)  
Date

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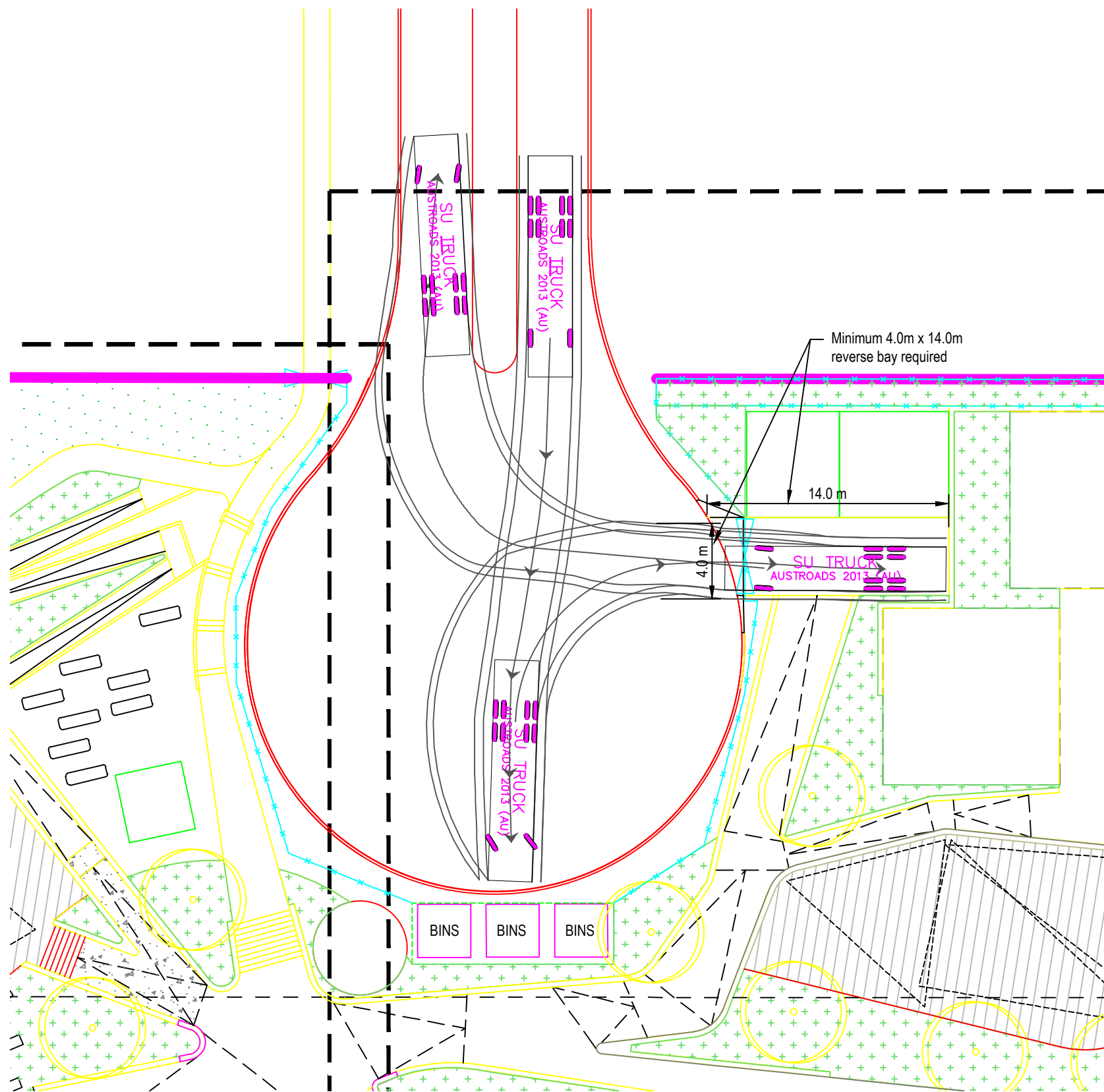
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Client **NSW DEPARTMENT OF EDUCATION**  
Project **NORTH KELLYVILLE NEW PRIMARY SCHOOL**  
Title **SITE PLAN**

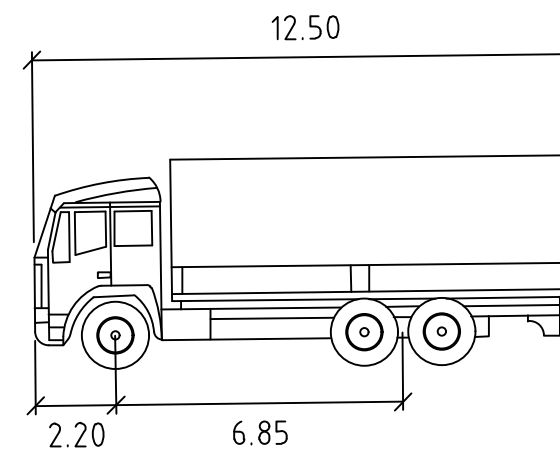
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## Appendix B – Turning circle analysis



**SWEPT PATH ANALYSIS**  
Scale 1:250



**SU TRUCK**

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6



**PRELIMINARY DRAFT**

**GHD WOODHEAD**  
PROPOSED NORTH KELLYVILLE PUBLIC SCHOOL  
**SWEPT PATH ANALYSIS**  
12.5m WASTE COLLECTION VEHICLE

**21-26108-SK01**    REV B    21/11/2017

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EP\_Kellyville North New Primary School Waste Management Plan Rev E.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
01	D Gamble	A Montgomery	On file	D Gamble	On file	9/6/17
02	D Gamble	C Sakellaris	On file	S Mellor	On file	14/6/17
03	D Gamble	C Sakellaris	On file	S Mellor	On file	20/6/17
04	D Gamble	T Murace	On file	S Mellor	On file	26/6/17
05	D Gamble	A Montgomery				24/8/17
06	D Gamble	A Montgomery	On file	P. MALLIA		22/11/17

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