Construction and Demolition Waste Management Plan

Proposed Samuel Gilbert Public School Redevelopment

At Ridgecrop Dr, Castle Hill

On behalf of Fulton Trotter Architects

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

We have over 50 staff, with an unrivalled depth of experience. Our industry knowledge, technical expertise and commercial insight allow us to deliver an exceptional and reliable service.

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1. Introduction

1.1. Background

TTM Consulting has been engaged by Fulton Trotter Architects to prepare a construction and demolition waste management plan for the existing school (Samuel Gilbert Public School) redevelopment at Ridgecrop Drive, Castle Hill. Significant waste volumes can be generated during the construction phase and as such, this plan will assist to guide in reducing wastage and reusing materials.

It should be noted that the site currently has 12 demountable buildings which will be removed from site. Being demountable buildings, minimal demolition waste will be generated from the removal of these buildings and has therefore not been addressed in this report.

Construction wastes can include excavated materials such as soil, rocks, vegetation, building materials such as bricks, concrete, timber, fittings, plasterboard and also contaminated or dangerous materials such as asbestos and contaminated soils. Some of these wastes have particular handling, transport and disposal requirements, and all wastes have been identified by the NSW State government as having significant potential to contribute to the circular economy – recovering and recycling materials and reducing the need for virgin materials. As such, best practice waste management is required to not only comply with laws and guidelines, but also to contribute to improved environmental performance and also to reduce waste disposal costs.

The Hills Shire Council Development Control Plan (DCP) also identifies the importance of minimising waste to landfill and maximising recovery of resources from wastes from construction activities. As such, it is a requirement of The Hills Shire to develop and submit a waste management plan that discusses waste minimisation, reuse, recycling and disposal options for all types of waste, and that the WMP must be implemented throughout the development process. During construction, the WMP and proof of lawful waste disposal/recycling, must be retained on site in a Waste Data File. Proof is to include a log book with associated receipts/invoices, waste classification and site validation certificates.

This construction waste management analysis of the project has been undertaken to meet the requirements of The Hills Shire DCP – Appendix A Waste Management Plan. The goal of this document is in line with the DCP as well as the waste hierarchy (avoid, reduce, reuse, recycle, recover (energy), treat and dispose), shown in Figure 1.1, and aims to:

- Minimise the amount of waste generated;
- Maximise the reuse, recycling and reprocessing of construction waste materials; and
- Minimise the volume of material disposed to landfill.

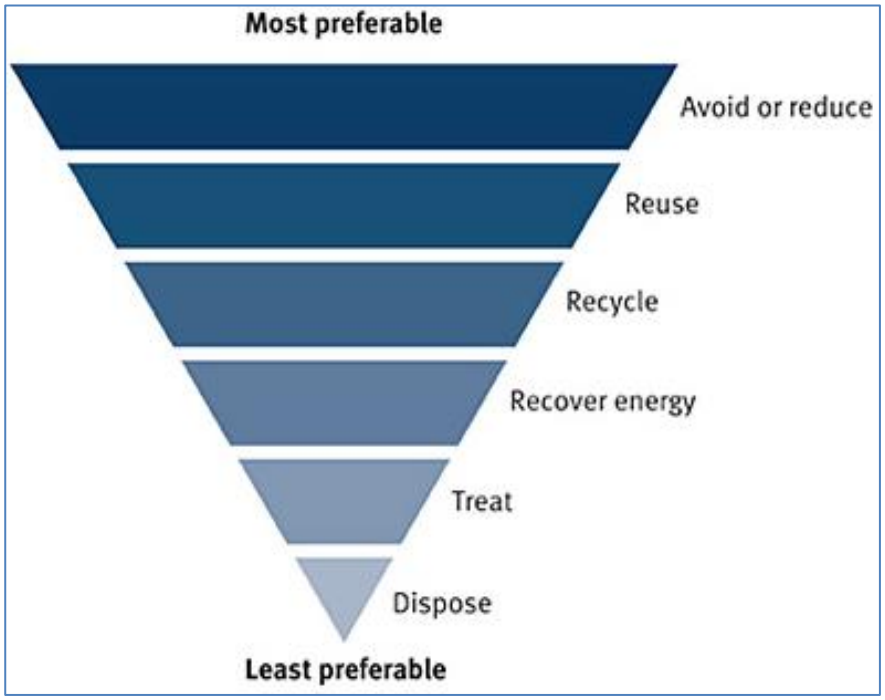

Figure 1.1 Waste Hierarchy

This report will provide guidance on activities and design before works on site commence, and will also outline the requirements to comply with Council and State legislation, and actions required during construction phases.

Information contained within the report is based on local government authority requirements related to The Hills Shire and the associated waste services department. The recommendations provided are designed to comply with:

- The Hills Shire DCP – Appendix A Waste Management Plan;
- NSW Waste Avoidance and Resource Recovery Act 2001 and Strategy 2014-2021.
- Any asbestos removal must be removed and disposed of in accordance with the requirements of Work Cover;
- All lead contaminated materials must be handled and disposed of in accordance with the NSW Environment Protection Authority's requirements.

This waste management plan relates to the construction phases only and does not include additional requirements during the operational phase of the development, which requires its own separate plan.

1.2. Site Location

The site is located on the corner of Ridgecrop Drive and Gilbert Road, as shown in Figure 1.2. The site has road frontages to Gilbert Road and Ridgecrop Drive, with the latter utilised for the service vehicle access. The site is currently operating as an educational facility.

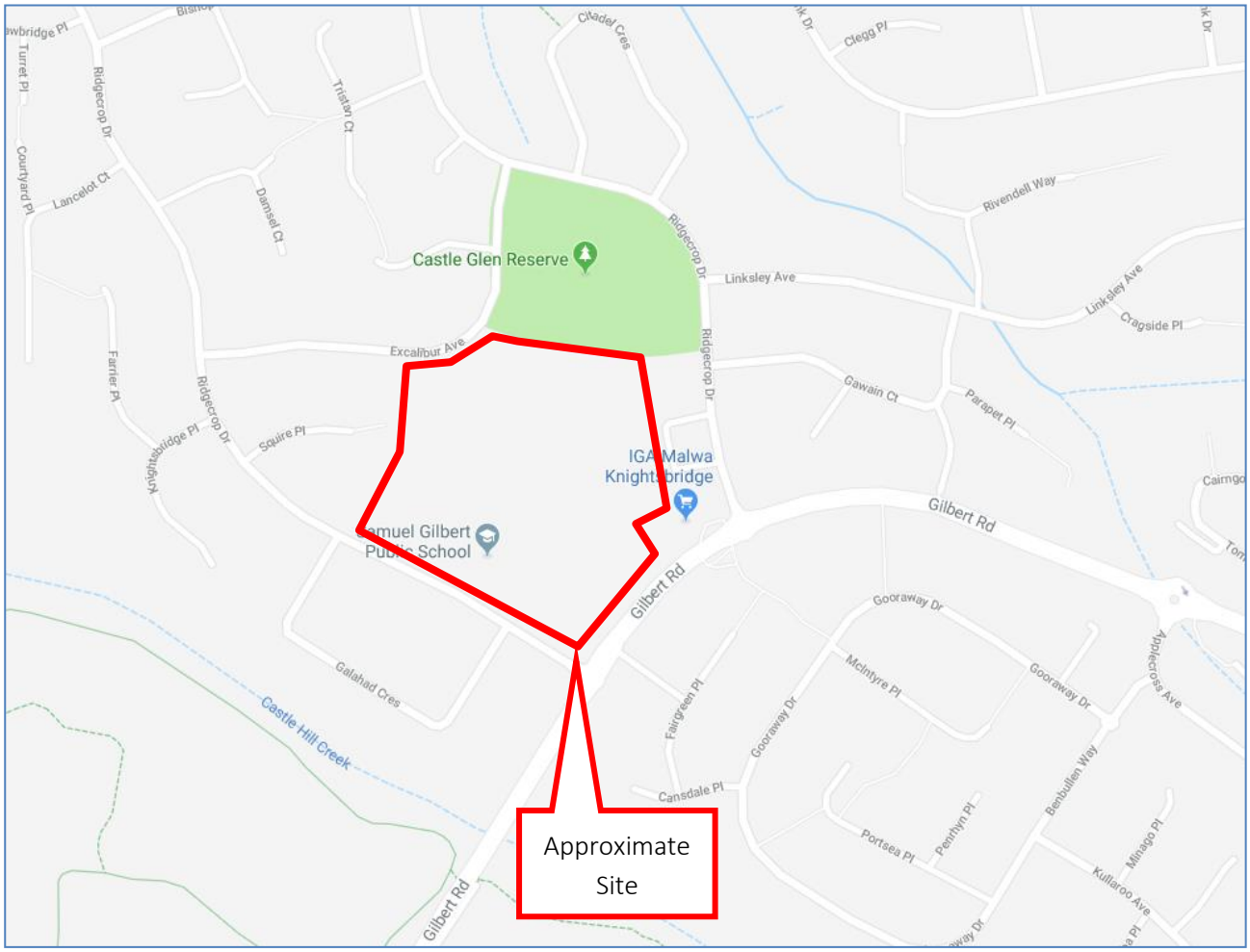

Figure 1.2: Site location

Figure 1.3: Site location

1.3. Development Summary

The development consists of an existing educational facility (school) including administration, classrooms, library and canteen areas.

The development proposal consists of removing 12 demountable buildings from an existing school, to provide 25 new teaching spaces totalling 43 permanent spaces, including a new hall, administration and home bases and cola catering for 1000 students.

The total GFA for the new buildings is 3974.2m^2 GFA, with 679.7m^2 GFA for the refurbishment buildings.

The construction of the new buildings mainly consists of glazing and metal deck roofing.

It is noted that all demountables will be removed at the completion of the project.

Note – the SSDA reports are based on the assumption that any new demountables required for construction would be on site and counted as existing for the purposes of the SSDA application.

2. Construction Waste Legislation

The transfer, transport and disposal of particular wastes have a range of legislative requirements that will need to be adhered to during the life of the project. This legislation has bearing on both the owner of the waste and the transporter.

Under Section 143 of the *Protection of the Environment Operations Act 1997*, waste can only be transported to a place that can lawfully accept it. If wastes are transported to a place that cannot lawfully accept the material, both the owner of the waste and the transporter can be held liable for clean up costs and for subsequent lawful disposal. Therefore, it is essential for the project managers/owners to ensure that due diligence is undertaken prior to transportation of waste materials. Additional measures owners of waste can protect themselves from fines and penalties are outlined at https://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition.

- It is recommended that a copy of this WMP along with proof of lawful disposal for all waste that is disposed of, or otherwise recycled from the site, be retained on site. Proof of disposal/recycling should to include a log book with associated receipt/invoices, waste classification, and site validation certificates. All entries should include:
- Time and date;
- Description and size of waste;
- Waste facility used;
- Vehicle registration and company name.

Both the logbook and associated receipts should be made available for inspection by authorised Council Officers at any time during site works and at the conclusion of works should be retained by the person responsible and made available for inspection by authorised Council Officers.

3. Planning for Construction

In order to achieve effective waste reduction during the construction phase, there are a number of measures that should be undertaken by the project manager, construction contractors, and site staff. A commitment to reducing waste sent to landfill will need to be agreed by all stakeholders and actions coordinated early in the planning phases, in order to achieve best practice diversion rates. These measures are discussed in the following sections.

3.1. Contractor Selection

The projects site performance relies on the attitudes of the chosen contractors (and construction), which will ultimately have a significant impact on waste performance of the site. Contractor tendering should include a requirement for all contractors to identify their waste minimisation strategies and actions, and outline the materials that they are likely to reuse on site, recycle through the supply of bins, or recycle themselves through product stewardship arrangements for specialty wastes, and those items that they regularly dispose of to landfill.

Contractors supplying goods and equipment should also document within the tender submission the methods they undertake to reduce overordering, the anticipated/known wastage, and other waste minimisation actions. As a minimum, all contractors should follow the intent of this WMP, and where not achievable, discussions with the Site Manager/Foreman must be undertaken and recycling contractors engaged to provide consultation on alternative solutions.

3.1.1. Education

Site induction of all construction site staff and contractor will include education regarding the importance of recycling and reducing the amount of waste sent to landfill. Induction will also include a familiarisation of appropriate bins and stockpiles, and an introduction of the person responsible for managing the wastes. It is important to ensure people continue to use the facilities as originally intended.

3.2. Material Identification

It is recommended that construction contractors meet with site managers to identify those materials or items that are to be salvaged or reused during the construction stage. All other materials should then be categorised based on acceptance criteria for available recyclers (see Table 6.1 and Appendix B). This presents a clear idea of those materials that are to be excluded from being sent offsite for recycling/reprocessing or for disposal to landfill.

In the absence of readily available data on anticipated volumes of waste materials from the construction of commercial buildings, TTM have estimated volumes by extrapolating data available on the construction of houses (and assumed that the current buildings requiring construction equate to approximately 7 residential houses). The resulting quantities are a guide only to assist in planning appropriate management solutions (access, bin capacity, training) for each of the waste streams.

Without knowing quantities of materials that will be brought on to site, it is difficult to accurately estimate volumes of materials that will require recycling or landfilling. Therefore, without this information, TTM have provided industry knowledge on wastage percentages of materials ordered, of regularly used construction materials in the table below.

Table 3.1: Anticipated Construction Waste Volumes (% of total material)

Material	Waste as a percentage of the total amount of material ordered
Timber	5-7%
Plasterboard	5-20%
Concrete	3-5%
Bricks	5-10%
Cladding*	5-15%
Roofing*	1-5%

*Assumed based on timber and plasterboard percentages.

Source: http://www.wastenet.net.au/Profiles/wastenet/Assets/ClientData/Document-Centre/WAL2708_Construction_waste_A4_v2_singles.pdf

To convert volumes to tonnages for these materials, use the following table.

Table 3.2: Construction Waste Volumes (Tonnes/m^2)

Material	Tonnes/m^2
Timber	0.5
Plasterboard	2.4
Concrete	1.0
Bricks	0.75
Cladding**	2.4
Roof**	0.5

**Assumed based on timber and plasterboard densities.

Source: http://www.wastenet.net.au/Profiles/wastenet/Assets/ClientData/Document-Centre/WAL2708_Construction_waste_A4_v2_singles.pdf

As anticipated volumes are currently unknown, it is essential that the construction contractor complete the table in Appendix B as soon as known quantities of materials are calculated. An estimation of volumes has been provided below, but is indicative only.

Table 3.3: Anticipated Construction Waste Volumes

Material	Estimated Qty – to be updated by construction contractor
Timber	2t
Plasterboard	10m^3
Concrete	10m^3
Bricks	30m^3
Cladding	10m^3
Roofing	5m^3

4. Construction

4.1. Construction Objectives

The key objectives for reducing total waste to landfill during the construction phase should be to:

- Minimise the amount of waste generated for the project – this should be the primary focus "waste avoidance";
- Maximise the amount of materials reused/salvaged, sent for reuse or recycling; and
- Minimise the amount of waste sent to landfill.

These goals can be achieved with the right planning, commitment, infrastructure and site preparation. The site foreman, and contractor representatives should be engaged early and clear guidelines on the expectations to minimise waste to landfill communicated.

4.1.1. Waste Avoidance

- Plan to use building materials with low wastage rates such as prefabricated or modular materials;
- Design using standard material sizes, reducing off-cuts and time and labour saving;
- Store materials appropriately from weather, accidents, machinery and theft;
- Regularly undertake stocktake checks to ascertain available resources;
- Check all goods upon delivery for defects and return to supplier – do not accept oversupply as compensation;
- Purchase materials or request materials to have no packaging where appropriate; and
- Support the purchase of recycled content materials.

4.1.2. Reuse

- Reuse materials identified in the pre-planning consultation with the Site Foreman and construction contractor;
- Identify and source other salvaged materials from salvage yards or look for bespoke items on for sale websites/pages; and
- Stockpile materials that can be reused in future stages or projects.

4.1.3. Recycle

- Provide bins for each material stream based on acceptance criteria from recycling contractors/s;

- Some contractors will provide mixed bins and they will undertake the sorting process within their facility – this may be particularly useful where available space or access is limited; and
- Remember to provide a comingled (mixed) recycling bin for staff to dispose of recyclables from lunches and packaging.

4.1.4. Contaminated Items

- Must go to appropriately licensed facility, with appropriately licensed transporter.

4.1.5. Landfill

- This should be a last resort option for those items that cannot be readily reused, recycled or reprocessed.

5. Waste Bin Guidelines

All waste containers/skip bins are to be positioned within the property boundary. Bins outside of the property boundary such as the roadway or nature strip may require a permit application to Council. Storage of skip bins/containers should be placed in a suitable location as to not cause disturbance to normal stormwater flow. Under no circumstances should hazardous, flammable or explosive materials be disposed of within skip bins.

All bins and stockpiles will be appropriately labelled, clearly visible to and from the property, easily accessible and stored in a well-lit area. It is proposed that bins and stockpiles will be located in close proximity to the existing refuse bin area (refer Figure 5.1).

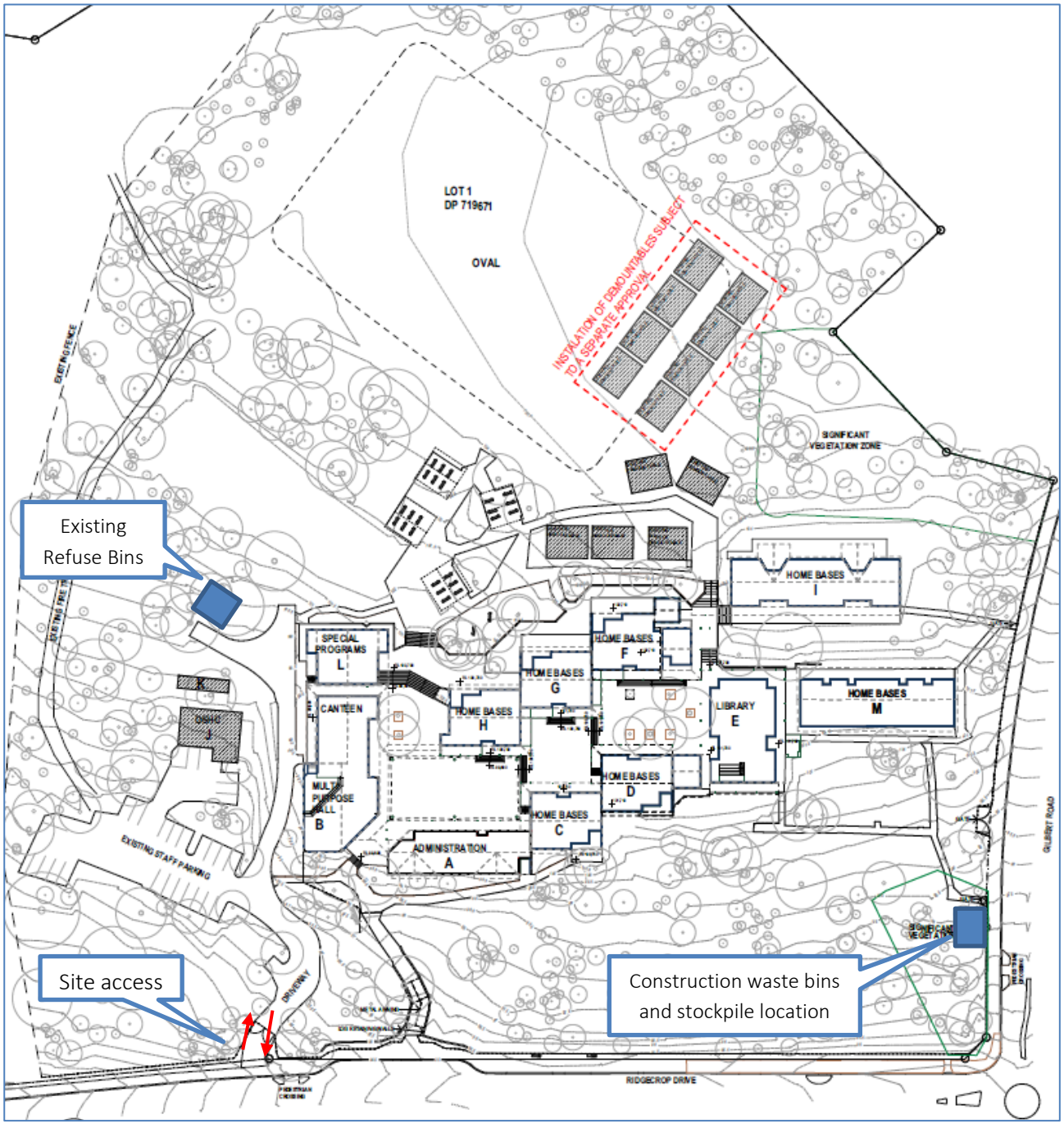

Figure 5.1 Proposed construction waste storage location and site access

Access to the construction area will be via Ridgecrop Drive. Each construction waste contractor has different collection methods, bins and vehicles and as such, the site foreman will be responsible for liaising directly with the contractors to ensure correct placement of bins/stockpiles to maximise safe access for both users and transporters.

6. Recycling Contractors

6.1. Recycling, Reuse and Recovery Guiding Principles

Reducing waste generation and keeping materials circulating within the economy are priorities for NSW. Through Waste Less, Recycle More funding, programs and services, the EPA is working hard to make it easier for businesses and communities to become better recyclers and reduce waste sent to landfill. On-site separation can reduce recycling costs and simplifies the sorting process.

6.2. Contractors and Services

The following is an indicative only list of Sydney based contractors that provide various services for handling the recycling, reuse and disposal of construction waste from the proposed project. This list has been assembled not in recommendation of any particular contractor but to demonstrate the general availability of recycling services around Sydney. The following larger waste transporters and operators are recommended:

Table 6.1: Recycling, Reuse and Recovery Services Contractors

Waste Material	Company	Description	Contact / Location Details
Concrete, blockwork, Bricks, Porcelain, Bitumen / Asphalt	Benedict Industries	Primarily a rubble recycling company but manages a wider range of waste streams as per below. Benedict will separate loads by hand or machine, screen some loads and crush masonry products. Non-recyclable elements will go to landfill. Materials accepted: • Clean concrete, blockwork, brick, mortar (masonry), porcelain; • Rubble+ soil; • Mixed load – concrete rubble and mixed in non-recyclables (incl mixed demolition waste, vegetation, timber, plastics); • Electrical cable; • Cardboard; • Clean timber; • Green waste; • Clean and laminated MDF, laminated timbers, stumps and plastics will generally go to landfill; • Steel loads – not mixed with other materials that requires sorting. Do not accept paints, liquids or food waste. Do not provide a bin collection service and are regularly serviced by bin suppliers and transporters such as: • Onesteel • Remondis • Reliance Skip Bins • Workhorse Waste and Recycling • Jims Skip bins • Vina Skip Bins • Brown Bros	A: Chipping Norton W: www.benedict.com.au Matthew Rooke E: matthew.rooke@benedict.com.au Ph. 02 9986 3500. M: 0431 737 444

	Bingo Industries	Primarily a rubble recycling service similar to Benedict however they also provide their own bins.	A: 305 Parramatta Rd, Auburn W: www.bingoindustries.com.au Ph: 02 9737 0351
	Boral Recycling	Provides concrete, asphalt, roof tiles, bricks and masonry blocks removal and disposal.	A: Wetherill Park W: https://www.boral.com.au/locations/boral-recycling-wetherill-park Ph. (02) 9604 9101
	Concrete Recyclers	Provides concrete, brick, asphalt waste removal.	A: 14 Thackeray St, Camellia W: www.concreterecyclers.com.au Ph: (02) 8832 7400
	Dial a Dump	Provides waste removal, waste management and waste transfer service.	A: 84-88 Burrows Rd, Alexandria W: http://www.dadi.com.au/recycling-landfill/genesis-eastern-creek
	Hi Quality	Resource recovery and recycling facility licensed to accept: • VENM; • Blast furnace slag; • Building and demolition wastes; and • Soils (CT1 thresholds); and • Organic wastes (mill wastes, green waste and wood waste).	A: Elizabeth Dr & Mamre Road, Kemps Creek W: http://www.hiquality.com.au Ph: 02 9826 1666
	Kimbriki Resource Recovery Centre	• Concrete; • Brick; • Asphalt; • Roof tiles Disposal facility only – requires use of transporter.	A: Kimbriki Rd, Ingleside/Terrey Hills W: Kimbriki.com.au Ph: 02 9486 3512
	M&K Demolition Group	Demolition, asbestos removal, strip outs and any other earthmoving service.	W: http://www.mkdemogroup.com.au/ Ph: Karl: 0404 429 995 Michael: 0404 222 995
Plasterboard / Gypsum	Bin only company	Rubbish removal (waste and recycling) from residential and commercial buildings, construction sites and deceased and hoarding affected estates.	W: www.1300rubbish.com.au Ph: 1300 78 22 47
	Gyprock	Only new, clean Gyprock product plasterboard waste is accepted. They do not provide bins.	A: Wetherill Park W: www.gyprock.com.au Ph. 131744
	ReGyp	Regyp provide and collect their own bins for new and old plasterboard per below: • Plasterboard and cornice off-cuts • Plasterboard with paint or wallpaper • Non-laminated plasterboard tiles • Gypsum blocks, gypsum prefab wall panels eg RFC rapid wall • Chemical precipitate gypsum (eg FGD) • Suitable industrial gypsum waste	A: Kurnell W: http://www.regyp.com.au/ Ph: 1300 473 497

	Remondis	Accepted materials: • Chemical & FGD gypsum • Scrap metal, • Organic waste, • Paper • Glass • Plastics	A: 32-36 Christie Street, St. Marys W:remondis.com.au Ph: +61 2 96234733 E: info@remondis.com.au
	Sydney Rubbish Services	Collection and removal of plasterboard and gyprock for delivery to recycling centre.	W: http://sydneyrubbishservices.com.au Ph: 02 9785 5526
Paints	paintback	Taking unwanted paint and packaging for innovative reuse and responsible disposal. Further information regarding acceptable paints can be found on the website.	W: www.paintback.com.au P: 1300 390 380
Metal - Metal recycling generally falls into ferrous and non-ferrous metal categories numerous recyclers exist to handle both types in mixed and separated loads	Benedict Industries	As above.	As above.
	Liverpool Scrap Metal – Mooreban k	Removal and disposal of scrap metal.	W: http://www.liverpoolscrapmetal.com.a u Ph. (02) 9602 4330
	Kimbriki Resource Recovery Centre	Scrap metal accepted	As above
	North Shore Metal Recyclers	Wire, copper pipe, plumbing fixtures, steel	A: Artarmon W: www.nsmr.com.au Ph. 02 9436 3000
	Onesteel Recycling	Mixed metals recycling, full site clean-up and bin services	A: Chipping North, Wetherill Park W: www.onesteel.com
	Remondis	As above.	As above.
	Veolia	All waste metal in large volumes.	W: https://www.veolia.com/anz/our-services/our-services/recycling-waste-services/construction-demolition-waste Ph. 132 955
Timber	Benedict Industries	As above.	As above.
	Kimbriki Resource Recovery Centre	Untreated unpainted timber	As above
Cardboard + Polystyrene	Brandown	Privately owned and operated Resource Recovery Centre, General Solid Waste (Non-Putrescible) Landfill and Quarry	A: Lot 90 Elizabeth Drive, Kemps Creek W: http://www.brandown.com.au/ Ph. - General Enquiries - 02 9826 1256
	Cleanaway	Sustainability for recycling, reuse, repurposing, treating or shredding across the following areas: • General Waste • Recycling • Hazardous Chemical Waste Disposal Services	A: Multiple Locations throughout Australia W: https://www.cleanaway.com.au/our-services/building-construction-scrap-

		• Used Oil and Oily Water • Construction and Demolition Waste	metal-and-timber-waste/ Ph. - General Customer Enquiries - 13 13 39
	Liverpool City Council	As above.	As above.
	Kimbriki Resource Recovery Centre	Cardboard and paper	As above
	Remondis	As above.	As above.
Soft plastics from packaging	Cleanaway	As above.	As above.
	Remondis	As above.	As above.
	Suez	Sustainability across the following areas: • Commercial Waste Management • Waste Removal & Disposal • General Waste Management • Commercial Waste Recycling • Advanced Resource Recovery Technology • Diversion Solutions • Households & Small Business • Collection & Disposal • General Waste Management • Skip Bins	W: http://www.sita.com.au/commercial-solutions/resource-recovery-recycling/construction-demolition/

Appendix A Construction Checklist

Waste and/or Recyclable Materials		Destination		
		Reuse and Recycling		Disposal
Possible Materials Generated	Estimated volume (m^3) or area (m^2) or weight (t) (Contractor to confirm)	On-site (How will materials be reused and/or recycled on-site?)	Off-site (Specify the contractor and recycling facility)	Specify the contractor and/or landfill site/transfer station
	Construction			
Timber				
Plasterboard				
Concrete				
Bricks				
Tiles				
Fittings				
Green Waste				
Asbestos (if any)				
Other (specify)				

How and where will materials be stored on-site for reuse and recycling? e.g. in skip bins located near entry.

How will site operations be managed to ensure minimal waste creation and maximum reuse and recycling? e.g. staff training, feedback from waste management service provider, on-going checks by site managers, separate area set aside for sorted wastes, clear signage for waste areas etc.

How will this plan be evaluated, and who is responsible for the evaluation? e.g. feedback from staff collected by the site manager.

Appendix B Action and Responsibilities During Construction Stages

Stage	Action	Responsibility	Checklist
Construction	Sourcing of recycling agents/contractors and transportation – gain an understanding of site access requirements and bin choices.	Project / Site manager	
	Installation of any barrier fencing to protect pedestrian safety, access pathways, and stockpiles to be protected/retained.	Project manager, site manager and construction contractor	
	Identification of best bin storage areas for the number of material streams and collection vehicle access, ensuring unimpeded access for users and waste collection contractors.	Project / Site manager	
	Installation of recycling bins.	Project / Site manager	
	Preparation of access points and installation of safety and educational signage at waste storage areas.	Project / Site manager	
	Site induction for all staff to include discussion on commitment to waste minimisation, reuse and recycling, available stockpiles of salvaged materials, how to use bins appropriately, and who to contact for any issues.	Site manager	
	Regular checks on bin capacity and scheduling of removal contractors.	Site manager	
	Waste information maintained and updated with each collection.	Site manager and construction contractor	