FORESIGHT ENVIRONMENTAL

Lindfield Learning Village

100 Eton Road, Lindfield

Construction & Demolition Waste Management Plan

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This report is based on information provided by The NSW Department of Education c/o Designinc Sydney Pty Ltd coupled with Foresight Environmental's knowledge of waste generated within the education and commercial sectors. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Designinc Sydney.

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Foresight Environmental will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Foresight Environmental negligence.

Revision No.	Issue date	Author	Reviewed by	Reason/comments
1	13 March 2017	Scott Ebsary	Sandy Casaroli	Initial issue for review
2	15 March 2017	Scott Ebsary	Patrick Arnold	Update comments regarding stage 2
3	27 March 2017	Scott Ebsary	Patrick Arnold	Combine staged analysis and add collection vehicle details
4	12 October 2017	Scott Ebsary	Patrick Arnold	Updated to address EPA feedback

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1. Introduction

This construction and demolition waste management plan (WMP) has been prepared by Foresight Environmental on behalf of the New South Wales Department of Education (the 'Applicant'). It accompanies an Environmental Impact Statement (EIS) prepared in support of State Significant Development Application SSD 8114 for the development of 'Lindfield Learning Village' in the former UTS Ku-ring-gai Campus at 100 Eton Road, Lindfield, NSW (the site). The site, is located within Ku-ring-gai Municipal Council LGA.

It is proposed to refurbish the existing building to accommodate 2124 students in six home bases, each comprising 354 students ranging in ages from Kindergarten to year 12. The new school is currently to be known as the Lindfield Learning Village (the School) and will contain 'state of the art' collaborative learning spaces, shared educational facilities, open play spaces, auditorium and gymnasium in a landscaped Australian bush setting.

The purpose of this operational waste management plan is to outline the systems and practices involved in managing waste and recycling during the demolition and construction phase of the development as detailed within the EIS.

2. Overview of Development

The proposed development at the former UTS Ku-ring-gai campus consists of extensive internal demolition works involving the removal of many internal brick and framework walls, removal of asbestos-lined external glazing, removal of carpet and other existing internal surfaces and fixtures.

Construction of the proposed Lindfield Learning Centre consists of:

- Shared facilities including gymnasium, auditorium, cafeteria/dining and other specialist learning spaces, including science labs etc;
- Administration area for the whole school;
- Research space for PhD students;
- A 40-unit childcare

The following tables provide details on the waste estimates and collection protocols for the proposed development during demolition and construction phases.

3. Waste Generation Estimate

The aim of this Plan is to ensure that all waste resulting from construction and demolition activities is managed in an effective and environmentally aware manner. Specifically,

- To maximize the reuse and recycling of demolition and construction materials
- To reduce the volume of materials going to landfill
- To maximise waste material avoidance and reuse on site
- To ensure that where practicable, an efficient recycling procedure is applied to waste materials
- To ensure efficient storage and collection of waste

The following waste estimates address the stage 1 and stage 2 works of the proposed Lindfield Learning Centre development which consists of the extensive internal demolition and construction of six home bases. The waste quantity estimates and materiality are based on the cost plan provided by DesignInc Sydney.

3.1 Demolition

The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing should be conducted by the project managers. If acid sulphate soils are present on site, a separate management plan will need to be prepared for handling and disposal of such soil.

All waste generated during the project should be assessed, classified and managed in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste (DECCW, December 2009).

Based on the quantity survey provided to Designinc Sydney, it is estimated that approximately **3,986m^3** of waste will be generated during the demolition/excavation phase of the stage 1 works of the development. The following table details the estimated composition by area or volume of demolition waste to be generated.

Table 1 - Composition of stage 1 demolition waste by volume

Material	M^3
Bricks	1039
Plasterboard	909
Concrete	678
Asbestos	407
Timber	335
Glazing	319
Carpet	239
Metal	199
General Residual	80
Recycling residual	80
Total	**3,986**

3.2 Construction

The quantity of waste materials to be generated onsite are estimates based on the information provided to Foresight Environmental and therefore the systems that will be put in place need to incorporate flexibility to allow for variation in the total quantities generated. Active site management during the construction phase will ensure all waste/recyclable materials are disposed of appropriately and that all waste receptacles are of sufficient capacity to manage onsite activities.

Table 2 below details the estimated composition by area or volume of construction waste to be generated during the construction works.

Table 2 - Composition of stage 1 construction waste by volume

Material	M^3
Timber	311
Concrete	277
Plasterboard	198
Glazing	119
Carpet	90
Paint	43
General Residual	40
recycling residual	40
Total	**1,116**

4. Waste Management Strategy

The following waste hierarchy will be used as a guiding principle:

Avoid and Reduce

Minimise the production of waste materials in the construction process by

- Assessing and taking into consideration the resultant waste from different design and construction options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-cut or fabricated.
- Not over ordering products and materials

Reuse

Ensure that where ever possible, materials are reused either on site or offsite

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

Identify all recyclable waste products to be produced on site

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Note: In some cases it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with OEH requirements
- Implement regular collection of bins

5. Waste Management Systems

5.1 Onsite and Offsite Systems

Table 3 – Waste management systems (demolition)

Material	Estimated volume (m^3)	Onsite (re-use or recycle)	Offsite (recycling contractor)	Disposal (contractor and landfill site)
Bricks	1,039m^3		Separated onsite then transported to brick recycling facility	
Plasterboard	909m^3		Stockpiled onsite and collected by plasterboard supplier/recycler or taken to appropriate recycling facility	
Concrete*	678m^3		Removed from site as required for recycling/reuse at C&D facility for processing. Rinse water captured and removed from site for offsite processing.	
Asbestos	407m^3			A licensed asbestos contractor will be engaged to dismantle and dispose of asbestos as per legislative requirements – a separate asbestos management plan will be produced detailing the safe disposal of the material
Timber	335m^3		Separated onsite then returned	

			to supplier for re-use if appropriate or transported timber recycling yard	
Glazing	319m^3		Stockpiled and collected as required by specialty glass recycler or taken to appropriate C&D facility for separation and recycling	
Carpet	239m^3		Stockpiled and collected as required by carpet supplier for recycling contractor	Unsuitable material will be taken to landfill for disposal
Metal	199m^3		Stockpiled and collected as required by specialty metal recycler or taken to appropriate C&D facility for separation and recycling	
Residual general recyclables	80m^3		Collected by contractor and disposed at appropriate recycling facility	
Residual general waste	80m^3			Collected by contractor and disposed at appropriate landfill

*Concrete waste is not to be disposed of on the project site. All set/solid concrete waste will be taken offsite in skips/trucks for offsite reprocessing at a C&D recycling facility.

Table 4 details the expected waste materials and management systems for the construction phase of the project.

Table 4 – Waste management systems (construction)

Material	Estimated volume (m^2 or m^3 where indicated)	Onsite (re-use or recycle)	Offsite (recycling contractor)	Disposal (contractor and landfill site)
Timber	311m^3		Separated onsite then returned to supplier for re-use if appropriate or transported timber recycling yard	
Concrete*	277m^3		Separated where possible and taken to concrete recycling facility – deposited onsite directly into skips or trucks to be removed from site.	
Plasterboard	198m^3		Stockpiled onsite and collected by plasterboard supplier/recycler or taken to appropriate recycling facility	
Glazing	119m^3		Stockpiled and collected as required by specialty glass recycler or taken to appropriate C&D facility for separation and recycling	
Carpet	90m^3		Stockpiled and collected as required by carpet supplier for recycling contractor	Unsuitable material will be taken to landfill for disposal
Paint	43L		Clean tins recycled by metal recycler where possible	Residue/wash-off hardened and disposed appropriately
Residual general recyclables	40m^3		Collected by contractor and disposed at appropriate recycling facility	

Residual general waste	40m^3			Collected by contractor and disposed at appropriate landfill

*Concrete waste and concrete rinse water is not to be disposed of on the project site. Un-set concrete waste should be returned in the agitator trucks to the supplier where possible or directed to a dedicated watertight skip to prevent the entry of precipitation. Concrete rinse water should also be captured and directed to a watertight skip to prevent the entry of precipitation – rinse water should then be diposed of at an appropriate water treatment facility.

Note: The quantities of construction and demolition waste materials have been estimated using industry guides for predicting waste quantities[1]. The figures in Table 3 and 4 above are estimates and are used as a guide for designing the waste management systems on site. These figures will be adjusted according to the final building material selection and quantities. The waste management systems will be adjusted as necessary.

It should be noted that there are multiple offsite recycling/disposal facilities available for the appropriate processing of the materials detailed above and the facility choice will depend largely on the waste contractor/supplier engaged.

5.2 Waste Vehicle Movements

Detailed information regarding onsite traffic management has been provided in the Traffic and Transport Assessment prepared by Arup (draft 3, 23 March 2017). An excerpt from that report is provided below relating to construction activity (including waste collection):

The level of construction traffic will be low with up to 2 trucks per hour expected at busy times for removal of waste materials and delivery of new building materials.

Waste collection vehicles would enter site via the Eton Road main access point within the standard construction operating hours (7am-6pm Mon-Fri, 8am-1pm Saturdays).

[1] McGregor Environmental Services (2000) Predicting C&D waste quantities in the Inner Sydney Waste Board Waste Planning Guide for Development Applications-Planning for Less Waste (1998) NSW Waste Boards

The body of any vehicle or trailer used to transport waste or excavations spoils from the site must be covered before leaving the premises to prevent any spill or escape of any dust, waste or spoil from the vehicle or trailer.

Any vehicles used for transporting waste or excavation spoils from the site must ensure that all mud, dirt, dust or other material likely to fall from or be cast off the wheels, underside or body of the vehicle is removed before the vehicle leaves the premises. It is proposed that a temporary wash down bay/area be estabilised during the demolition/construction phase to facilitate this process. If a wash down bay is established due consideration should be made to bunding and/or appropriate sediment run-off controls.

5.3 Contracts and Purchasing

Each subcontractor working on the site will be required to adhere to this Waste Management Plan.
The Head Contractor will ensure each subcontractor:

- Takes practical measures to prevent waste being generated from their work
- Implements procedures to ensure waste resulting from their work will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately as appropriate
- Ensures that the right quantities of materials are ordered, minimally packaged and where practical pre fabricated. Any oversupplied materials are returned to the supplier
- Implements source separation of off cuts to facilitate reuse, resale or recycling.

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site.
- Ensuring all skips/bins/stockpiles are clearly labeled identifying which material is suitable for each receptacle
- Engaging appropriate waste and recycling contractors to remove waste and recycling materials from the site
- Co-coordinating between subcontractors, to maximise on site reuse of materials
- Monitoring of bins on a regular basis by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the appropriate location for recycling and stockpiling station/s. And that each bin/skip/stockpile is clearly sign posted
- Providing training to all site employees and subcontractors in regards to the WMP as detailed in section 5.3 below.

- Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised by a non-conformance report procedure. The offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractors' Quality Management Systems
- Retaining demolition and construction waste dockets to confirm and verify which facility received the material for recycling or disposal.

5.4 Training and Education

All site employees and sub-contractors will be required to attend a site-specific induction that will outline the components of the WMP and explain the site-specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site and where they are stockpiled. They are also to be made aware of waste reduction efforts in regards to packaging.

The site manager will post educational signage in relation the recycling activities on site in breakout areas, lunch rooms etc.