GreenSmart®
build green build smart

WASTE MINIMISATION v1.1

This guide provides practical and cost-effective ways to minimise construction waste for residential projects.

WHY MINIMISE CONSTRUCTION WASTE?

Cost and Resource Efficiency - A residential construction project typically spends $500-$1000 for waste disposal services. However, the *true cost* of construction waste includes added material costs, additional onsite storage and handling, transport & landfill costs.

Liability – Building sites contribute a large volume of waste, some potentially hazardous, so manage waste responsibly to minimise risk and potential liability.

Conservation – A significant amount of building waste is reusable or recyclable. By looking at building waste as potential resources you can play an important part in conserving natural resources and landfill space.

DID YOU KNOW…

Construction & demolition waste represents up to 50% of all waste generated in NZ[1].

1. Data source: http://www.mfe.govt.nz/issues/waste/construction-demo/index.html

CONSTRUCTION WASTE – KNOW WHAT YOU THROW

Use the table below as a guide to waste composition, but remember each job is unique and only you can tell whether materials are being used efficiently to minimise waste.

Residential Construction Waste
Example: 200sqm New Residential Construction

Waste Type	Approx Weight (kg)	%	Approx Volume (m^3)	%
Plasterboard	1040	32	5.3	20
Wood based products (approx 25% untreated)	780	24	4.9	18
Concrete & Masonry	490	15	0.8	3
Packaging	165	5	4.9	18
Metals	100	3	1.0	4
Insulation	25	1	2.0	7
Hazardous	20	1	0.1	-
Other	620	19	8.0	30
Total	3240	100	27.0	100

Data source:

ITM Building Guide: How to Minimise Construction Waste (Waste audit results from Beacon Pathways NOW Homes 2005 and 2006, US NAHB Residential Construction Waste Management – A Builders Field Guide 1997 and Target Sustainability Program, Christchurch, 2008).

Waste Disposal Costs

Waste Type	Skip Volume (m^3)	Approx. Weight Limits (kg)	Approx Cost
General Waste	3	450	$170-$210
General Waste	6	1000	$210-$240
General waste	9	1500	$240-$290
Hardfill/Cleanfill	3	3000	$180-$240
Landfill charges approximately $60-$100 per tonne (1000kg)			

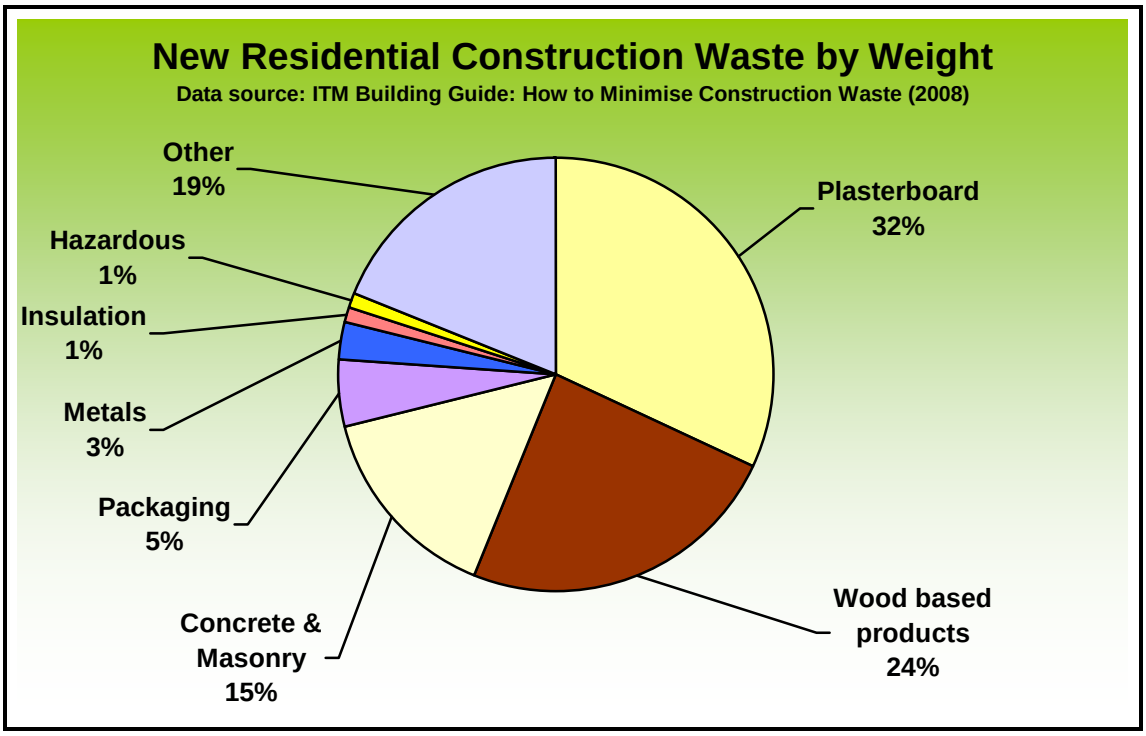
Table notes (2):

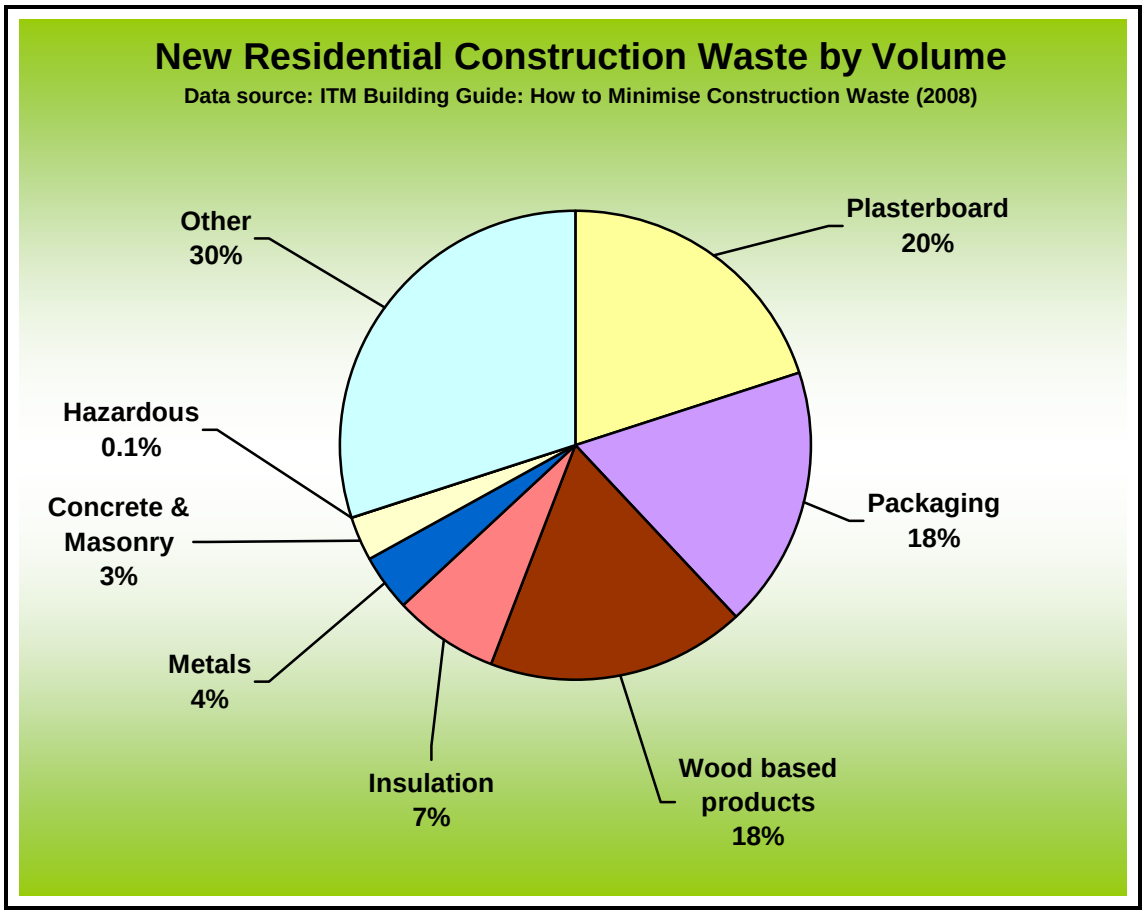
1. Pricing and weight limits based on Akl/Wgn/ChCh regions. As at October 2009.
2. Hardfill/Cleanfill material includes concrete, asphalt, masonry blocks, bricks and natural materials such as clay, soil and rock. General waste excludes hardfill/cleanfill & hazardous wastes.

DID YOU KNOW…

The average residential construction project generates 25-30m^3 or 3000-3500kg of waste materials.

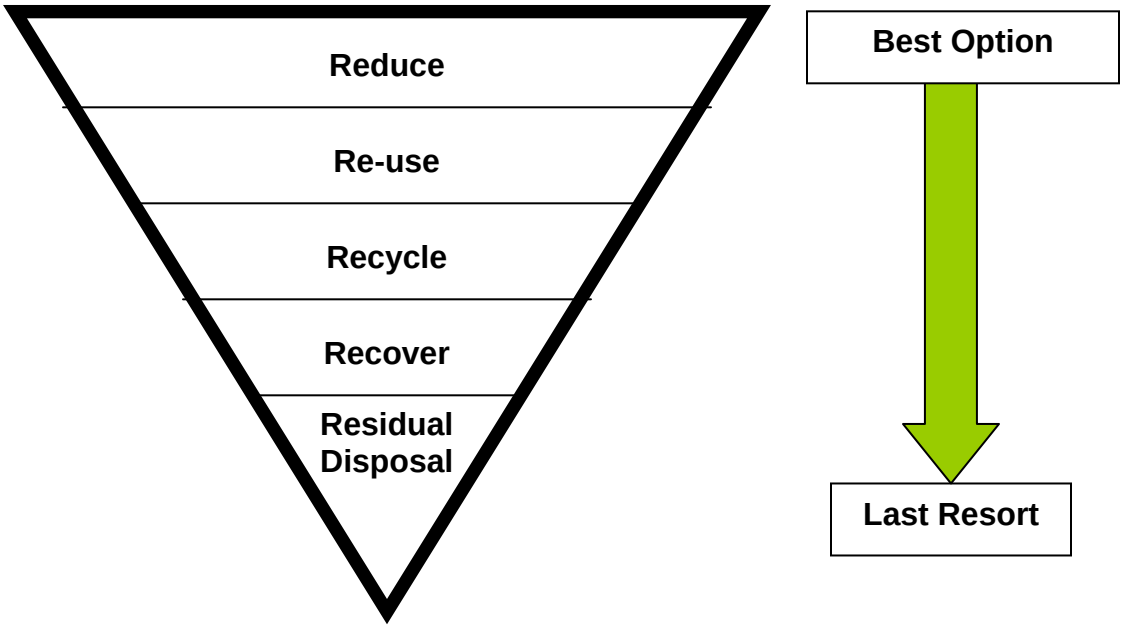
Data source: ITM Building Guide: How to Minimise Construction Waste (Waste audit results from Beacon Pathways NOW Homes 2005 and 2006, US NAHB Residential Construction Waste Management – A Builders Field Guide 1997 and Target Sustainability Program, Christchurch, 2008).





THE 5R APPROACH TO MINIMISE WASTE

Use the 5R waste hierarchy to prioritise waste minimisation efforts. In order of priority, waste reduction (or prevention) is always the best option, followed by re-use then recycling & recovery and as a last resort residual disposal to a cleanfill or landfill site.



'*Recycling*' diverts waste materials from disposal to produce products with potential economic or ecological benefits.
'*Recovery*' is a wider term that includes the re-use of waste products as a fuel source.
'Re-use' means to make use of again without further processing i.e. to use in its original state.

Reduce.

- ☐ *Plan ahead* – Develop a site waste management plan that outlines your waste targets, actions and preferred waste & recycling operators (a site waste management plan template can be downloaded at www.greensmart.org.nz or the BRANZ Rebri website www.rebri.org.nz or www.branz.co.nz)

- ☐ *Inform and reward your team* - Distribute this guide to your construction team. Make waste information and progress towards waste reduction targets readily available and part of your site waste management plan. Have incentives for your team if your waste reduction targets are met such as morning tea shouts.

- ☐ *Design out waste* - Encourage designers and customers to use standard product dimensions (e.g. 600 or 1200mm increments, standard door and window sizes) and pre-fabricated products wherever possible to reduce onsite handling, reworking and offcuts.

- ☐ *Material estimates* – Provide detailed plans and instructions so suppliers and contractors can provide accurate material takeoffs. If you notice an excess of waste materials for a particular product then reduce the wastage allowance for material estimates.

- ☐ *Incentivise subcontractors* - Add contractual terms to incentivise subcontractors to minimise waste such as; making them responsible for the supply of materials and responsible management of any waste, penalties for unauthorised dumping or giving preferential consideration to contractors who follow your site waste management plan.

- ☐ *Prevent unauthorised public dumping* – This can represent a large amount of waste removed from building sites. Avoid having skips on site until absolutely necessary and keep them away from public view and access if possible. Request lockable bins if practical. Use a recycling site sign which prominently displays a recycling symbol and states 'This Builder Recycles. NO UNAUTHORISED DUMPING'.

Re-use.

- ☐ *Return for credit* - Ask your supplier whether pallets and unused products in good condition can be returned for credit.

- ☐ *Builders re-use* – Re-use larger lengths of timber, large pieces of flooring, cladding, building wrap, polythene, slightly damaged finished products such as mouldings, cabinets and doors and leftover paints.

- ☐ *Re-use by homeowners and others* - Valuable and useful excess materials such as leftover paint, floor coverings, fixtures and fittings can be neatly stored for the homeowner's future use. Alternatively, sell excess re-usable product on Trademe or the Waste Exchange (www.wasteminz.org.nz/wasteexchange/index.htm), give away to others or offer 'FREE' kerbside collection or donate them to non-profit organisation's, such as Habitat ReStores as a tax-deductible charitable donation.

Recycle. *Most residential construction waste is recyclable including untreated timber, plasterboard, cardboard, metal, polystyrene and some plastics, some carpets and paint so check your options with your waste company, recycling facilities, suppliers and contractors*.

Did you know…
Some skip companies will take your mixed waste skip from your building site and sort out the recyclable materials offsite at Material Recovery Facilities (MRF's). This can save you considerable time, cost and space on site sorting recyclables. Mixed waste recyclables can include untreated timber, plasterboard, metals, cardboard & plastic packaging (check with your skip bin company).

- ☐ *Ask your skip company:*
  - o Whether they can sort and recycle your *mixed waste* skip offsite? – if not, it may be time to review your skip company.
  - o Whether they undertake initial waste audits on your skips to help you identify your waste composition?
  - o What specific materials they recycle?
  - o How much of your overall skip waste do they recycle?

- ☐ *Onsite sorting and re-use of materials* - High sided skips encourage "out-of-sight, out-of-mind" wasteful practices. An alternative is to fence off a waste storage area with rolled wire or plastic mesh to encourage sorting and re-use of materials and to avoid a skip on site until absolutely necessary. Suggested re-use and/or recycling piles in the order they normally occur are: steel, concrete & masonry, timber products, plastics/ building wrap, insulation, plasterboard, paint tins and cardboard. Sorting onsite will produce a significantly higher rate of recycling than offsite sorting of commingled waste skips.

- ☐ *Lunch waste* - Provide a dedicated rubbish bin or bag for workers lunch wrappers, food scraps etc to avoid skip contamination and a recycling bin for bottles, cans, newspapers, magazines etc.

WASTE MINIMISATION BY PRODUCT

Plasterboard - *About 30 percent of residential construction waste by weight*

- ☐ *Offsite recycling* - Plasterboard is essentially gypsum and paper and after it is ground it is commonly applied as a soil conditioner. Gypsum, the main ingredient improves soil condition (reduces compaction and improves water drainage, retention and conservation) while supplying essential nutrients (calcium and sulphur). Gypsum is a natural, non-toxic mineral and is not harmful to children or pets and even when applied at very high levels it will not damage soil or plants. Plasterboard is best recycled when dry so try to cover or store in a sheltered place such as the garage until collection.

- ☐ *Onsite recycling* - For onsite disposal use clean unpainted standard plasterboard only (excluding wet area board and bracing board which may contain wax or fibreglass additives). Pulverize to pieces smaller than 2cm diameter and place below topsoil to accelerate the breakdown of the product. Spread evenly and apply at a rate of up to 5kg per square metre (standard sheet is approx 20kg). Avoid wet areas as prolonged anaerobic conditions can cause sulfide gas formation. **Check compliance with your local territorial authority beforehand.** Information courtesy of www.gypsum.org.

Wood based products - *About 25 percent of residential construction waste by weight.*

- ☐ *Reduce* - Reduce timber offcuts by using efficient pre-fabricated wall framing and roof trusses. They are often numbered and packed sequentially to minimise handling and possible damage.

- ☐ *Re-use* - Formwork, timber scaffolding, bracing, pegs and larger lengths of timber etc can be re-used on your next project. Untreated timber offcuts can be donated to local school woodworking classes or left at the kerbside for free firewood. Pallets should be returned to your suppliers (a credit may apply).

- ☐ *Recycling untreated timber (approx. 25% of timber waste)* - Specify untreated timber in all applications where this is allowed to encourage future recycling. Because timber waste is usually a mixture of treated and untreated timber it is often difficult to sort and recycle small quantities.

  If untreated timber can be successfully sorted by you or your skip company, recyclers will often chip for use as mulch, compost, landscaping, animal bedding, landfill cover, potential re-use in building products or as a fuel source for industrial burners and domestic wood pellets.

- ☐ *Recycling treated or engineered timber (approx. 75% of timber waste)* - There are limited markets for recycling treated or engineered timber (ply, particleboard, strandboard, MDF, laminated beams etc). The best option is to reduce and re-use as much as possible until viable recycling and recovery markets develop. Never burn treated timber or sawdust, unless proven to be safe (check material safety data sheets from timber supplier).

Packaging (Cardboard, paper, plastic & polystyrene) – *About 18% of residential construction waste by volume.*

- ☐ *Reduce* - Ask your suppliers to limit packaging. Specify no frame & truss wrapping to avoid unnecessary packaging waste (**But only if weatherproofing is not required on site**). Some appliance suppliers will help unpack products and take away plastic, polystyrene and cardboard packaging.

- ☐ *Recycle* - If domestic recycling operates in the area, leave out stacked cardboard on the kerbside ready for collection or drop off at local recycling depots.

Metals - *Steel, copper, aluminium and most other metals are valuable and readily recycled*.

- ☐ *Recycle* - If metal quantities are sufficient you should sort on site and sell them to a local steel recycler. Otherwise, many skip companies will collect your mixed waste skip and sort any metal offsite for recycling.

Insulation - *About 7% of residential construction waste by volume.*

- ☐ *Reduce* - Excess insulation should be carefully placed in the ceiling space, especially at perimeters or any vacant wall cavities or gaps. Larger polystyrene sheets can be used under concrete floors and driveways or as a protective lining behind retaining walls or underground walls.

Concrete & Masonry - *About 15% of total weight and if unchecked can quickly exceed skip weight limits. A cubic metre of solid concrete equals 2400kg!*

- ☐ *Re-use* - Most concrete, masonry and brick waste is inert fill and can be used on site for landscaping, backfill, under walkways or driveways. Because of its weight re-using on site can be far more effective than additional handling, excess weight and disposal costs.

- ☐ *Recycle* - If quantities allow, your skip company can supply a specific hardfill skip. Recyclers will separate and crush any concrete & masonry waste offsite for re-use as aggregates and also separate and recycle any steel reinforcing bar and mesh.

Hazardous materials – *Minimal weight and volume but potentially very damaging so dispose of them responsibly to protect the public's health, the environment, and yourself from any liability.*

- ☐ *Re-use* — leftover paints, stains, solvents, adhesives, sealants etc should be re-used where possible.

- ☐ *Recycle* - Paint and stain can usually be recycled so contact your supplier or contractor for options or try Resene's paintwise recycling program. Visit www.resene.co.nz/paintwise.htm for a local collection point.

- ☐ *Correct disposal* – Toxic runoff and hazardous substances must never enter waterways or stormwater drains.

  Hazardous substances such as adhesives, sealers, paints, paint stripper, stains, timber treatments, and solvents must be contained carefully and disposed of correctly. Specify low volatile organic compound (low VOC) products where possible.

  For hazardous waste disposal options contact your territorial authority, supplier or contractor, skip company, local landfill or Material Recovery Facility. Add them to your site waste management plan.

DISCLAIMER

This document contains a range of information, data, advice and recommendations which are intended as a guide only. Whilst the information in this document has been prepared with due care we do not warrant or assume any legal liability or responsibility for the accuracy, currency, completeness, or usefulness of any information, product or process disclosed.

This document is not a substitute for independent professional advice and users should obtain any appropriate professional advice relevant to their circumstances.

Please note
Circumstances will vary according to your location in New Zealand. You should contact your waste disposal company, suppliers, product manufacturers and local territorial authority for further advice.

GreenSmart®
build green build smart

References

BRANZ – level book series and website www.level.org.nz
BRANZ REBRI website – www.rebri.org.nz or www.branz.co.nz
Beacon Pathway – www.beaconpathway.org.nz
ITM Building Guide: How to Minimise Construction Waste – www.itm.co.nz/sustainability
Now Home – www.nowhome.co.nz
Target Sustainability Program (Christchurch) – www.targetsustainability.co.nz
US NAHB Residential Construction Waste Management – A Builders Field Guide 1997