

Pacific Brook Christian School

**Demolition and Construction
Waste Management Plan
(For Masterplan)**

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1 Introduction

This Waste Management Plan (WMP) has been prepared on behalf of NBRS Architects to accompany a Development Application for the Pacific Brook Christian School project.

This Plan details the management of waste during the demolition and construction phases of the project. The Plan has been developed with consideration of Muswellbrook Shire Council's and other Authority's requirements. It is intended to inform the design of the waste services by identifying the estimated waste generation and management for the demolition and construction waste associated with this development.

The Demolition and Construction Waste Management Plan has been developed to ensure that all waste resulting from demolition/construction activities is managed in an effective, safe and environmentally aware manner. Specifically,

- To minimise the generation of waste 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 raise awareness among employees and subcontractors of their waste management responsibilities

Management strategies reflect current best-practice requirements, and relevant Sections of the *Protection of the Environment Operations Act 1997* and the NSW Environment Protection Authority *Waste Classification Guidelines, Part 1: Classifying Waste*, as well as consideration of industry best practice for this type of development.

In particular, there will be compliance with *Australian Standard AS2601: The demolition of structures*. This in summary requires that the demolition of structures:

- sets out requirements for the planned demolition of buildings and certain other structures so that the risk of injury to workers, other site personnel and the public, and the risk of damage to adjacent property and the immediate environment is minimised;
- covers the methods and safety procedures applicable to demolition work in general as well as procedures for some types of structures;
- deals with manual and mechanical demolition techniques including those employing specialised earth-moving type machinery;
- includes informative appendices covering some contractual considerations, a checklist for contractors and qualifications for site personnel;
- safety and health issues are addressed under the headings of:
 - Health and safety of the public - covering general requirements, lighting, falling materials, fencing, hoardings and warning notices, scaffolding, overhead protection for footpaths, and hazardous materials and conditions;

- Safety and health of site personnel - covering general safety, personal protective clothing and equipment, cutting and welding, fire protection, first aid, amenities, removal of hazardous material and electrical safety;
- Protection of adjoining buildings and protection of immediate environment - covering requirements relating to access and egress, damage and structural integrity, vibration and concussion, weatherproofing, burning, dust control, noise control, protection of public roads and protection of sewers and water courses; and protection of the site.

Adherence to AS2601 is required under the Environmental Planning and Assessment Regulation 2000.

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

Note: The testing and classification of any excavated material is not covered in this report. Where necessary separate specialist testing will be conducted by the project managers.

2 Demolition and Construction Waste Management Principles

2.1 Waste Management Principles

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



Avoid and Reduce

Minimise the production of waste materials in the demolition and construction process by:

- Assessing and taking into consideration the resultant waste from different demolition, 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 regulatory requirements
- Implement regular collection of bins

Section 143 of the Protection of the Environment Operations Act 1997 requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site developers to ensure all contractors clearly specify where all wastes are to be transported, the capacity of the nominated facilities to receive/manage the waste and to ensure that reports on management aspects (types, quantities and disposal pathways) are provided.

2.2 Liquid Waste

Liquid waste may be produced on site for environmental control measures such as:

- Site and vehicle cleaning
- Dust control waste

The following measures will be taken to minimise the impact of liquid waste:

- Ensure water is used in moderation and no taps are left continuously running
- Use any grey water produced on site for irrigation or for dust suppression
- Only discharge clean water into storm water

2.3 Stormwater Pollution Prevention

All actions will be undertaken to avoid pollution entering stormwater drains and for litter generation. The following will be initiated:

- i. Prior to commencement of any works a Safe Work Method Statement will be completed and reviewed to determine potential for stormwater pollution and/or litter generation
- ii. The proponent (contractor), will need to develop a management strategy to manage the potential for these issues to be realised
- iii. Site inspections will be conducted during the working day to monitor potential for stormwater pollution generation and where identified, works will cease until appropriate controls are implemented
- iv. Waste water and storm water will be managed and disposed of in accordance with Water Authority requirements.

2.4 Litter Management

- i. Daily site inspections will be conducted to identify litter, remedy the situation and investigate the cause so as to reduce the potential for the issue to occur in the future.
- ii. Sufficient quantities of bins (and/or bin space), will be made available so as to avoid dumping of materials outside bins
- iii. All waste/recycling bins will have covers so as to ensure that wastes cannot be blown out during windy conditions. This will also apply to relevant stocks of materials to be used in construction.
- iv. Personnel will be allocated the role of litter management in that they will periodically inspect the site and surrounds for litter and if identified collect and dispose of it.

2.5 Records

Records will be kept of all wastes and recyclables generated and either used on site, or transported off-site during the demolition and construction stages of the development.

It will be a condition of appointment that all waste/recycling contractors involved in the demolition and/or construction stages provide these records, and that they also contain details of the facilities that the materials are transported to.

These records will be made available to Council on request.

2.6 Waste/recyclables storage (on-site)

All waste and recycling materials will be stored in bins provided by the appointed contractor(s). These bins will be appropriately coloured and signed to indicate what materials are to be deposited into them and located so as to maximise the recovery of reusable/recyclable materials.

As construction activities progress, the designated bins will be moved so as to maximise the collection of materials that will be diverted from landfill. This will also involve relocating signage advising as to correct waste management.

2.7 Waste/recyclables treatment (on-site)

There will be no treatment of wastes or recyclables on-site except for possible removal of contaminants prior to forwarding to off-site recyclers.

3 Demolition Materials

3.1 Overview

The table below details the different waste streams expected in the demolition phase. The relevant disposal/recycling facilities have not been detailed as the waste contractor and sub-contractors have not yet been appointed for the project.

All waste contractors/sub-contractors will be required to detail all intended disposal facilities to ensure that legislative and safety requirements are met, the guiding principles of the waste hierarchy are upheld and maximum diversion from landfill is achieved. As previously stated, records will be required to be maintained by all contractors and made available to Council so as to validate management pathways.

The potential for reuse of materials on-site (and this will be encouraged for both demolition activities as well as considering what could be used for the construction phase of the development), will depend on the quality of the materials once demolition proceeds.

3.2 Estimated Volumes

The following table details the estimated composition by m³ of demolition waste to be generated and management strategy. It is important to note that these are estimates and the important issue is that the materials will be managed so as to avoid wherever possible disposal to landfill.

This process and the management of any excavation and removal of contaminated soil and waste (if identified), from the site will be undertaken and managed by qualified contractors and consultants in accordance with all the relevant standards and regulations and is not addressed in this report.

Waste management systems - demolition

Materials on site		Destination		
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Concrete	35 m ³	No on-site reuse	Collected by contractor and disposed at concrete recycling facility	Facility TBA upon appointment of contractor

Materials on site			Destination	
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Timber	15 m3	No on-site reuse	Recyclable timber(untreated) will be collected and recycled at appropriate timber yard. Unrecyclable timber will be disposed at landfill	Facility TBA upon appointment of contractor
Bricks	5 m3	Bricks will be stockpiled and reused wherever possible.	Acceptable quality bricks collected by a contractor and sold for reuse. Unusable bricks will be collected and recycled at an appropriate facility.	Facility TBA upon appointment of contractor. No disposal to landfill.
Plasterboard	10 m3	No on-site reuse	Collected by the contractor for recycling	Facility TBA upon appointment of contractor
Metal	25 m3	No on-site reuse	Collected by specialist metal subcontractor for recycling	Facility TBA upon appointment of contractor
Carpet	2 m3	No on-site reuse	This will be disposed of into a designated bin and collected for recycling if of the required quality or disposal to landfill	Facility TBA upon appointment of contractor

Materials on site		Destination		
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Green waste	350 m3	Where possible green waste material will remain onsite and be reused in landscape areas	Collected and disposed at green waste/mulching facility	Facility TBA upon appointment of contractor. No disposal to landfill.
Mixed hard plastics	20 m3	No on-site reuse	Collected by contractor for recycling. Facility TBA upon appointment of contractor.	No disposal to landfill
Mixed Recyclables	35 m3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the subcontractor for recycling	Facility TBA upon appointment of contractor. No disposal to landfill.
General waste	50 m3	No on-site reuse or recycling	Separated onsite into dedicated receptacles. Collected by the waste subcontractor for disposal to landfill.	Facility TBA upon appointment of contractor

3.3 Other Materials

A range of other materials may be present on the site once the demolition activities commence.

All potentially recyclable materials are to be separated and stored on-site for an appointed waste/recycling contractor to inspect and to determine the suitability of the material for recycling (or even reuse). If approved for either action, then the contractor can then remove the items.

For materials that are not designated as potentially able to be reused or recycled, then they are to be disposed of at a landfill licenced to receive those specific materials.

4 Hazardous Waste Materials

4.1 Management Procedures

At this stage, no hazardous materials have been identified on the site.

If needed to be used, contractors employed to manage any identified hazardous wastes will be required (prior to appointment), to demonstrate their compliance with NSW EPA and WorkSafe requirements for management of the specific materials they are contracted to manage.

The following are the recommended approaches for managing the wastes and other materials that were identified during the site analysis.

The key principles that need to be adhered to are¹:

1. All hazardous wastes need to be correctly identified and managed in accord with all relevant legislation and Codes of Practices.
2. Hazardous materials need to be separated into their individual categories and not mixed with any other materials

Prior to commencing any demolition or clean-up activities, a Workplace Health & Safety Plan will be developed, implemented and monitored with all relevant site personnel receiving specific training in management of hazardous waste materials (including suspected hazardous materials).

In regards to potentially contaminated soil, a Remedial Action Plan is being prepared to ensure that this material is to be managed in accord with applicable regulations.

4.2 Asbestos

Process for managing materials that has been suspected of being or containing asbestos waste is as follows:

- i. Treat the material as asbestos unless proven otherwise
- ii. Do not disturb the material (ie., shift or place into a container) at all
- iii. Seek advice from a suitably qualified laboratory to test the material(s) to determine if it is or is not asbestos.
- iv. If determined not to be asbestos, then it can be managed as an inert waste.
- v. If determined to be asbestos then managed by a licenced contractor for packaging, removal and disposal.

¹ Reference should be made to the NSW EPA publication, Waste Classification Guidelines Part 1: Classifying Waste.

- vi. If the material has accidentally been uncovered, then the area should be cleared, barriers erected to prevent access, NSW WorkSafe and EPA notified, and if broken, covered with a fine spray/mist of water.

For what has been conclusively identified as asbestos containing materials (including soils), a specialist/licenced asbestos contractor will be used. As required, only workers trained in asbestos removal techniques will be allowed to manage the removal of asbestos contaminated soil and any contained on the buildings.

In regards to disposal of asbestos containing materials, there are regulatory requirements under clause 42 of the Protection of the Environment Operations (Waste) Regulation 2005 that apply to the management of asbestos waste, including:

- Waste must be stored on the premises in an environmentally safe manner.
- Non-friable asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soil must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- Asbestos waste must be disposed of at a landfill site that can lawfully receive this waste. Always contact the landfill beforehand to find out whether asbestos is accepted and any requirements for delivering asbestos to the landfill.
- It is illegal to dispose of asbestos waste in domestic garbage bins.
- It is also illegal to re-use, recycle or dump asbestos waste

These requirements will be adhered to.

5 Construction Waste Profile

5.1 Overview

The following summarises the types, quantities and management systems for construction materials that may be generated during construction.

The quantity of waste materials to be generated onsite are estimates 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.

Finalisation of the system(s) that will be implemented for the recovery of materials and for disposal of others to landfill will occur following appointment of contractor(s). A component of the appointment will be that contractors will be required to provide data as to the disposal pathway (eg., materials, volumes and final disposal site), as well as a validation process for this information.

The appointed contractor(s) will also be responsible for sourcing speciality recycling facilities for the materials that cannot be reused on site

5.2 Estimated Volumes

The following table details the estimated composition by m³ of construction waste to be generated for the total site.

Composition and Management of Construction waste by m³

Materials on site		Destination		
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Concrete	10 m ³	Separated on site and crushed for use in pavement construction where possible	Collected by contractor and disposed at concrete recycling facility	Facility TBA upon appointment of contractor
Asphalt	5 m ³	Separated on site and crushed for use in pavement and/or temporary access road construction where possible.	Collected by contractor and disposed at recycling facility	Facility TBA upon appointment of contractor. No disposal to landfill.

Materials on site		Destination		
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Excavation material (Top soil removal)	350 m ³	Will either be stockpiled for use during construction if required and if not disposed off-site.	Excavation materials will be collected and used as clean fill by the appointed contractor and/or forwarded to various facilities such as garden landscapers, or roadworks	Facility TBA upon appointment of contractor. No disposal to landfill.
Timber	35 m ³	Separated and where feasible, reused	Unused material separate and stockpiled onsite. Collected by specialist timber subcontractor for recycling	Facility TBA upon appointment of contractor
Bricks	2 m ³	Bricks will be stockpiled and reused wherever possible.	Acceptable quality bricks collected by a contractor and sold for reuse. Unusable bricks will be collected and recycled at an appropriate facility.	Facility TBA upon appointment of contractor. No disposal to landfill.
Plasterboard	20 m ³	No on-site reuse	Collected by the contractor for recycling	Facility TBA upon appointment of contractor
Metal	15 m ³	No on-site reuse	Collected by specialist metal subcontractor for recycling	Facility TBA upon appointment of contractor

Materials on site		Destination		
Type of material	Estimated volume (m ³)	On-site (Reuse or recycle)	Off-site	Disposal
Carpet	3 m3	No on-site reuse	This will be disposed of into a designated bin and collected for recycling if of the required quality or disposal to landfill	Facility TBA upon appointment of contractor
Glazing	1.5 m3	No on-site reuse	Recyclers consulted as to potential for recycling and if suitable separated for recycling	Facility TBA upon appointment of contractor
Mixed hard plastics	35 m3	No on-site reuse	Collected by contractor for recycling. Facility TBA upon appointment of contractor.	No disposal to landfill
Mixed Recyclables	55 m3	No on-site reuse	Contractor appointed to collect and recycle	No disposal to landfill
General waste	80 m3	No on-site reuse	No recycling or reuse	Facility TBA upon appointment of contractor

6 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.
- 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 below section.

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

7 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.