

Demolition & Construction Waste Management Plan

Education – St Peters Anglican College

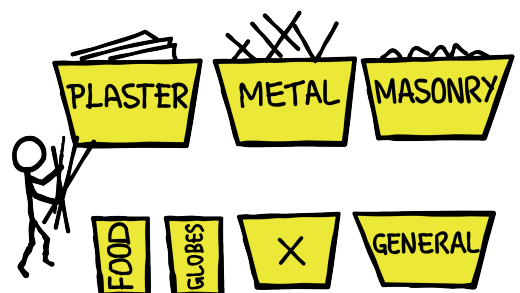
61 Train Street, Broulee NSW 2537

Prepared for: Anglican Diocese of Canberra and Goulburn

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Date: 29/7/2022

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Commercial waste calculations are based on rates provided by government organisations and adopted and used as an industry standard. Bin numbers and spatial requirements have been calculated in accordance with these guidelines. The end user requirements may vary from this depending on the business use, type and operational practice.

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 LID acknowledges and pays respect to the Australian Aboriginal and Torres Strait Islander people, to their ancestors and elders, past, present and emerging, as the traditional custodians of the lands upon which we work and live. We recognise Aboriginal and Torres Strait Islander people's deep cultural and spiritual relationships to the water, land and sea, and their rich contribution to society.

1 Recycling & Waste Management Plan

Low Impact Development (LID) Consulting was engaged by Anglican Diocese of Canberra and Goulburn to assess the proposed development at 61 Train Street, Broulee NSW 2537 to provide a Waste Management Plan (as required by Eurobodalla Shire Council's Statutory Planning).

A waste management analysis has been undertaken based on the following documents:

- Eurobodalla Shire Council's Site Waste minimisation and management Code;
- AS 2601 - 2001 Demolition of Structures, published by Standards Australia
- Code for the Control & Regulation of Noise on Building Sites NSW
- Environment Protection Authority Guidelines for Removal of Lead Paint & Asbestos
- Waste Avoidance and Resource Recovery Act 2001
- Contaminated Land Management Act 1997
- Refrigerant Handling Code of Practice 2007 (AIRAH/IRHACE)
- NSW Waste Avoidance and Resource Recovery Strategy 2014 – 2021

1.1 Development Outline

Site Address: 61 Train Street, Broulee NSW 2537

Applicant: Colliers

Type: Education

- Key Project Documents:**
1. DA-11-01, Revision 4, dated 28/7/2022 prepared by COX Architecture
 2. Site Survey Plan, Reference U18669-1 prepared by Rygate & West
 3. Traffic Impact Statement dated 25 July 2022 prepared by Stantec
 4. Environmental Site Assessment Report dated 30 June 2022 prepared by ACT Geotechnical Engineers Pty Ltd
 5. Tree Assessment dated July 2022 prepared by Harris Hobbs Landscapes



1.1.1 Existing Buildings and other structures:

- The subject site currently operates as an existing P-12 school; St Peters Anglican College.
- Located on the corner of Train Street & George Bass Drive Broulee, the site is in a regional town on the south coast of NSW.
- All of the existing structures on the site are single level and primarily comprise of a mix of brick and sheet metal clad buildings.
- There are a number of existing portable buildings that will be relocated off site for re-use.
- The existing vehicular access is vis Train Street. This will remain.
- The subject site is relatively flat.
- The existing buildings do not appear to be of heritage value.



Existing Admin Building to be demolished



Existing classroom to be demolished



Existing Carpark to be redeveloped



Existing Toilet block to be demolished

1.1.2 Brief description of proposal:

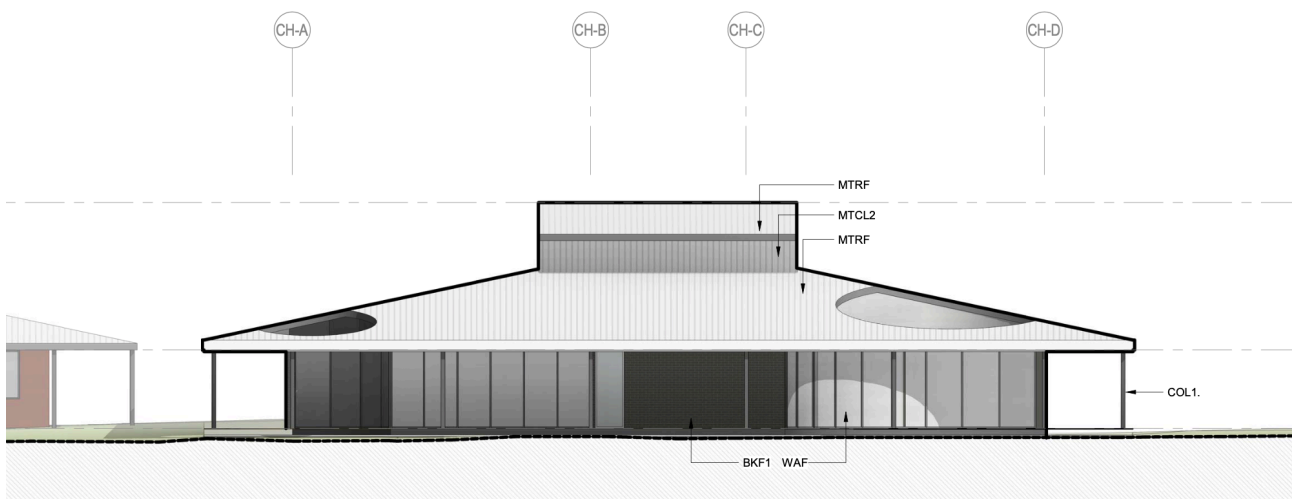
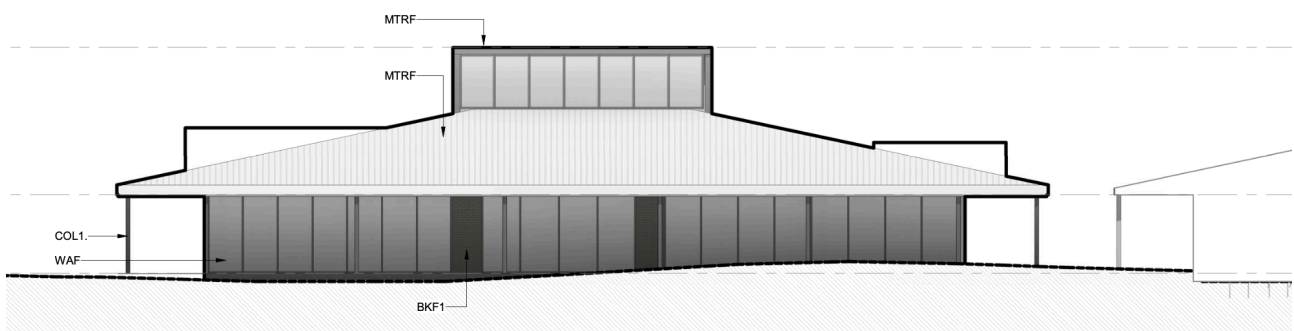
The proposed development looks to update and extend the existing school facilities as it expands over the next 10 years. The existing P-12 school accommodates approximately 600 students.

The proposed works include the construction of 4 new key facilities as outlined below plus a number of external landscape and sport structures. The expected student numbers are to rise to approximately 800 by 2034.

Proposed New Buildings

P7	Community Hub
P6	Music Centre
P10	Sports & Recreation Centre
P5	Junior Learning

The details provided in this report are the recommendations for better practice management of demolition and construction waste. Generally hand/manual demolition is proposed to effect better recycling and re-use rates. Separation of waste streams is also preferred for improved recycling of excess construction materials and is considered practical given the size of the site and project.



1.2 Waste context

Australia generated 75.8 million tonnes of solid waste in 2018-19, which was a 10% increase over the last two years (since 2016-17).

Sectors generating the most waste were:

- Manufacturing: 12.8 million tonnes (16.9%)
- Construction: 12.7 million tonnes (16.8%)
- Households: 12.4 million tonnes (16.3%)
- Electricity, gas and water services: 10.9 million tonnes (14.4%)

Construction

- 16.8% of total waste
- Largest supply of masonry materials (8 million tonnes), 35% of all masonry material waste
- \$2 billion spent on waste services
- Construction waste increased by 22% since 2016-17¹

The intent of demolition and construction waste management plans is to assist in reducing this.

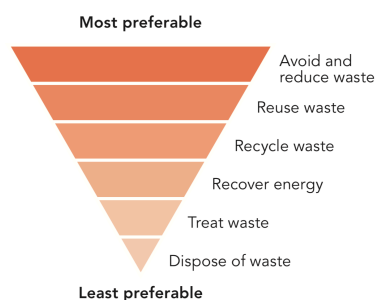
1.3 Actions for Good Waste Minimisation

Principles for good waste minimisation have generally followed the waste hierarchy framework shown as the inverted triangle below (from the Environmental Protection Act 2017).

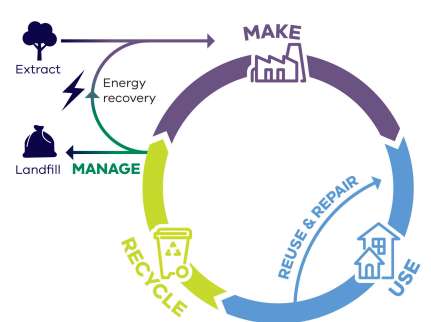
In recent years the concept of waste reduction has also been presented through a circular economy discussion. Both concepts are current, but a circular economy process aims to shift thinking from the predominantly linear model of “take, make and waste” that we have seen in the last few decades and that leads to resource and environmental depletion, to a system where products and services are designed to be reused or ideally be regenerative i.e. to repair the environment.

Further, a circular economy allows waste to be avoided in the first instance to reduce environmental impacts of production & consumption. There is now an increasing focus on this across Australia and around the world. More information can be found at the Australian Circular Economy Hub <https://acehub.org.au>

Waste hierarchy



Circular Economy



¹ <https://www.abs.gov.au/statistics/environment/environmental-management/waste-account-australia-experimental-estimates/latest-release>

Design for retaining and reusing materials

An important component of the circular economy is designing out waste and pollution. Increasing reuse and recovery activities minimises the number of resources used and avoids the generation of waste.

This project design presents many positive resource reuse and retainment opportunities. Retaining a large portion of the brick internal and external walls saves energy and material use and avoids waste as part of the highest component in the waste hierarchy.

Waste minimisation on site

The following measures help to ensure reduced site waste to landfill:

1. **Selection of head contractor** - demolition, excavation and/or construction
 - a. Contractors waste minimisation strategies should be detailed and specific.
 - b. Favour demolition contractors who undertakes significant demolition by hand rather than excavator.
 - c. A Greenstar experienced contractor and waste processing facility is preferred. Both should hold a Green Star Compliance Verification Summary issued by a suitable qualified auditor, confirming compliance with the Green Star Construction and Demolition Waste Operational and Reporting Criteria.
2. **Inclusion in all site inductions** of a discussion of the intent to recycle and minimise waste.
3. **Inclusion in contract conditions** for trades to minimise waste. Measures that change of contractor behaviour include:
 - a. plasterers supply their own plasterboard recycling bins.
 - b. other trades such as studwork framers and electrical supply their own bins and clean up their own work at the end of the day, placing waste into their own bins – specifically timber or metal stud off cuts or cabling for recycling. Selection of demolition, excavation and head construction contractor. Contractors waste minimisation strategies should be detailed and specific.
4. **Keeping a waste register** that records waste types and volumes as they leave the site as required by Councils DCP (Development Control Plan).
5. **Supervision and monitoring of waste bins** and enforcement of separation of waste types
6. Active waste separation of waste streams - During construction ensuring the labourer stockpiles materials suitable for re-use in work locations daily.
7. **Bins with lids** on for workers food waste and wrappers or other waste that may blow out of bins and around on site. Reduces contamination of other recycling loads. Selection of demolition contractor who undertakes significant hand demolition rather than demolition by excavator.

1.4 Risk Review

Per industry practice detailed, specific risk assessments should be prepared by the individual contractors responsible for demolition, excavation, the construction of the structure, services, fitout and finishes phases. The risk assessments should take into account but not be limited to waste related activities such as below:

- Worker, pedestrian and traffic hazards created by movement of waste to waste bins and movement of waste bins and vehicles on and off site.
- Excavation risks
- Safe handling of hazardous and toxic waste materials if they are identified on the site, such as asbestos.

2 Demolition & Construction Waste Details

This section details of Council's requirements in relation to demolition and construction waste management plans. Also provided are additional details which may be of assistance in minimising and managing demolition and construction waste.

2.1 Eurobodalla Shire Council DCP

In accordance with the DCP Code, the following demolition & construction waste management plan is to:

- To minimise resource requirements and construction waste through reuse and recycling and the efficient selection and use of resources.
- To minimise demolition waste by promoting adaptability in building design and focussing upon end of life deconstruction.
- To encourage building designs, construction and demolition techniques in general which minimise waste generation.
- To maximise reuse and recycling of household waste and industrial/commercial waste.

2.2 Additional Council Bin Permits

Waste bins are proposed to be fully within the fenced off-site boundary. Should additional waste skips be required outside of the property on the roadway or nature strip a permit would be required from council.

2.3 Waste Register

Council requires a register is to be kept for recording types and quantity of waste taken off site, waste contractor used and destination for the treatment or disposal of the waste.

Monthly waste and recycling contract reports provided by the waste processing facilities, indicating the amount of waste received, and a breakdown of materials recycled or sent to landfill will form the basis of the waste register.

The register should also include tracking of contaminated wastes generated on site that include but may not be limited to:

- Contaminated soils
- Materials containing asbestos or older electrical equipment including lighting controls containing PCBs (possible within garage building on site)
- Waste oils, oil and fuel filters from machinery used on site, oily water
- Solvents, paints and adhesives and their containers

2.4 Accurate Estimation

The design involves common construction methods and can be readily estimated with accuracy by experienced contractors for material take-offs.

Careful estimation, ordering and prefabrication offsite prior to site construction will ensure that minimal excess material is wasted and that variations on site that result in waste are minimised.

2.5 Waste Charges by Volume & Weight

Most demolition and construction waste is charged by volume (set price for the bin or per standard size truck), and also by weight. This means that even some lightweight voluminous products are expensive to be disposed of – which may improve the incentive to recycle more. For example PVC pipe can take up a large volume and fill bins quickly. Utilising recycling of good volumes of clean PVC pipe is a smart move to save on the number of waste bins or trucks.

2.6 Site Training in Waste Management

All contractors on site should be trained in the contents of this waste management plan as part of site induction procedures, to maximise the use of recycling storage provided on site and the diversion of demolition and construction waste from general landfill.

2.7 Pollution Control Measures

Pollution control measures should be identified and documented, prior to work commencing. This should identify where pollution control measures will be installed, and how erosion and loose waste will be managed.

- Examples of measures follow:
- Capping / properly sealing off all pipe ends to underground stormwater and sewer connections either at ground level, as the pipes leave the site or at the mains.
- Drain filters/sediment traps in front of side entry pits or over grated pits (see image below)
- Silt fences on the down slope side of the site where the site has a slope steeper than 1:20 (see image below)
- Silt bunds in swales to retain site erosion materials but allow water flow through
- Erosion control blankets over mounded earth
- Installation of tarps/coverings on site waste bins during non-work hours to prevent blown material leaving the site.



Example – Silt Fencing



Example – Drain Filtering / Sediment trap

2.8 Runoff, Spills, Siltation & other Pollutants

Suitable measures are to be taken to ensure the possibility of pollutant runoff from the site is contained and managed. Containment fencing and silt management measures at the boundaries are recommended.

Once excavation is below street level run-off externally from the site should not occur. Ground infiltration could still occur but should be minimised if onsite water is minimised.

Following are some indicative measures that can be implemented for runoff management and spill containment.

2.9 Vehicle Spills

Spill and sediment tracking off the site from vehicles leaving the site should be managed to minimise pollutant and sediment loads that could otherwise enter street stormwater catchment.

2.10 Truck / Bin Clean-up

For the majority of the work, demolition will be carried out on a concrete pavement. Trucks will need to be inspected to ensure broken glass, shards of metal and brick rubble is not transported off-site on to the roadways.

During the excavation works trucks will potentially collect soil on wheels.

The use of crushed rock on internal roadways will reduce this, as will the use of rumble grids. Washing down trucks and storage bins prior to leaving site is another method that may be required to prevent silt and pollutants leaving the site, All measures reduce the need to clean down roadways.

2.11 Demolition & Excavation Stage

The following outlines the general sequence and waste streams identified for the demolition and excavation phase and recommends appropriate methods for recovery and disposal.

2.11.1 Contractors

Separation on site is the simplest way to reduce recycling costs as it simplifies sorting of waste at the processing yard. In most cases mixed loads of recyclable and non-recyclable products that requires extensive sorting can incur a very significant premium price compared to a site pre-sorted load.

In NSW there is currently a requirement that waste operators and transporters that receipt more than 5,000 tonnes per year be EPA NSW licensed and therefore under greater EPA scrutiny. Accordingly larger waste transporters and operators are more likely to be living up to their commitments. (The Waste Management Association of Australia – WMAA is looking to also have this threshold reduced to 1000 tonnes).

The choice of demolition and excavation contractors and attitude to waste has a significant impact on the waste performance of a project site. Tendering contractors should identify their planned waste minimisation strategies. Waste minimisation strategies should identify which products are to be recycled and where they are to be taken to, and which are not to be recycled and where they will be sent.

The demolition and excavation contractors are to confirm or improve on re-use or recycling options in this plan, or document an explanation if otherwise.

2.11.2 Sequence

The general sequence to be followed for completing the demolition and excavation stages is as follows:

1. Installation of hoardings & fencing and boundaries to protect the public and significant vegetation.
Checking to ensure existing fences are sufficient and complete to prevent un-authorised public access.
2. Installation / identification of access roads, washdown and other site safety protection measures

3. Asbestos and hazardous materials removal. If hazardous materials are detected a these will be removed by accredited contractors.
4. Cut and seal all redundant services
5. Remove relocatable buildings off site for re-use.
6. Demolition methods
 - o By hand or machine – vegetation – minimal.
 - o By hand - Services - to be disconnected and terminated by licensed contractors
 - o By hand - Windows and glass panels to be removed separately
 - o By hand - Fixtures & fittings (doors, cabinets, sanitary-ware, skirting, architraves etc.) to be dismantled and removed
 - o By hand or machine - Roof sheeting / tiling to be removed
 - o By hand or machine - Plasterboard removed
 - o By hand or machine - Roof timbers, floor & wall framing removed
 - o By machine - Bricks and concrete dismantled and removed
7. Demolition of existing buildings
 - o All demolished materials are to be moved to the waste bin storage area with subsequent separation and loading of material into separated bins for recycling as appropriate – See Table 1.
 - o Much of the demolition would occur mechanically as would separating demolished materials for loading into trucks and removal to recycling yards as appropriate – See Table 1.
8. Excavation
 - o Top soil can be stockpiled on site in the north west corner – confirm on site.
 - o Assume 150mm topsoil removal for the building area plus 20% for adjacent levelling. Cut volume is increased further by 40% for a loose earth bulking factor) based on finished levels shown but excluding over-excavation and ramps etc.
 - o The fill material should be inspected with the hope that it can again be sent to a clean fill site for re-use.

2.11.3 Contaminated Land

No contaminated soil has been identified on the site with no historical evidence likely – refer Environmental Site Assessment Report dated 30 June 2022 prepared by ACT Geotechnical Engineers Pty Ltd

Should any contamination be suspected during demolition and after demolition and excavation has commenced it is to be remediated and disposed of to an approved contaminated/remediated soil facility per the Contaminated Land Management Act as required by NSW EPA.

2.11.4 Contamination & Hazardous Materials

Any contaminated and hazardous materials found on site during demolition should be removed and disposed of in the authorised manner. Refer to the Demolition Phase/ Hazardous Materials section for procedures and indicative locations of asbestos.

Sampling may be required during demolition. If asbestos is found an approved licensed removal contractor will be engaged to remove the product with air monitoring undertaken throughout the process. Details of removal procedures and risk management will be detailed in the Hazardous Building Materials Assessment Report.

Any previously unidentified suspected asbestos material identified during the demolition should halt works until such time the material can be inspected and classified by an experienced consultant.

Asbestos is commonly contained in older buildings built prior to 1985 and may occur in the following locations:

- Cement sheet walls
- Backing to floor tiles
- Lagging insulation for hot water pipes
- Backing to old switchboards
- External cladding (Fibro)
- Corrugated cement sheet roofing

2.11.5 Refrigerant Removal

Air-conditioners on site are likely to have CFC (Chlorofluorocarbons), HCFC (HydroChloroFluouroCarbons) or HFC (HydroFluouroCarbons) as the refrigerant. These refrigerants are either very harmful to the ozone layer or very significantly greenhouse gas contributors. If units are not disposed of properly, refrigerant may escape into the atmosphere, contributing significantly to global warming. CFC and HCFCs have been banned for a while now. The alternative, HFCs are being gradually phased out. The federal government has started to cap the amount of refrigerant using HFCs that enters Australia as a start to outlawing such refrigerants including the common R-410A.

<http://www.environment.gov.au/protection/ozone/hfc-phase-down/hfc-phase-down-faqs>

Before disposing of air conditioners, all units are to have the refrigerant 'recovered' by a licensed Australian Refrigeration Council (ARC) member technician <https://www.arctick.org/>. ARC members must hold a Full Refrigerant and Air-conditioning (Full RAC) licence or Restricted Refrigerant Recoverer licence (RRRL).

The recovered refrigerant is generally returned to a refrigerant gas retailer or wholesaler who will recycle the gas if possible. Where maintenance regimes have not used the manufacturers recommended gases or have used different gases over time, the refrigerant is less likely to be recyclable. If recycling is not possible, when enough gas is collected the retailer/wholesaler will forward the gas to the refrigerant gas product stewardship organisation Refrigerant Reclaim Australia (RRA) <https://refrigerantreclaim.com.au/>. RRA has a facility in Melbourne (the sole approved facility in Australia) for destroying refrigerant gases in an environmentally friendly manner. Gas is sent to this facility from all over Australia.

This scheme operates under the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989, and regulates the handling, trade and disposal of refrigerants which are ozone depleting and synthetic greenhouse gasses.

Without an appropriate licence, operators are operating illegally.

2.11.6 Trees

There are a number of trees to be removed and many may need protecting as shown on the demolition plan. No Arboricultural report had been completed at the time of writing this report. However, a tree assessment has been carried out by Harris Hobbs Landscapes. The contractor is to coordinate all protection of existing vegetation prior to commencing works.

2.11.7 Window Audit

An audit must be taken of all windows to be removed for demolition, to enable the sale of windows not required. This should include:

- the outside dimensions of each window,
- confirmation of the frame type (aluminium, timber, PVC, or composite, domestic, semi commercial or commercial, fixed glazed, awning, sliding, bifold),
- glazing type (single or double glazed, clear, tinted or low e), and
- a picture for each window.

This audit must be undertaken two months before demolition is scheduled to commence and the items be placed on a marketplace website (such as Gumtree, Freecycle, Zilch, Oz Recycle etc) for sale or take away for free. This audit may need to be undertaken by the project design team.

2.11.8 Materials to be Recycled

All materials suitable for recycling must be forwarded to an appropriate registered business to the satisfaction of the Principal Certifying Authority.

2.11.9 Table 1 Demolition phase waste analysis – Site Establishment, Demolition, and Excavation

Materials on Site			Destination		Contractor#
Type of Material	Location / examples	Estimated Qty – TBA by contractor	Reuse and recycling	Disposal	Operating in the local area
Concrete	Ground slabs, driveways, paving	60m ³ approx	<ul style="list-style-type: none"> Removal and delivery to recycler for filling, levelling material, road base 		Surf Beach Waste Management Facility
Bricks / masonry	Brick walls and blockwork.	36m ³ approx	<ul style="list-style-type: none"> In the event that the mortar is able to be separated from the bricks then there is opportunity for reuse of the bricks in external construction. Alternatively, in the event that the demolished brick cladding will not be in a feasible condition for re-use; there is opportunity to recycle crushed brick into other building materials. Demolished brick walls will need to be broken down into suitable sized pieces (as accepted by recycling contractor) and transported to a concrete recycling facility. 		Surf Beach Waste Management Facility
Hardwood timbers	Studs, framing, hardwood floorboards	16m ³ approx	<ul style="list-style-type: none"> Reclaimed for second hand timber suppliers OR reused on site as flooring, fencing, furniture. The hardwood floorboards are a high value item and should be separated and sold. Re-used on site as formwork, bridging, blocking & propping &/OR reclaimed 	Woodchipping for mulch	Surf Beach Waste Management Facility

			<ul style="list-style-type: none"> by second hand timber suppliers Floorboards in good condition to be hand recovered and collected by recycled timber /building products contractor Mulching by Waste contractors 		
Other timbers	Architraves, skirtings, floorboards stud walls, timber bulkheads, cabinetry, balustrades	8m3 approx	<ul style="list-style-type: none"> Re-used on site as formwork, bridging, blocking & propping &/OR reclaimed by second hand timber suppliers Mulching by Waste contractors 		Surf Beach Waste Management Facility
Metals	metal roofs, roller doors, fences, sinks, baths, copper and brass pipes, chrome fixtures, shop fittings,	21m ³ approx	<ul style="list-style-type: none"> Any metal from structures on the existing site and delivered to metal recyclers Shop Fittings can be sold on second hand websites such as Gum Tree and Greys Online. Copper and older iron piping in good condition to scrap metal merchant. Brass, stainless and chrome tap ware accepted by some merchants. 		www.Gumtree.com www.Ziilch.com www.Greys.com Surf Beach Waste Management Facility, Veolia
Other Metals	a/c ducting, sinks, baths, chrome fixtures, light fittings, Metal Ceiling grid, metal ceiling grid hangers, metal studs, A/C units, Rigid A/C Ducting, Cool Rooms, refrigerators, metal door frames, garage roller doors,	6m ³ approx	<ul style="list-style-type: none"> Any metal from structures on the existing site and delivered to metal recyclers Brass, stainless and chrome tapware accepted by some merchants. Heating units can be recycled. Non-ferrous metals is recyclable. Corroded / poor condition piping, ductwork and other metals may need to be sent 	Disposal of Refrigerant from AC needs to meet EPA standards.	Surf Beach Waste Management Facility, Veolia

			to either a mixed recycling waste facility or landfill as appropriate.		
Windows	Timber and aluminium windows, shopfront windows	6m ³ approx	<ul style="list-style-type: none"> Limited potential with second hand building suppliers. Will be advertised on second hand market websites prior to demolition. Potential re-use as glazing OR crushed for aggregate in concrete production. Some windows are double glazed, the older windows are single glazed. 	Separation of glass and framing is generally not economic so not commonly undertaken.	Surf Beach Waste Management Facility
Timber Doors	Internal doors	2m ³ approx	<ul style="list-style-type: none"> Limited potential with second hand building suppliers. Muched up for use – eg BioGrow type use or painted MDF acceptable 	•	
Lights	Fluorescent, Downlights, Oyster	40 No approx	<ul style="list-style-type: none"> Lightweight Steel sheet in fixtures Copper Cabling PCB's Fluorescent tubes Non-ferrous metals Steel sheet and castings recycled Copper Cabling recycled Mercury collected for medical industry. 	Landfill. Disposal of Fluorescent tubes needs to meet EPA requirements,	Ecocycle, Liverpool Community Recycling Centre, Lamp Recyclers Surf Beach Waste Management Facility
Vitreous china	Toilets, shower bases, vanities	toilets/bsins/showers	<ul style="list-style-type: none"> Crushed up and mixed with masonry products 		Surf Beach Waste Management Facility
Plasterboard	Internal Walls and ceilings	16m ³ approx	<ul style="list-style-type: none"> Plasterboard recycling service 		ReGyp
Rigid PVC	Downpipes, conduit.	2m ³ approx	<ul style="list-style-type: none"> Clean rigid PVC pipe and conduit can go be recycled. 	<ul style="list-style-type: none"> Landfill 	Ipex Pipelines

			<ul style="list-style-type: none"> PVC sheathing around electrical or data cabling not accepted 		
Foil Insulation	Roof Insulation	4m ³ approx	<ul style="list-style-type: none"> If insulation is over 40 years old it is unlikely to be recyclable. 	<ul style="list-style-type: none"> Landfill 	
Cabling	Electrical, IT	1m ³ approx	<ul style="list-style-type: none"> Non-ferrous metals are accepted at recyclers. 		Benedict
Floor, wall & window finishes	Carpet, carpet squares, underlay, tiles, lino floor tiles, Soundproofing panels.	12m ³ approx	<ul style="list-style-type: none"> If in reasonable condition advertise on Gumtree for larger runs, make available to community groups Curtains can be recycled as painter's rags and painter's furniture protection. 	<ul style="list-style-type: none"> Landfill 	www.Gumtree.com www.Ziilch.com
Excavated fill	Topsoil to be re-used on site. Excavated fill for footings, slabs, trenching.	3,000 m ³	<ul style="list-style-type: none"> Excavated fill is often able to be re-used so long as the fill is clean and uncontaminated. Excavated fill can often be used on construction projects by the main contractor or external contractor, depending on the project subsequently occurring at the time. 	If no avenues for re-use, or if the fill is unclean or an insufficient soil type, it may be disposed of in a commercial landfill site.	Use on site where possible, Surf Beach Waste Management Facility

For further information regarding each contractor refer to the Waste Contractors section of this report.

2.12 Construction Stage

For Bin Placement and Vehicle Collection Path see: Appendix 1 Demolition and Construction Waste Bin Collection Location Plan.

2.12.1 General Waste Percentages

'Rule of Thumb' for renovations and small home building

- Timber 5-7% of material ordered
 - Plasterboard 5-20% of material ordered
 - Concrete 3-5% of material ordered
 - Bricks 5-10% of material ordered
 - Tiles 2-5% of material ordered
- Source: Waste Planning Guide for Development Application, Inner Sydney Waste Board, 1998

2.12.2 Contractors

The choice of head contractor and attitude to waste has a significant impact on the waste performance of a building site. Tendering contractors should identify their planned waste minimisation strategies. Waste minimisation strategies should identify which products are to be recycled and where they are to be taken to, and which are not to be recycled and where they will be sent to.

The construction contractor is to confirm or improve on re-use or recycling options in this plan, or document an explanation if otherwise.

Table 2 below outlines the waste streams identified for the construction stages and recommends appropriate methods for recovery and disposal to be followed, particularly where individual trades contractors are to be appointed.

2.12.3 Construction System & Take-offs

Items to be pre-fabricated off-site in controlled yards or factories and delivered complete to site will reduce on-site waste significantly. Pre-fabricated products include:

- Precast panels
- Roofing sheets cut to length
- Windows
- Joinery
- Screens

Further; waste is generally reduced at off-site fabricators for economic benefits.

Contractors can further reduce waste by the selected building system. Pre-cast panels generate less waste than blockwork structures. Prefabricated walls reduce waste in comparison to site built framed walls.

In-addition careful and accurate ordering of materials, along with clean-up and retention of re-useable materials will assist to reduce on-site waste.

2.12.4 Waste Recovery by the Public

Timber stud offcuts will be re-used where possible (a good labourer stockpiling materials in work locations can help re-use of materials) or stockpiled for the public use or recycled as timber mulch.

2.12.5 Waste Container Guidelines

All waste containers / skip bins are to be clearly visible, accessible and labelled in a well-lit area to ensure use.

No hazardous, flammable or explosive materials are to be disposed of within skip bins. Storage of skip bins is not to cause disturbance to normal stormwater flow.

2.12.6 Contamination of soil during construction

Contamination of soil or surrounding spaces, which then needs to be removed off site, often occurs and can be addressed in the following ways in *italics*

- small items such as discarded fasteners, food scraps packaging and straws – *locate small easy to find bins with lids around the site*
- broken polystyrene – *cut and sweep up immediately then place in bins with lids*
- rubble mixed into soil that might otherwise become a garden bed – ensure crushed rock for ground stabilisation is placed in locations that will be covered by paths and not garden beds.

2.12.7 Sequence

The general sequence to be followed for completing the construction stages is as follows:

1. Foundations and carpark construction

Expected to include in-situ poured concrete footings and carpark slab

- Slab in situ concrete - Experienced concreters order loads accurately, ordering on a load by load basis near the end of the pour. Waste concrete would be a fraction of one load per pouring day i.e. approx. 1-2m³ at most on the last delivery of the pour. Waste is to be crushed and used for ground stabilisation, behind retaining walls as broken up aggregate, or removed and crushed for re-use in road base or similar.

2. Upper structure construction and windows

Expected to include blockwork/brickwork, or timber and plasterboard party walls, steel columns and/or beams, timber floor joists and flooring or poured concrete slabs, timber or metal wall framing and aluminium windows.

- Blockwork/brickwork and mortar waste will be minimal and can be reused in other locations on site, or recycled off site.
- Structural steel will be ordered to length to minimise offcuts.
- Timber joists will be ordered to length to minimise offcuts.
- Timber chipboard or similar flooring will go to landfill waste.
- Maximum waste anticipated from poured concrete slabs would be no more than 1m³ per floor, to be spread and crushed for re-use on site as base for pedestrian paving, road base or similar.
- After stripping, formwork is cleaned in most cases and where possible, reused again. It is in concreters financial interests to re-use formwork. Residual formwork offcuts will be placed in general waste to landfill.
- If used timber stud offcuts will be re-used where possible (a good labourer stockpiling materials in work locations can help re-use of materials).

- Damaged or off-cut metal stud framing to be recycled in metals bin on site.
- Windows come to site prefabricated so only generate waste from plastic, cardboard and timber protective packaging. Separate cardboard and plastics bins or enclosures should be provided to capture this waste.

3. Roof

Metal roofing is usually cut to size to reduce off-cuts on site and improve the finishes of edges.

- Metal sheet, guttering offcuts, damaged downpipes can easily be recycled.
- Installation of the ground level downpipes should be delayed until the end of the job to reduce the chance of damage. Temporary plastic downpipes reduce wastage of metal downpipes, and can be re-used.



4. Services installation

- Installation of electrical systems. Wire waste should not end up in general waste bins on site but should be removed, stored and sent for recycling of the copper.
- If installed, leftover steel pipe offcuts from the fire system can be recycled.
- Plumbing and drainage would include water, sewer piping, and PVC drainage pipe installation. Accurate ordering of quantities will ensure minimal pipe waste. If clean-up is thorough, some pipework can be recovered for use on other jobs. Significant volumes of clean PVC drainage pipe can be separated for collection and may be recovered for granulation and reuse. Otherwise it may be disposed to landfill.
- Waste solvents from PVC drainage gluing are to be tracked in the contaminated waste register and disposed to a suitable landfill for solvent container disposal.

5. Cladding and fitout

Application of external and internal linings: including external cladding and features, awnings, plasterboard linings, insulation.

- Lightweight steel battens for supporting cladding fixed to the outside of the frame will be recyclable.
- Cement sheet cladding or composite cladding materials will go to landfill.
- Aluminium timber look battens will be fixed to the outside of the building. These will be recyclable.
- Aluminium louvers will be fixed to the outside of the building. These will be pre-cut offsite and generate minimum waste on site.
- Masonry type cladding materials will be recyclable.
- Experienced insulation installers should be able to estimate quantities accurately, with small cut-offs being reused elsewhere on site in small gaps. Leftover insulation can also be taken offsite by the contractor for reuse in other jobs. Small amounts of damaged insulation may be generated and should be disposed of to landfill.
- The plastering contractor will generate an economically recyclable quantity of plasterboard waste from clean offcuts and damaged clean sheet, therefore a bin for recycling plasterboard offcuts should be provided on site. The bin should be clearly marked for clean plasterboard as it can be readily recycled (see 'Waste Contractors' section below).
- Lighting, cabinetry, and fittings will generate plastic and cardboard packaging waste. Separate cardboard and plastics bins or enclosures should be provided to capture this waste.

- Ceramic tile offcuts can be recycled with masonry waste. Carpet and carpet tile offcuts cannot readily be recycled. Vinyl flooring cannot currently readily be recycled.
- Flooring installed in units will result in small quantities of trimmed material. This should be sent to a mixed waste offsite processing centre where it can be disposed to landfill if not recoverable.

6. Finishes

Work includes painting and rendering, detailing of architectural façade features, floor sealing and finishes, cleaning.

- Where specified, render waste generated by rendering contractors may be cement based or mixed with synthetic binder. As for mortar, cement render waste can be removed and crushed for re-use in road base or similar. Synthetic bound render waste will need to be disposed of to landfill.
- Paint and floor sealing contractors will produce waste containers that are contaminated solvent-based waste, requiring tracking and disposal to an approved landfill facility. A bin for paint, adhesive and solvent containers will be used to store this waste and movements should be recorded in the waste register for contaminated materials.

7. Restoration

Re-establishment of kerbing, vehicle crossings and footpaths. Involves concrete pouring, and paving.

Contract conditions on trades and subcontractors

Trades on site that are likely to produce waste as a result of their activity, for example the plastering contractor, should be required to recycle waste that is recoverable, through contract conditions requiring the use of marked bins provided by the primary contractor for recoverable material, and including the waste management plan content as part of the contractor site induction conditions.



BKF1
FACE BRICK WORK TYPE 1, RED BRICK



BKF2
FACE BRICK WORK TYPE 1, CHARCOAL



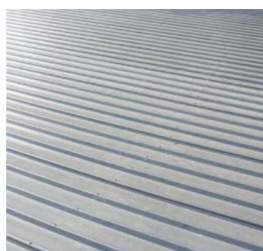
WAF
ALUMINIUM FRAMED WINDOW ASSEMBLY
POWDERCOAT FINISH IN COLOUR 1



COLOUR 1
COLORBOND MONUMENT



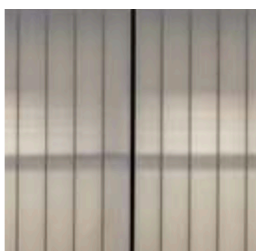
COLOUR 2
COLORBOND WINDSPRAY



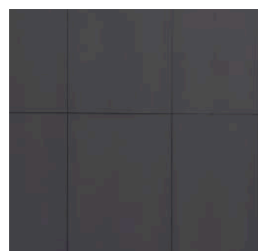
MTRF
METAL ROOF SHEETING, COLOURBOND
FINISH IN COLOUR 2



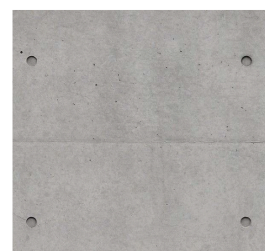
MTCL
METAL CLADDING STANDING SEAM PROFILE,
COLORBOND FINISH, COLOUR 2



PCRB
POLYCARBONATE WALL CLADDING



FC1
FIBRE CEMENT CLADDING PAINTED IN
COLOUR 1



CCOF
OFF-FORM CONCRETE, RAW FINISH

2.12.8 Table 2 Construction phase waste analysis – Structure, Services, Fit-out and Finishes

Materials On Site and Collection Bin			Destination		
			Reuse and Recycling		Disposal
Type of Material	Bin / Container	Estimated Qty – TBA by contractor	On-site (Re-use / onsite recycling)	Off-site (Offsite Recycling)	(Contractor and landfill site)
Concrete	Concrete / Masonry bin	16m ³ approx	The small volumes of waste concrete and blockwork expected may be reused onsite as ground stabilisation or binned for offsite recycling.	A concrete recycler can receive waste concrete and blockwork hauled off site. Separating masonry / concrete / bitumen attracts reduced charges from offsite recyclers compared with mixed materials.	Surf Beach Waste Management Facility
Waste masonry / blockwork Paver offcuts					
Metals - ferrous steel framing	Metals - ferrous	6m ³ approx		Recycled building products contractor or scrap metal merchant	Surf Beach Waste Management Facility Veolia, Benedict Industries
Metal – non ferrous. Roof sheeting, aluminium cladding, fencing, windows & door frames balustrading, copper pipes,	Metals – Non Ferrous	6m ³ approx	Much of the aluminium products will be prefabricated offsite which reduces waste.	Recycled building products contractor or scrap metal merchant. Non-ferrous metals are valuable.	Surf Beach Waste Management Facility Veolia, Benedict Industries
Plasterboard clean wall and ceiling lining trimmings / damaged sheet	PB	15m ³ approx	Large off cuts can be readily used on site	Plasterboard recycling service	Sydney Gyprock Recycling, ReGyp, Veolia

Materials On Site and Collection Bin			Destination		
			Reuse and Recycling		Disposal
Type of Material	Bin / Container	Estimated Qty – TBA by contractor	On-site (Re-use / onsite recycling)	Off-site (Offsite Recycling)	(Contractor and landfill site)
Electrical cabling/wiring offcuts	Mixed metals or separate wiring bin	6m ³ approx		A copper wire recycling facility such as will accept quantities from 2kg upwards, with better prices for large quantities of wire.	
Plastic and cardboard packaging	Plastic / cardboard recycling	38m ³ approx		To general recycling waste as handled by council's recycling trade waste service	Surf Beach Waste Management Facility Veolia, Benedict Industries
Paint / Solvent / Adhesive waste tins	Solvents	30L approx		Paintback	Disposal to paint and solvent tin facility
Finishes	Carpet, carpet squares, underlay, tiles,	8m ³ approx	Carpet can be laid underneath mulch as a weedmat.	Generally cut to size on the job, waste is minimal.	Surf Beach Waste Management Facility
Plastic (PVC drainage pipe offcuts, plastic wiring cable reels)	Plastic / Mixed recycling	5m ³ approx		Can be processed by a mixed waste recycling contractor,	Surf Beach Waste Management Facility

2.13 Recycling & Reuse of Materials

There are many ways that demolished building materials can be reused or recycled. Technology is developing constantly to increase and improve the options already available. Following are some of the ways that demolished building materials can be reused and recycled.

- **Concrete, blockwork, Bricks, Porcelain, Bitumen / Asphalt**
Concrete slabs/panels and bitumen/asphalt paving can be readily recovered and recycled for reuse or reconstitution in other construction products. Bricks can be crushed for reuse as aggregate and other products.
- **Plasterboard / Gypsum**
Clean plasterboard / paper lined gypsum board can be readily recovered and recycled for construction and agricultural use when crushed.
- **Metal**
Metal recycling generally falls into ferrous and non-ferrous metal categories
Numerous recyclers exist to handle both types in mixed and separated loads
- **Timber**
Many re-use opportunities as well as recycling and at the very least chipping for gardening.
- **Rigid PVC pipework and conduit**
Since PVC is a thermoplastic PVC pipe can simply be reground, pulverized and returned to the extrusion process to make new pipe. There are companies in NSW, Victoria, Queensland and Western Australia that take back and recycle construction industry PVC pipe or conduit. Conditions for take back are:
Accepts:
 - mixed building, construction and demolition waste of PVC and P.E. pipe
 - pipe with glue and dirtWon't accept:
 - pipe lengths under 1.5m
 - mud clumps on pipe– mud will clog up the granulating machines
 - connectors pieces – elbows or angles.
 - Screws, rivets or metal brackets connected
 - rubber seals
 - painted pipe
 - stickers
For details of companies that take back PVC see:
 - Vinyl Council of Australia <https://www.vinyl.org.au/find-a-recycler>
 - PIPA - Plastics Industry Pipe Association <https://pipa.com.au/recycling/>
- **Cardboard + Polystyrene**
As with cardboard, polystyrene is completely recyclable and can be used to produce a number of plastic products.
- **Globes – Fluorescent and High Bay**

Various elements of a light globe can be re-used which requires a more specialised process for separation. The mercury can be used for medical purposes, Lightweight Steel sheet in fixtures, copper cabling, castings can all be separated and recycled.

- **Finishes**

Carpet can be used as a weed mat.

- **Glass**

Some contractors will crush glass with concrete and/or bricks for road base. Due to poor prices for as well as an abundance of recycled glass, glass is generally currently not recycled separately. Window glass predominantly goes to landfill.

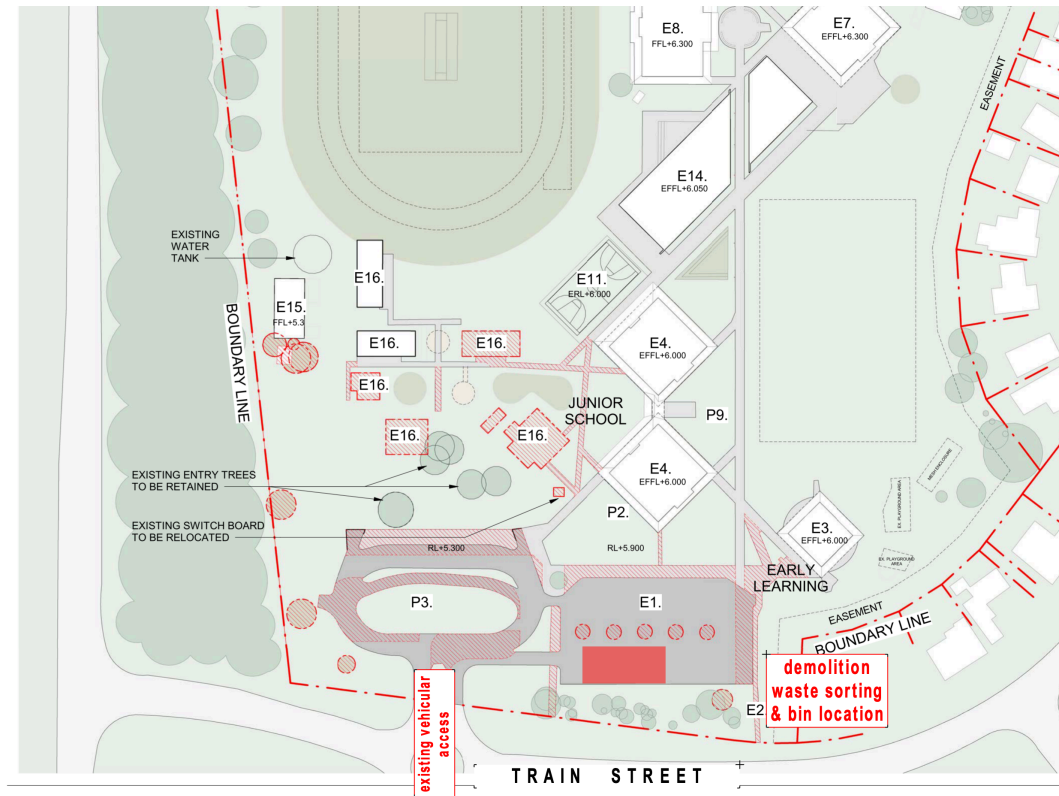
- **Green waste**

Green waste is very recyclable and easy to do so. Depending on the composition of the green waste – it can be used as Mulch or compost in many different formats. Depending on the waste it may even be sought after by the local zoo!

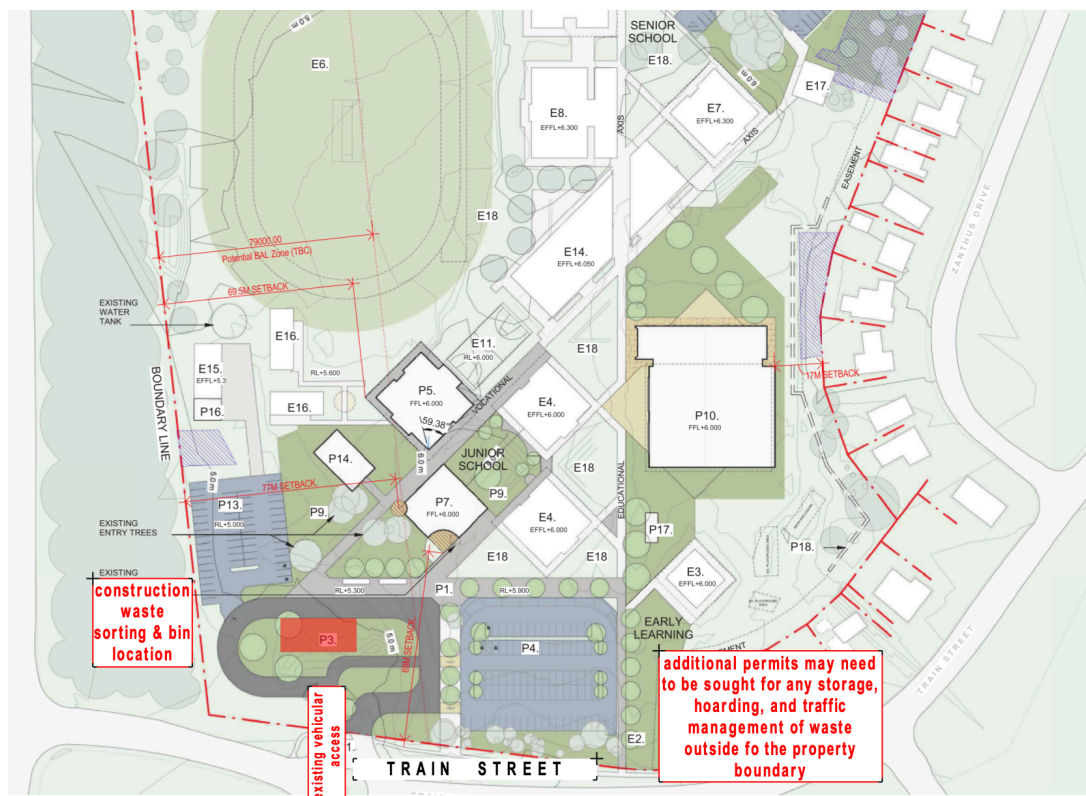
- **MDF**

Currently not known to be recyclable

Appendix 1 - Demolition & Construction Bin Locations



Demolition Bin Store Location.



Construction Bin Store Location.

Appendix 2 - Recycling, Reuse & Recovery Services Directory

Council operates 2 waste management facilities at Surf Beach & Brou as well as a third transfer station at Morya.

Surf Beach Waste Management Facility offers a number of demolition solid waste services that are streamed and recycled (for free) plus other construction / building waste (non-recyclable) for a fee including:

- Glass
- Timber
- Metal
- Concrete and demolition debris
- Aluminium waste recycling
- Polystyrene
- Cardboard / paper
- Fluorescent globes & tubes

They are located at 311 George Bass Drive NSW 2537 – PH 02 4471 2462

The Brou Waste Facility is located at 1 Brou Lake Road, Dalmeny NSW – Ph: 02 4476 8310

Suez Shoalhaven is located in South Nowra NSW and offers the following streamed recycling also:

- Glass
- Timber
- Concrete and demolition debris
- Metal, Aluminium & Steel waste recycling
- Timber & Wood
- Lighting
- Plastics

Suez is located at 1 investigator St, South Nowra NSW 2541 – PH: 13 1335 or 02 4474 8100

The following is an indicative only list of Sydney based contractors that provide various services for handling the recycling, reuse and disposal of demolition and 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 Western Sydney Recycling Directory – Construction and Demolition Waste 2017 is also a good resource: https://www.liverpool.nsw.gov.au/_data/assets/pdf_file/0019/114319/Western-Sydney-Recycling-Directory-CD-Updated-Nov-2017-1.pdf

- **Australian Native Landscapes** – Seven Hills, Terrey Hills, North Ryde, www.anlscape.com.au, ph. 131458
Green waste off-site composting.
- **Boral Recycling** – Wetherill Park
<https://www.boral.com.au/locations/boral-recycling-wetherill-park>
ph. 02 9604 9101. Concrete, asphalt, roof tiles, bricks and masonry blocks are accepted.
- **CMA Eco Cycle** <https://www.cmaecocycle.net> 1300 32 62 92
A full lighting recycling service – all lights and all volumes.
- **Ecocycle** – St Mary's www.ecocycle.com.au

Lighting, eWaste and Battery collection service.

- **Gyprock** – Wetherill Park www.gyprock.com.au/Pages/About-us/Recycling.aspx, ph. 131744 Only new, clean Gyprock product plasterboard waste is accepted. They do not provide bins.
- **IPlex Pipelines** - <http://www.iplex.com.au/>. Simon Laffan on 07 3881 9246 IPex requirements:
 - clean rigid PVC pipe and conduit is accepted.
 - Large volumes can be recycled
 - Arrange an inspection of pipe prior to sending to IPex – contact Simon
 - Below ground PVC must be clean for recycling
 - Pipes manufactured pre 2005-06 may contain lead. Excessive lead will cause problems with recycling.
 - PVC sheathing around electrical or data cabling not accepted.
- **KLF Holdings** – Camellia and Asquith <http://www.klfholdings.com.au/> –
- Porcelain, concrete and bricks
- **Lamp Recyclers** – Statewide <https://www.lamprecyclers.com.au> 1300 789 917
Lamp Recyclers is both a Collector and a Recycler of globes, lamps and fluorescent tubes. The method of disposal is dependant on the volume to be recycled. In this case, the volume is relatively small, so a Corflute Ezy-Return™ reply-paid lamp recycling pack should be requested and disposed of as per the instructions.
- **Onesteel Recycling** – Chipping North, Wetherill Park www.onesteel.com
Mixed metals recycling, full site clean-up and bin services.
- **ReGyp – Kurnell**
www.regyp.com.au, ph.1300 473 497
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
 - Detailed acceptable and non-acceptable waste information can be found at <http://www.regyp.com.au/waste/>
- **Suez** - <http://www.recyclingnearyou.com.au/large-dropoff/FairfieldNSW>
Soft plastics from packaging
- **Sydney rubbish services** Surrey Hills
<http://sydneyrubbishservices.com.au/plasterboard-gyprock-waste-removal/>
02 9785 5526
Bin only company - collects plasterboard for delivery to recycling centre
- **Veolia**
<http://www.veolia.com.au>, ph. 132 955
All waste metal in large volumes.

22/23 SURF BEACH Waste Management Facility Fees



* TRAILER SIZE BASED ON 6 X 4 LOAD	ALL LOADS UP TO 300kg					Loads by weight Over 300kg or more than a large load Minimum charge applies
	MIN load <small>Up to half 240L wheelie bin</small> 	SML load 	UP to MED load 	MED load 	LGE load 	
Product						
Waste material Mixed waste, household waste, builders waste, masonry, timbers not accepted for resale including sawdust, other general solid waste	\$6 per load	\$16 per load	\$23 per load	\$33 per load	\$49 per load	\$167 per tonne \$50 min charge
Recoverable material Vegetation up to 200mm, Buyback- items accepted for resale including reusable building material and clean bricks	\$5 per load	\$7 per load	\$11 per load	\$16.50 per load	\$24 per load	\$50 per tonne \$25 min charge
Commercial recycling Paper/cardboard, Co-mingled recycling	no charge	no charge	no charge	\$18 per load	\$26 per load	\$104 per tonne (loaded into bins)
Waste material from construction, demolition, commercial and industrial sectors, including asbestos, clean or mixed concrete, bricks and stumps/logs > 200mm/, palm/tree fronds					\$182 per tonne \$55 min charge	
Waste material – Immediate burial Offensive waste, asbestos (not booked), large dead animals, VENM ie soils, BioSolids					\$260 per tonne \$77 min charge	

Recycling Prices per single item

Tyres car **\$7** on rim **\$14**
 4x4 & light truck **\$9** on rim **\$16**
 truck/tractor (over 41cm)
 market rate **plus \$2**
 Solar Panels **\$10**
 Mattress and/or bases – all sizes **\$36**
 Dead animals (small) **\$9**
 Vehicle weighing **\$23**
 Shredded mulch: please ask weighbridge operator for price/availability

Recycling accepted for **FREE**. Must be clean and separated.

Polystyrene, steel, metal,
cars, motors, caravans,
trailers, fridges, white goods,
hot water systems, empty
'drumMuster' chemical
drums, vehicle batteries.

Domestic recycling

Yellow lidded bin recycling,
motor oil & motor oil
containers, cooking oil.

E-waste items

TV's, computers,
computer products,
printers, scanners,
keyboards, DVD players,
set top boxes and
stereos. Mobile phones,
fluorescent light
globes and tubes and
household batteries.

The acceptance of recycling, recoverable, operational and waste material is at the discretion of the weighbridge operator

Open Mon – Fri 7am–4.45pm | Sat, Sunday & Public Holidays 8am–3.45pm
Closed Christmas Day, New Years Day, Good Friday and Easter Sunday