

CIAL New Passenger Terminal



Christchurch International Airport new terminal

Introduction to the Project

This waste reduction case study demonstrates that with careful on-site and off-site waste sorting, at least 77.8% of demolition and construction waste can be recovered for reuse and recycling.

The Christchurch International Airport Limited (CIAL) new passenger terminal development project commenced construction in 2010 and was completed in April 2013.

Client: CIAL

Site: CIAL new passenger terminal

Demolition and Construction Contractor: Hawkins Construction

Demolition Waste Sub-Contractor: Frews Contracting Ltd

Construction Waste Contractor: Mastagard

CIAL agreed to participate in this Target Sustainability waste reduction project. The objective of the project was to reduce waste going to landfill and cleanfill.

Demolition Waste Recycling

With the assistance of Hawkins Construction and Frews Contracting, the CIAL demolition stage of the project achieved the following results:

Waste Materials	Reuse and Recycling	Disposal	Comments
Type	Off-site (tonnes)	Off-site (tonnes)	
Hardfill	516		This was a mixture of concrete overpours, bricks, tiles and glass. Hardfill was crushed to an AP100 specification and used by contractors on construction projects as a fill material at other sites.
Timber (untreated)	31		This was chipped and used as boiler fuel in commercial and industrial boilers in Christchurch.
Concrete	9,244		This was crushed to AP65 specification and used by contractors on construction and roading projects as a substitute to alluvial aggregate.
Scrap steel	494		The scrap steel was recovered and sold through the waste collection contractor's salvage yard.
Mixed demolition waste		1,779	This was general contaminated waste including insulation, treated timber, concrete and hardfill that was not suitable for reuse, mainly due to the attachment of internal finishes to recyclable elements. This was sent to landfill.
Asbestos		742	Asbestos was discovered unexpectedly during the demolition. This was treated appropriately and sent to landfill after appropriate health and safety measures were taken.
TOTAL (TONNES)	10,285	2,521	
Percentage	80.3%	19.7%	

NB: The figures in the table include actual tonnage as provided by Frews Contracting.

Demolition Waste Recycling

Hawkins Construction aimed to reuse and recycle at least 75% of the materials from the demolition project. They reused and recycled 80.3% (10,285 tonnes) of the materials from the demolition project.

Hawkins agreed a procedure with Frews Contracting to ensure that every demolition waste skip removed from site would be sorted off-site at Frews' recovery plant to allow recyclable materials to be separated and diverted from landfill. Frews compiled waste and recycling information and sent this information to Hawkins monthly.

Hawkins Construction and Frews Contracting did the following to achieve these results:

- Prepared a waste management plan with a clear waste reduction target.
- Inducted all staff to the waste management plan.
- Held daily meetings to plan the day's salvage activities.
- Initially removed materials by hand, e.g. wooden floor boards, and then brought in heavy equipment to break apart concrete and steel structural components.

Hawkins was on track to achieve a higher amount of waste diverted from landfill, however asbestos was discovered on-site which affected the final figures.

In addition to the waste material reuse and recycling achievement, many materials were reused including:

- Portacom building previously on the airport roof was lifted off the building and relocated to the Charleston Caving Base.
- Relocated 8 light poles from site to Ruapuna Speedway.

- Donated 30 bench seats, each seating four people, to the Youth Glide Canterbury training facility.
- Relocated 6 mature pin oak trees from the site to a section of road between Wairakei and Harewood Roads.
- Offered shrubs within the garden beds to staff – 150 were re-homed.
- Refurbished an aerobridge which was sent to Wellington to be reused.
- Reused kitchen appliances from the demolished staff room in the new staff room.



Televisions from the old terminal to be reused off-site © Copyright



Carpet tiles destined for reuse off-site © Copyright

Construction Waste Recycling

With the assistance of Hawkins Construction and Mastagard, the CIAL construction stage of the project achieved the following results:

Waste Materials	Reuse and Recycling	Disposal	Comments
Type	Off-site (tonnes)	Off-site (tonnes)	
Hardfill	194.2		Clean hardfill was used in the Lyttelton Port of Christchurch's Te Awaparahi Bay reclamation project.
Timber (untreated)	294.8		This was chipped and used as boiler fuel in commercial and industrial boilers in Christchurch.
Plasterboard	118.9		Uncontaminated plasterboard was sent for processing into a gypsum product for use in cement manufacture.
Metal	167.4		This was sent for recycling.
Cardboard	17.6		This was sent for recycling.
Paper	6.3		This was sent for recycling.
Plastic	4.4		This was sent for recycling.
Glass	20.7		This was sent for recycling – included glass bottles from staff and contractors.
General		657.1	Materials such as treated timber, contaminated or other general non-recyclable waste. This was sent to landfill.
TOTAL (TONNES)	824.3	657.1	
Percentage	55.6%	44.4%	

NB: The figures in the table include actual tonnage as provided by Mastagard.

Construction Waste Recycling

Hawkins Construction aimed to reuse and recycle at least 75% of the materials from the construction project. They reused and recycled 55.6% (824.3 tonnes) of the materials from the construction project. Although demolition and construction occurred at the site concurrently, they occurred in separate areas of the site. There was no contamination between construction and demolition skips.

For the majority of the project, due to space and security requirements, Hawkins was limited to single skips for collection of waste at the construction site. Segregated collection waste skips were used for landside (the part of the airport before security checks) works at early construction stages. To maximise recycling potential at airside (beyond security checks and where the aircraft are) construction works, Hawkins set up an off-site sorting area which was manned by two dedicated resource recovery staff to divert as much construction waste as possible from landfill. Mastagard took sorted waste from the site and compiled waste and recycling information which was sent to Hawkins monthly.

Hawkins did the following to achieve these results:

- Prepared a waste management plan using the REBRI (Resource Efficiency in the Building and Related Industries) Construction Waste Plan.
- Initiated and managed an off-site waste sorting area manned by Hawkins staff to sort construction waste into various streams. This was necessitated by site space constraints, meaning only single skips could be located around the construction site.
- Located a co-mingled recycling collection unit outside the staff room for staff and sub-contractors to use.
- Placed clear signage on all collection units.
- Timber off-cuts were kept in a separate pile for on-site reuse.



Collection of metal, plastic, plasterboard and general waste in the off-site sorting area © Copyright



Skips for segregated waste collection prior to going to the off-site sorting area © Copyright



Plastic waste after sorting at the off-site sorting area © Copyright



Recycling collection system outside contractor staff facility © Copyright

Difficulties

- Off-site sorting meant that sub-contractors couldn't segregate waste, meaning potential recyclables were contaminated in the waste collection skips. This meant waste diversion targets were not achieved. It was especially obvious at later stages (finishing) when glues, sealants and paint sometimes found their way into the skip. **TIP: If segregation at source is not possible, have a smaller bin beside the skip for materials that could contaminate a skip, such as paint, glues and sealants.**
- Getting waste and recycling information from sub-contractors who took their own material off-site was difficult. **TIP: Make the provision of the quantities and types of waste, recycled and reused materials taken off-site a mandatory part of a sub-contractor's contract.**

Summary

The Christchurch International Airport Limited (CIAL) new passenger terminal development commenced construction in 2010 and was completed in April 2013. The project includes new check in and departure halls, new food and beverage outlets and a new baggage sorting system.

"For CIAL, as the client, it was simple, not arduous. The process fell back on Hawkins (the contractor) and how they managed the project. All I had to do was make sure Hawkins was meeting our obligations. The consultants from Target Sustainability took responsibility for the project and therefore there were no hassles for us as the client. The consultants were constantly checking the progress of the project and came to us with updates and any concerns. In addition, the consultant was very clear with the contractor about what was required of them."

"It was a painless exercise for CIAL that achieved a good result. However, having the right contractor who was engaged from the start was critical to the success of the project." Laurie Corbett, CIAL Project Coordinator for the development.

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The REBRI guides are available at www.rebri.org.nz