



CMP - WASTE MANAGEMENT PLAN

EMIRATES WOLGAN VALLEY RESORT DEVELOPMENT

Date: November 2006

a Coffey International Limited company



Clifton Coney
Group

Redefining Project Management

WASTE MANAGEMENT PLAN

This Waste Management Plan comprises the following sections:

- Land use or activity proposed
- Details of waste management
- Type and amount of waste to be generated
- On-site storage and treatment of waste
- Disposal of left over waste
- Ongoing management of waste for the life of the building

Details of Waste Management

The forms shown overleaf are templates to identify how much waste may be generated and how to dispose of it.

Two forms of waste management are required:

- For the demolition and excavation phase.
- For the construction phase.

The Building Works Contractor will need to specify the type of waste for each phase of the project.

Types of waste are as follows:

Demolition/Excavation

bricks
tiles
concrete
timber
plasterboard
windows, doors
metals (including roofing, guttering, pipes)
excavation materials
greenwaste
fixtures and fittings
carpet and underlay
linoleum
vinyl floor covering
hazardous waste e.g. asbestos

some waste will be hard to identify/quantify beforehand such as hidden plumbing, electrical systems, drainage etc.

Construction

excavation material
green waste
bricks
tiles
timber
concrete
plasterboard
metals (including roofing, pipes, caps)
plastics including pipes and gutters
insulation materials
cardboard packaging
sundry waste such as paint tins, glue
cartridges etc.

The contractor is to discuss project waste with subcontractors and include the waste in the contractors planning process.

Details of Waste Management - Demolition Phase

MATERIALS ON-SITE			DESTINATION		
Type of Materials	Estimated		Reuse and Recycling		Disposal
			ON-SITE	OFF-SITE	
	Vol (*m³)	Wt (*t)	· specify proposed reuse or on-site recycling methods	· specify contractor and recycling outlet	· specify contractor and landfill site
TIMBER	20				
Oregon beams			separated	re-milled furniture	
Kauri flooring			separated	reused as flooring	
Softwood			separated	chipped for mulch	
Doors, windows (12)			separated	sold for reuse	
METAL	100				
Purlins, lights, doors, windows				scrap	
Purlins, drum, roofing				on-sold for reuse	
CONCRETE	400				
Blocks, slab			crushed on-site, sold for road base		
Cement wall tiles			crushed reused on-site for back fill		
Asbestos	30				
Green Wase	10			mulched	
General Waste	20		PLEASE NOTE ►		
P/board, wire, rubble					

Details of Waste Management - Construction Phase

MATERIALS ON-SITE			DESTINATION		
Type of Materials	Estimated		Reuse and Recycling		Disposal
			ON-SITE	OFF-SITE	
	Vol (*m³)	Wt (*t)	· specify proposed reuse or on-site recycling methods	· specify contractor and recycling outlet	· specify contractor and landfill site
Bricks	20	20		Rock and Dirt - crushed	
Hebal blocks	30	20		Rock and Dirt - crushed	
Laminated plywood beams	10	5			
Plasterboard	12	6		delivery by self to CSR	
Timber	10	5			
Tiles	4	3		Rock and Dirt - crushed	
Pavers	6	4		Rock and Dirt - crushed	
Plastic wrapping	0.5		Reused on-site as covers		
Mixed waste	5				
			PLEASE NOTE ►		

Ongoing Management of Building

Lithgow City Council will require that a large part of the contractor waste management plan is dedicated to the use and ongoing waste management of the building. Each type of building such as the Main Building and the Maintenance Facility require waste facilities to be designed especially for the premises.

Council will provide details of their particular guidelines and regulations.

The contractor is to provide a plan indicating the location of each waste bin on site.

TYPE OF WASTE TO BE GENERATED	EXPECTED VOL. PER WEEK	PROPOSED ON-SITE STORAGE AND TREATMENT FACILITIES	DESTINATION
Please specify e.g. food waste, glass, paper, metal, off-cuts etc.	Litres or m ³	e.g. waste storage and recycling area, garbage chute, on site composting compaction equipment	<ul style="list-style-type: none">• recycling• disposal• specify contractor
paper/cardboard from office	120 litres	stored in basement area awaiting collection	Visy Recycling
Household recyclables (bottles, cans, paper etc.)	55 litres per townhouse	Stored in designated laundry cupboard awaiting collection	Council recycling service (weekly)
Food and garden waste	15 litres per townhouse	Composting area incorporated in rear yard	Composted on site
Other waste	80 litres per townhouse	Stored in mobile garbage bins awaiting collection	To landfill by Council (weekly)

Waste Management Plan Checklist

After award of tender, the contractor will need to complete the following stages to satisfy council requirements:

- Fill in details of project using council's application form.
- Estimate volumes of waste generated.
- State whether waste is mixed or separated and disposal details.
- Provide a site plan showing location of bin(s) and/or stock-piles is necessary off-site.
- Negotiate an agreement with the waste contractor that includes:
 - recycling opportunities and requirements
 - mixed or leftover waste landfill
 - verifying waste destination
- Select waste contractor.
- Includes plan for ongoing management of waste.

ESTIMATING QUANTITIES OF WASTE

The following process is used to estimate waste:

- A. Quantify materials for the project
- B. Use margins normally allowed in ordering
- C. Copy these amounts of waste into the Waste Management Plan

The following percentages are building “rule of thumb” and relate to similar projects

Timber	5 - 7%
Plasterboard	5 - 20%
Concrete	3 - 5%
Bricks	5 - 10%
Galvanised Iron Sheetting	2 - 5%

These amounts are supplied from demolition and waste contractors and staff at transfer stations. While not entirely scientific they do provide a useful guide.

Timber	= .5 tonne per m ³
Plasterboard	= 2.4 tonne per m ³
Concrete	= 1 tonne per m ³
Bricks	= .75 tonne per m ³
Steel	= 2 - 4 tonne per m ³

In order to improve the contractor’s estimates and provide more reliable figures:

- Compare projected waste quantities with actual waste produced.
- Conduct a waste audit of current projects.
- Note waste generated and disposal methods.
- Record this information to help estimate future waste management plans.

Waste Management Responsibility

The contractor generates the waste during the project and is the owner of the waste and is required to complete the waste management plan.

Builder Responsibilities:

- Undertake to meet the 60% reduction target.
- Identify a waste “handler”, to take charge of the waste plan.
- Timetable monthly reports on how the plan is working.
- Develop new purchasing policy with suppliers - buy less waste, specify no packaging.
- Instruct subcontractors in writing about their role in the plan.
- Revise and improve the plan with each new project.
- Choose waste contractors who will comply with the plan.

Subcontractor’s Responsibilities:

- Not to place builder in breach of the waste regulations.
- Comply with waste management directions of the builder.

Waste Contractor’s Responsibilities:

- Comply with reasonable directions from the Regional Waste Boards and respective councils.
- Provide accurate reporting on waste removed - amount, type, destination.
- Disposal of waste in the agreed manner.
- Be familiar with client’s Waste Management Plan.
- Discuss new and improved waste services with main contractor.

Waste contractors are required to provide the following information to the main contractor:

- Reduction of waste weight to landfill.
- Verification of destination of materials recovered.
- Total data on material recovered from site.

Education and Training

Education and training are vital to the success of waste reduction.

- The contractor is required to educate staff to understand the need for waste minimisation.
- Train staff in waste management procedures using signage, posters and other information to reinforce key messages. Initiate waste reduction in the staffroom and site offices:
- Reuse and recycle paper.
- Sort food waste for recycling - cans, bottles, food scraps.
- Encourage BYO lunch practices.
- Give each staff member their own mug for takeaway coffee.

Education and training programs should include:

- Awareness and knowledge of WMP.
- Understanding of the different roles and responsibilities that make the plan work.
- Knowledge of the overall waste minimisation goal.
- Procedures for reducing waste.
- Incentives to increase efforts e.g. rewards, competitions, challenges.
- Celebration of success.

TAFE NSW and EPA NSW have prepared a manual aimed at the construction and demolition industry. Minimising Construction and Demolition Waste is a learning source that supports TAFE courses. Copies of this detailed package are available from your local TAFE college. Copies are also available from Lithgow Council.

Waste Wise Construction, initiated by ANZEC, is a program that pioneered best practice waste reduction in the construction and demolition industry. Five major Australian construction companies participated in the project. For copies of the report on this project contact: Environments Australia on (02) 6274 1700.

MANAGING WASTE ON-SITE

The different stages of the project will place different demands on waste management.

Stages of Project

1. Demolition

- Licensed demolisher does the entire job and provides a report.
- Negotiate beforehand which materials are left behind for reuse.
- Collect waste receipts for contractor records.

2. Excavation

Clean fill

- Stock pile and backfill (reuse).
- Take to another site and reuse or send to landfill.

Greenwaste

- Stock pile and backfill (reuse).

3. Construction

- Appoint supervisor to oversee waste.
- Identify waste materials before work commences.
- Consider site offices, sheds and day-to-day waste produced by staff and subcontractors.
- Identify reusable and recyclable materials from existing buildings.
- Involve waste contractors to ensure records will be kept and waste targets met.
- Develop disposal procedure:
 - Specify number and types of containers - allowing for different stages in the project.
 - Organise signage and location of bins, skips and stockpiles.
 - Designate areas for reusable, returnables and recyclables.
 - Keep separate waste materials clean.
 - Provide training and education to ensure waste management objectives are met.

4. Fit out and finishing

The number and variety of trades working together plus budget and time constraints make this the most important stage in the waste plan.

Site arrangements will require:

- Allowing space for a dedicated cardboard skip for packaging waste of cardboard compactor.
- Separate plasterboard and keeping it clean for recycling.
- Arranging more frequent waste pickups.
- Maintaining a clean waste stream.

Waste Minimisation

The contractor is required to use the Waste Minimisation hierarchy as a basis for reducing waste.

- AVOID - waste at source
- REUSE - materials and components
- RECYCLE - materials into new products
- DISPOSE - in responsible manner as last resort
- RECOVER - valuable **resources** from the waste stream for recycling and reuse.

Resources Recovery reduces disposal costs, prevents further environmental damage and saves resources for future use.

WASTE AVOIDANCE

The project team has designed the project for waste minimisation.

Design and Planning Stage

- Design to standard sizes.
- Specify modular and prefabricated construction techniques.
- Specify recycled and recyclable products.

Construction Stage

- Order to size.
- Order pre-cut, prefabricated materials.
- Reduce packaging at source:
 - Return packaging to supplier.
 - Purchase in bulk.
 - Ask for cardboard or metal drums instead of plastic.
 - Request metal straps rather than shrink wrap.
 - Use returnable packaging such as delivery and storage pallets and reels.
- Educate site workers in avoidance procedures.
- Ensure that subcontractors use new purchasing guidelines.

With careful planning and design many materials can be reused during each stage of the project.

Demolition Stage

- Separate, reuse materials for new project on or off-site.
- Sell to second hand market.

Construction Stage

- Design for reuse of materials from demolition stage.
- Reuse timber formwork.
- Use corrugated iron as formwork
- Encourage other trades to reuse "waste".
- Reuse carpet as surface protection.

Excavation Stage

- Reuse rock, soil, vegetation on-site.
- Stockpile for use elsewhere - there is a guaranteed market for quality rock materials for building and landscaping.

RECYCLING OF WASTE

The contractor is required to:

- Provide clean uncontaminated material acceptable to the recycler.
- Organise on-site sorting and/or collection systems for processing including:
 - colour coded, clearly labelled bins
 - signage
 - timetable and skip pickups
- Investigate potential markets as part of waste planning.
- Participate in recycling opportunities.
- Train staff to recover recyclable materials.

Reuse and Recycling Potential of Construction and Demolition Materials

MATERIALS	PROCESS		END USE	POTENTIAL
Concrete	crushed	recycled	fill, leveling, road base	100%
Surplus pour	use up	pavers, slabs		high
	cleaned	reused	construction	100%
Bricks	crushed	recycled	landscaping, driveways, drains	100%
	cleaned	reused	roofing, landscaping	100%
Roof tiles	crushed	recycled	landscaping, driveways, drains	100%
Plasterboard (clean)	reprocessed	recycled	new plasterboard	100%
Hardwood beams denailed	reuse		flooring, furniture, fencing, craft	100%
Other timber	cleaned/ground	reused	formwork, bridging, propping, landscaping, wood flour (oil spills)	high 100%
Doors, Windows	cleaned	reused	second hand market	market driven
Fittings	cleaned	reused	second hand market	market driven
Glass unbroken	crushed	recycled	aggregated for concrete products repairs, glazing, glass houses.	100%
Carpet - wool		reused	mulsh, landscaping	
Under felt - natural	reuse		compost cover, mulch, landscaping	high
Synthetic rubber (as an underlay)	shredded	recycled	safety barriers, speed humps	new markets
Trees	relocated	reused	landscaping on or off-site	100%
Greenwaste	shredded	recycled	compost cover, mulch, fertilizer	100%
Soil	screened	reused	topsoil	100%
Metals; aluminum, copperhead, steel	scrap material	recycled	new metal products	100%
Packaging; Cardboard		recycled	new packaging	100%
Plastic/Steel drums	cleaned		reused	100%
Metal strapping	reused		return to supplier	high
Paint tins		recycled	tine extracted	100%

DISPOSAL

The contractor is required to establish arrangements with Lithgow Council for the identification of the nearest waste transfer station.