

EASY GUIDE TO

reducing construction wastes

This pocket guide was produced by the Building Research Association of New Zealand (BRANZ), an independent, industry-owned organisation. It is the product of many years of research, field testing and consultation with construction industry and related experts.

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Comments are welcome.

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NOTES

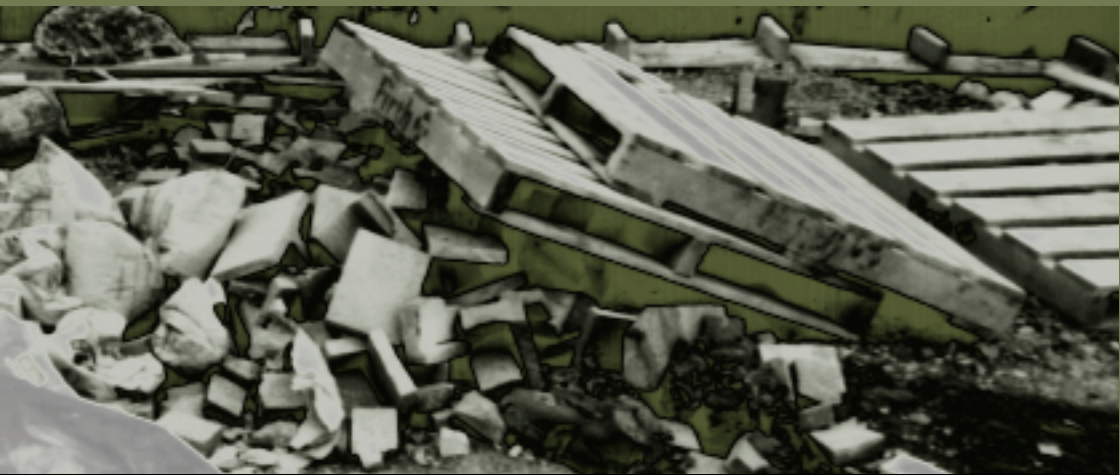
Are you a
designer, quantity surveyor, site manager, or contractor?

Do you want to
reduce material + liquid wastes from construction sites?

But need
practical guidance + recycling contacts?

Then read on...

More copies of this booklet can be downloaded
from www.rebri.org.nz



EASY GUIDE TO

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A PRACTICAL GUIDE TO REDUCING WASTES FROM BUILDING SITES



SPECIALISED CONTACTS

Listed below are some organisations that have a special interest in construction waste reduction.

Your One-Stop-Shop Internet Tool

Gives practical New Zealand-specific advice for construction site waste reduction with lots of tips and useful contacts: www.rebri.org.nz

BRANZ Ltd

BRANZ Ltd has been involved in various construction-material reduction activities, including research, projects with Territorial and Local Authorities and publications. Ph 04 237 1170 or email RomanJaques@branz.co.nz

Auckland Regional Council (ARC)

ARC has been involved in construction industry recycling, with demonstration trials, advocacy and supporting information – including the REBRI program which is a free material waste advisory service for industry. Contact ARC, Auckland. Ph 09 366 2070

Recycling Operators of NZ (RONZ)

RONZ is a non-profit networking organisation representing recycling operators and organisations. RONZ lobbies and promotes recycling, materials recovery and waste minimisation. Contact Karuna Douglas, Auckland. Ph: 09 488 9449 or email: ronz@pl.net

Waste exchange programmes

These operations help business find new ways to use their waste materials. They can be accessed through the internet on:

Auckland: www.arc.govt.nz

Waikato/BOP: www.nothrow.co.nz

Wellington: www.enviromart.wcc.govt.nz

Christchurch: www.ccc.govt.nz/TargetZero/WasteMinimisation

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WHO IS THIS GUIDE FOR?

This pocket guide is for everyone who works in the building construction industry, but especially: site managers, contractors, designers, quantity surveyors and sub-contractors.

It offers you:

- an overview of important issues that should be considered
- practical guidance on how to address essential issues
- ways to reduce solid material wastes during design and construction
- ways to reduce liquid effluent for construction sites
- recycling outlet contact details.

The information in this guide is relevant for most construction types and sizes.

REMEMBER Material wastes are a valuable asset!

For the Auckland Region, call the Auckland Regional Council's Resource Efficiency Advisor on 09 366 2070, or email jocelyn.rennie@arc.govt.nz

For the Wellington Region, call the Wellington City Council's Enviromart on 0800 439 242 or visit www.enviromart.wcc.govt.nz

For the Christchurch Region, call Christchurch Regional Council's Target Zero on 03 3711 487 or visit www.ccc.govt.nz/TargetZero/WasteMinimisation

YOUR CONTACTS

Operator's name	Specialist area	Contact

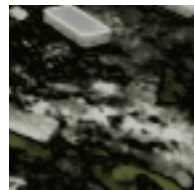
RECYCLED/RECOVERED MATERIAL OUTLETS

The main materials with current markets are:

- metals (ferrous and non-ferrous); sold for recycling.
E.g. rebar, roofing, sandwich panel, drink cans, piping, wire, cladding, drums etc
- concrete sold for crushing. E.g. ex slabs, pipes, excess material etc
- untreated timber collected for recycling and reuse.
E.g. joinery, fittings, framing, boxing, offcuts, pellets, framework etc
- Paper and cardboard collected for recycling. E.g. from packaging and infills (not building paper).

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Below are organisations who keep a current listing of recycling operators and recovered material outlets in your region. Please call them, to get information on who is best to use. There is room to note your preferred operator in the Table that follows.



WHY USE THIS GUIDE?

Six great reasons why you should be looking at reducing construction wastes:

1. to save costs
2. to reduce unnecessary use of materials
3. to enhance your competitive advantage
4. to improve work habits
5. to help the environment and reduce landfill loads
6. to future-proof your business against new legislation.

This guide focuses mainly on reducing material and liquid wastes during the construction process. However, if waste aspects are considered earlier during concept design, then there are more opportunities for the contractor / client / project manager to consider.



WASTE PRINCIPLES

The principles of reducing material waste are summed up by the 5R waste hierarchy:



What many people don't realise is the cost associated with waste disposal – that is, the **true** cost of material wastes:

True cost = purchase price + transportation costs +
handling + storage costs + disposal costs +
loss of salvage revenue.

PLANNING AHEAD

- draw up a drainage plan for your site
- ensure that any stored materials are safe and secure
- have a 'Spill Kit' – the manual for fixing and effectively dealing with spills on site
- write a 'spill procedure plan' to deal with accidents
- have regular inspections and maintenance.

Discharging pollutants into stormwater drains is illegal, unless you have resource consent or it is a permitted activity! If you are unsure, check your local authority first.



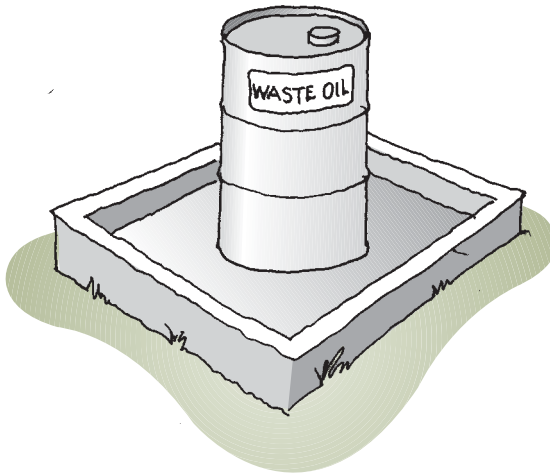
This is to be avoided!



DEALING WITH LIQUID POLLUTION

Ways of dealing with possible liquid pollution

- have a dedicated wash-down area
- use bunds or drip trays to prevent leak and spill contamination
- use gravel areas, silt fences, swales, or ponds for silt containment
- install oil and grease interceptors
- make sure paint left overs are dry before disposing with solid wastes.



ROLES, ROLES, ROLES



Everyone in an effective waste management programme has an important role to play.

Designers and quantity surveyors can:

- ensure drawings and supporting information are as accurate as possible
- use prefabrication where possible, as it generates less material waste
- base room sizes on standard sheet sizes.

Site (waste) manager can:

- champion, educate, and oversee the programme
- focus on recyclable materials that are generated in bulk and can be re-used/resold
- ensure recycling bins are clearly labelled on all sides, and are kept in the same location as waste bins
- give encouragement to staff for a job well done.

(Sub) contractors can:

- be made aware of site waste policy
- take care to separate wastes
- re-use materials where possible
- have a sense of ownership of the waste management
- have a dedicated cutting site where possible.

ROLES, ROLES, ROLES (CONT)

Suppliers should be encouraged to:

- co-ordinate 'just in time' deliveries
- re-use pallets and packaging
- offer products with recycled content
- use less packaging.

GENERAL CONTACTS

For general advice and information, try:

- Zero Waste NZ Trust ph 09 486 0734 or visit www.zerowaste.co.nz
- BusinessCare Trust ph 04 801 9162 or visit www.businesscare.org.nz
- Auckland Environmental Business Network (AEBN) ph 09 817 2622 or visit www.aebn.pl.net

For outlet/recycler listings, for the three main New Zealand cities see page 19. Alternatively, check the Yellow Pages or call the Recycling Operators of New Zealand ph 09 488 9449.

MANAGING LIQUID WASTES



Liquid wastes from construction sites are a significant pollution problem and should be minimised. Mud and silt from uncontrolled run-off is the most common pollutant.

Construction-site pollutants and their causes are:

Pollutant	Cause
Silt / mud	Run-off from cut and fill areas
Oil / fuels / paints	Spills and leaks
Cement / concrete	Wash-off from formwork and machinery
Detergent / degreasers	Wash-off from formwork,

RULE: DON'T mix up drainage for the two types of liquids:

- *Stormwater drains:* for clean rainwater only, as it goes directly into watercourses: streams, lakes, harbours and beaches. Stormwater is untreated.
- *Wastewater drains or sewers:* for blackwater (i.e. sewage) and trade wastes only. It is treated before going into watercourses.

Make sure all site workers know the difference! Spills can be very costly for the polluter.

REVIEWING PERFORMANCE

At the end of the construction project it is important to review how well your waste minimisation initiatives worked. Lessons learnt can be put into action in the next project.

Some key questions to ask:

Did you achieve your set targets?

Was the exercise of financial benefit?

How did the waste quantities estimated compare to those actually generated?

Were the waste records accurate and complete?

Were the site workers responsive to waste minimisation?

Did you solve any problems encountered?

And lastly - what could be improved for next time?

Typical benefits from sorting construction bin waste (based on landfill costs at \$60 per tonne*)

- 50-55% reduction in waste going to landfills
- \$37-\$47 saving per tonne sorted

*From C Patterson: *'Report on a Sorting Trial of Construction Bin Waste'* (July 1997)

DESIGNING OUT WASTES

In Auckland alone, about 146 000 tonnes of construction waste is dumped in landfills every year. That's 30kg per week for every person in the region! Studies have shown that much of this waste could be avoided or reduced through thoughtful design. Thoughtful design considers:

- accurate and integrated project management, which reduces the level of mistakes/rework
- creating a 'buildable' design – that is, one which allows for a logical sequence in construction and avoids variations on site
- using modulated and/or standardised components - both in the space and material sizes so that cutting sheet materials is reduced to a minimum.

Alternatively, much of this waste can be recycled and re-used, using readily available methods.



MANAGING MATERIAL WASTES

Good waste reduction needs a bit of organisation. At the very start of a project the possibilities for material recycling need to be established. This should be done by talking to waste contractors and recyclers. A cost / benefit analysis can then be performed, based on the separation requirements and markets available.

A waste management plan setting out aims and assigning responsibilities can then be drawn up. Although each plan will be site specific, there are general principles that apply to all sites. The plan should:

1. assign overall responsibilities for the waste management
2. estimate the waste amounts and types involved
3. identify the waste destinations and transport modes
4. set a target and ways to track resources
5. determine where new/used materials will be stored
6. ensure that everyone on site is familiar with the aim of the plan.

From this waste management plan, specifications can be developed for bid/contractor packages, outlining procedures for salvage, re-use and recycling. The six general principles are elaborated on in the following pages...

SHORT-CUTS TO BETTER WASTE MANAGEMENT

In a hurry? Here is an ‘in-a-nutshell’ guide which covers the key waste management principles discussed in this booklet. The numbers in the margin refer to the pages of this guide where further information can be found.

A: Draw up a list of site waste materials that are generated in bulk and have a ready market. Assign possible recycling/re-use methods next to each material. Put the list up on the noticeboard and inform all site workers at the initial Health and Safety meeting.

B: Make sure recycling bins are:

- clearly labelled on each side
- easily accessible
- at the same place on the site as all the other bins
- taken away only when they are full.

C: Record amounts of material salvaged and monitor costs/savings in a site diary.

D: At project’s end, assess how it could have been improved.

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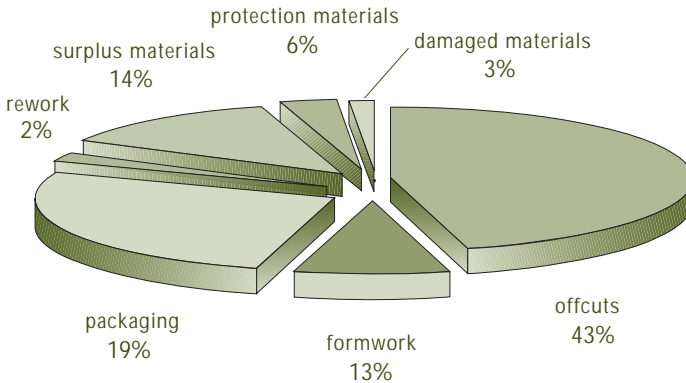
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6. Make sure everyone knows about the waste management plan

This will ensure that all workers know what is involved. Encourage worker participation by setting up an 'Ideas Board' for waste-related suggestions.

The causes of construction material waste can be grouped into the seven categories shown below:



Source: 'Preliminary Investigation into Construction and Demolition Waste in the Auckland Region'. Auckland Regional Council and Auckland City Council. July 1995. Auckland.



1. Assign responsibilities

Reducing construction site waste is a team effort! Whoever is in charge of waste minimisation needs to be enthusiastic about championing the project.

2. Estimate waste amounts

Start off with the usual waste percentages and see how you compare at the end. If you have no basis for comparison, use the New Zealand construction industry averages given below.

EXPECTED WASTE PERCENTAGES GENERATED BY WASTE TYPE

Material	Estimated Waste
Cement board	7%
Timber	11%
Plasterboard	13%
Particleboard	9%
Concrete	5%
Fixings	4%
Roofing	6%

3. Identify waste destinations

Find out the available local recycled/recovered materials outlets (see pg 18, 19) and what opportunities there are for collection.

4. Set targets and track progress

Set a definite objective. It could be *‘to reduce waste by 20% over the next 12 months (or by project’s end)’,* or *‘recycle all construction waste materials for which an easily accessible market exists’.*

Keep track of your wastes by assigning someone to estimate quantities (by eye-balling volumes), grouping materials by type. Keep records of the waste removed, wastes recycled and the related costs/savings (see example below).

5. Decide where to store materials

Keep new materials safe from knocks and weather and store recyclable/re-usable materials where they can be removed easily. (Store new materials separately from waste materials!)

TYPICAL WASTE RECORD

Project:		Waste Manager:			Date:
Recycled material	Estimated quantity used	Estimated % wasted	Estimated quantity recycled, re-used etc	Actual quantity recycled, re-used etc	Actual cost or saving? (see landfill disposal)
Untreated timber	85 m ³	6%	3%	3%	Saving \$40
Concrete					
Mixed metals					
Etc					