

HERE'S WHY – FIVE GOOD REASONS TO MINIMISE CONSTRUCTION WASTE

- 1. Cost** - A residential construction project typically spends \$500-\$1000 for waste disposal services. However, the *true* cost of construction waste includes material cost, additional onsite storage and handling (allow 2.5 hours extra per tonne of waste), transport & landfill costs, lost salvage value and the environmental effects.
- 2. Efficiency** - Knowing what materials end up in your skip can tell you a lot about the accuracy of your material estimates and how efficiently your designers, workers and subcontractors are using materials. *Every \$100 saved is bottom line profit – that equals a \$1000 of sales at a 10% profit margin!*
- 3. Liability** - As a large generator of waste, some potentially hazardous, it is important that you manage your waste responsibly to minimise risk and potential liability.
- 4. Conservation** - A significant amount of building waste is recyclable. By looking at your waste as potential resources you can play an important part in conserving natural resources and landfill space.
- 5. Marketing** - Let the buying public know you are minimising waste to protect our environment. Provide them with a flyer explaining your company's waste management plan and the total landfill space per year your company saves. Display a prominent sign on your site or skip bin displaying your company logo, a recycling symbol and stating 'This Builder Recycles'.

DID YOU KNOW...

- > Construction & demolition waste represents up to 50% of all waste generated in NZ.¹
- > Plasterboard, wood based products, concrete & masonry, and packaging comprise about 75% of residential building waste by weight.²

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

2. Data source: Refer table notes (1).

ITM BUILDING GUIDE: HOW TO MINIMISE CONSTRUCTION WASTE



INNOVATIVE NEW IDEAS

ON-SITE GRINDING - It is possible to grind up plasterboard and untreated timber waste and apply it to the site before covering with topsoil - you'll need to check with the local territorial authority to determine the acceptability of this method. If all untreated timber waste and plasterboard could be handled this way, storage, transport, and landfill costs would be eliminated for approximately 40% of your building waste.

COMMINGLED RECYCLING BINS - Some waste bin companies have front loading and lockable bins for commingled recyclable packaging waste including plastics & polystyrene (including polythene film and synthetic builders wrap), cardboard & paper. Bin sizes vary from 660L to 3m³. For commercial sites only.

ADDITIONAL RESOURCES

Additional waste minimisation resources, including a waste management plan template, can be found on the ITM website www.itm.co.nz/sustainability or for more comprehensive information visit the REBRI website: www.rebri.org.nz

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.

Produced in association with BRANZ, WasteMINZ and Recyclers of New Zealand (RONZ)



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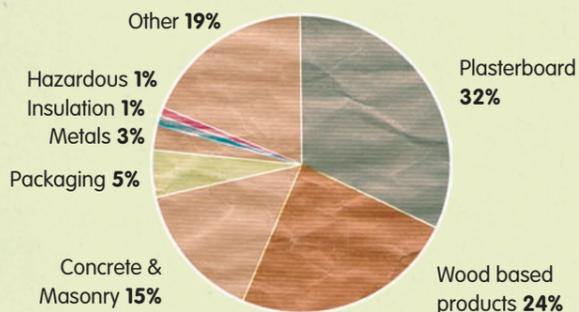
INTRODUCTION

This field guide provides builders, designers, estimators, project managers, and subcontractors with simple, cost-effective and practical ways to minimise construction waste. The guide will help you and your construction team to answer the following questions:

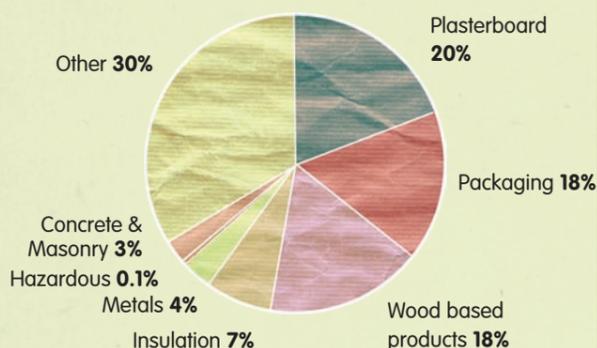
- > Why minimise construction waste?
- > What materials and material quantities are typically in construction waste?
- > How can we minimise construction waste in simple, cost effective and practical ways?

The information contained in this guide is relevant to most construction projects but particularly for new residential construction.

NEW RESIDENTIAL CONSTRUCTION WASTE BY WEIGHT



NEW RESIDENTIAL CONSTRUCTION WASTE BY VOLUME



Data source: refer table notes (1)

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.



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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 |

WASTE DISPOSAL COSTS

| Waste Type | Skip Volume (m ³) | Approx Weight Limits (kg) | Approx Cost |
|--|-------------------------------|---------------------------|-------------|
| General waste | 2 | 300 | \$110-\$170 |
| General waste | 3 | 450 | \$150-\$200 |
| General waste | 4.5 | 675 | \$160-\$220 |
| General waste | 6 | 1000 | \$210-\$270 |
| General waste | 7.5 | 1250 | \$220-\$300 |
| General waste – Common size for construction waste | 9 | 1500 | \$260-\$280 |
| Hardfill/Cleanfill | 2 | 2000 | \$140-\$180 |
| Hardfill/Cleanfill | 3 | 3000 | \$180-\$240 |

Landfill charges approximately \$50-\$100 per tonne (1000kg).

TABLE NOTES (1):

- Volume data based on skip volumes, including uncompacted air space.
- Data source: Waste audit results from Beacon Pathways NOW Homes 2005 and 2006, US NAHB Residential Construction Waste Management – A Builders Field Guide 1997 and builders feedback and waste audits from the Target Sustainability Program, Christchurch, 2008.

TABLE NOTES (2):

- Pricing and weight limits based on Akl/Wgn/ChCh and vary considerably from region to region. Discounted rates may apply for sorted recyclable and cleanfill materials. As at July 2008.
- Additional charges apply for exceeding weight limits and pickup dates.
- 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.

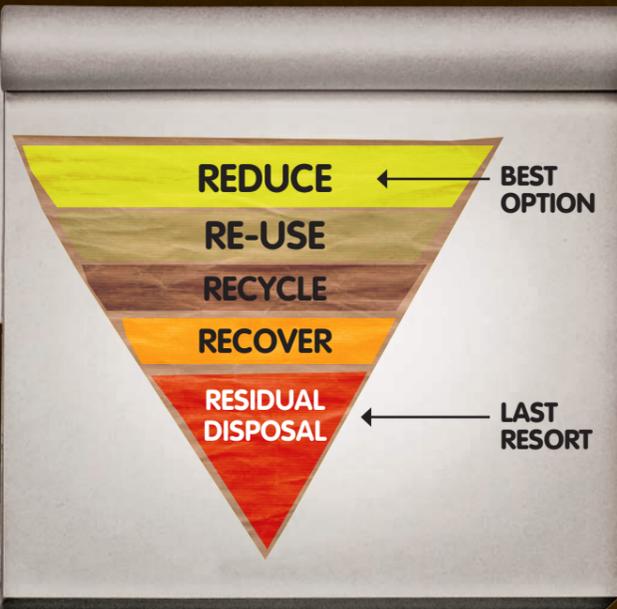
DID YOU KNOW...

- The average residential construction project generates:
- > 25-30m³ or 3000-3500kg or 2-3 standard 9m³ skips of waste.
 - > 16kg or 0.14m³ of waste per square metre of floor area.

Data source: refer table notes (1)

HERE'S HOW – THE 5R APPROACH TO MINIMISE WASTE

Use the 5R waste hierarchy to prioritise your waste minimisation options. 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.



DID YOU KNOW...

'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 any processing i.e. to use in its original state.



"We'll see you right"®

REDUCE

Assign a waste management champion – Assign a senior staff member with an interest in waste minimisation to take responsibility for the project waste management plan (a waste management plan template can be found on the ITM website www.itm.co.nz/sustainability)

Set realistic waste reduction targets – Let your team come up with some ideas and set 'easy to understand' waste targets such as a reduced number of skips used or cubic metres of waste per project or square metres of floor area.

Reward your team – Have incentives for your team if your waste reduction targets are met such as morning tea shouts.

Inform your team – Distribute this guide to your construction team. Make waste information and progress towards waste reduction targets readily available and part of your waste management plan.

Design considerations – Encourage designers and customers to use standard product dimensions (e.g. 600 or 1200mm increments, standard door and window sizes) and prefabricated products wherever possible to reduce onsite handling, reworking and offcuts.

Material estimates – Provide detailed plans and instructions so

estimators, workers 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 any unauthorised dumping or giving preferential consideration to contractors who follow your waste management plan.

Prevent unauthorised public dumping – This can represent up to 30% of waste removed from building sites. Avoid skips on site until absolutely necessary and keep them away from public view. Ask your skip company for lockable bins. Use a recycling site sign, banner, tarp or skip bin 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 – Several waste materials can be readily re-used: 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. Individually these materials don't fill skips but collectively they can send your total waste from one or two skips per job to two or three.

Re-use by homeowners and others – Valuable or useful excess

materials such as leftover paint, floor coverings, fixtures and fittings can be neatly stored for the homeowner's future use. Alternatively, try selling excess re-usable product on Trademe or the Waste Exchange (www.wasteminz.org.nz/wasteexchange/index.htm), giving it away to others, offering 'FREE' kerbside collection or donating them to non-profit organisations, 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.

Questions to ask your skip company:

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

Preferred waste operators – Keep a list of preferred skip companies, and waste recycling depots on hand for your team to use and make them part of your waste management plan.

Onsite sorting and re-use of materials – High sided skips can 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.

Disposal tip – Compacting, consolidating, sorting and flat stacking your plasterboard, timber, metals, insulation, cardboard and plastic packaging waste can save considerable volume in your waste skips.

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 provider).

HERE'S HOW – WASTE MINIMISATION BY PRODUCT

PLASTERBOARD

About 30 percent of residential construction waste, five kilograms per m² of floor area or five m³ per tonne.

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 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 possible sulfide gas formation. **Check compliance with your local territorial authority beforehand.** Information courtesy of www.gypsum.org.

Waste deferral – It can be cost effective to store clean offcuts within internal wall spaces, providing the opportunity to recycle them at the end of the homes' useful life. Offcuts should be cut down or scored and folded 'concertina' style up to four sheets max to allow for future wiring. Care must be taken to select wall cavities without insulation, wiring, plumbing or HVAC ducts such as wardrobes, hot water cupboards, stairwells or garages. Place pieces securely to avoid rattling and consider the sequence of lining rooms to ensure vacant walls are available as each room is completed.

WOOD BASED PRODUCTS

About 25 percent of residential construction waste or four kilograms per m² of floor area or six m³ per tonne.

Reduce – Reduce timber offcuts by using efficient pre-fabricated wall framing and roof trusses. They are often numbered and packed sequentially to minimise resulting damage from unnecessary onsite handling.

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 very limited markets for recycling treated or engineered timber (ply, particleboard, strandboard, MDF, laminated beams etc). Your best options are to reduce and re-use as much as possible and to keep in contact with your local skip companies and recyclers as further research on recycling and recovery markets develop. Never burn treated timber or sawdust, unless proven to be safe (check material safety data sheets from timber suppliers).

PACKAGING

(Cardboard, paper, plastic & polystyrene) – About 18% of total waste volume is packaging and if unconsolidated, can send your job-site skip to the landfill long before necessary.

Reduce – Ask your suppliers to limit packaging. Specify no frame & truss wrapping to avoid unnecessary packaging waste (**but only if weatherproofing is not required**). Some appliance suppliers will help unpack products and take away plastic, polystyrene and cardboard packaging. By consolidating waste your supplier can collect more economical volumes for recycling purposes.

Recycle – If domestic recycling operates in the area, you can put out stacked cardboard on the kerbside ready for collection or drop off at local recycling depots. Most packaging is readily recycled if easily sorted so ask your skip company or MRF whether they can sort offsite and recycle packaging contained in your mixed waste skips.

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 total waste 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 & 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. To minimise hazardous wastes use low volatile organic compound (low VOC) paints such as Wattyl EcoProof® and zero VOC, solvent and odour free adhesives and sealants from the Bostik SAFE range.

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