

60L GREEN BUILDING

The 60L Green Building is a leading example of how the environmental footprint (both construction and operational) of an office building can be minimised and still be a commercially-viable development.

60L's ENVIRONMENTAL PERFORMANCE BENCHMARKS

As compared to a conventional Melbourne commercial office building, 60L can claim the following achievements:

- Only 30% of the typical energy consumption
- Only 20% of the typical water consumption
- Significant use of re-used, recycled and recyclable materials of construction
- Provision of a healthy, pleasant and productive workplace

ORIGINS OF THE 60L PROJECT

In the 1990s the Australian Conservation Foundation (ACF) decided that it would use its own headquarters to create an example of best practice sustainable commercial building. So it partnered with ethical investment consortium, the Green Building Partnership, who purchased the site and constructed 60L in the existing brick warehouse, opening it in October 2002.

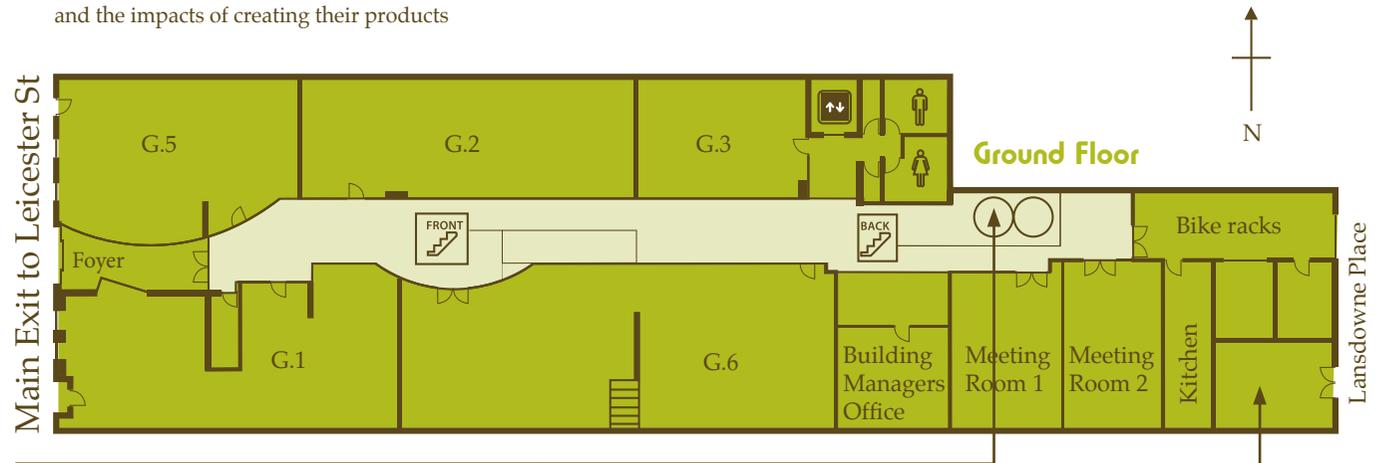
The Green Building Partnership owned and operated the 60L Green Building - with ACF as its largest tenant occupying a whole floor - until mid 2009 when it generously gifted the building to ACF to operate in perpetuity.

ACF's headquarters in the 60L Green Building embodies the organisation's holistic approach to sustainability. The 60L Green Building provides the fundamentals of smart design, open-plan layout, natural ventilation, lighting and energy efficiency.

60L has won a number of awards for excellence in sustainable design, including the Victorian Premier's Sustainability Award 2003 and the Banksia Award 2003 (winner of Leadership in Sustainable Buildings category).

MATERIALS

- 60L was constructed within the shell of an 1870s brick warehouse which allowed for the reuse of the brick walls and other materials
- All new materials brought onto the site were then selected carefully for their environmental properties including:
 - Recycled content, components or whole products where possible
 - Non-toxic, low-chemical emissions products
 - Durable, long-lasting materials
 - Purchased from manufacturers who minimize the resources used and the impacts of creating their products
- Timber - mostly recycled (flooring, handrails of stairs, stair treads, all door and window frames, tops of balustrades etc). Any new timber has been from plantation pine
- Concrete - all new concrete contains about 60% recycled material (aggregate and fly-ash)
- Steel - all reinforcing steel in the new concrete is recycled. No recycled steel has been used for the structure
- Bricks - either reused from the old building or second-hand bricks from off-site



RAINWATER COLLECTION

- Rainwater is collected into two 10,000 litre tanks on the ground floor
- Rainwater comes from all of the upper roof and the glazed atrium roof
- The combined roof collection area is about 1000 m² so that for every 1mm rainfall, about 1000 litres of rainwater is collected into the two tanks
- Despite lower than average rainfall over the past five years, 60L has been able to collect and use about 400 kL every year
- Rainwater supplies all fresh water needs in the building except for the emergency fire sprinklers
- Three stages of micro-filtration remove any particulate material and large organisms and a UV sterilisation unit kills any residual bacteria and other organisms

WATER EFFICIENCY

- 60L uses 1000 litres/day of potable rainwater and 2000 litres/day for flushing toilets and irrigation - a total of 3000 litres/day on average
- This represents about 15 litres/day for a building population of 200 people - less than half of that for a conventional building
- This is achieved by using rainwater and recycled water plus water efficient fixtures and fittings such as:
 - Low flow taps and shower heads
 - Low flush-volume toilet cisterns
 - Water-less urinals

GREY AND BLACKWATER TREATMENT

- Full treatment of both grey and black-water generated in the building is done to a standard suitable for recycling for flushing the toilets and for sub-surface irrigation of landscaping
- This means that net mains water consumption is reduced to less than 10% of that of a conventional building of similar size, in an average rainfall year
- Residual bio-solids from the primary sedimentation tanks are removed to the mains sewerage system at the rate of about 3% of input

PEOPLE, PRODUCTIVITY AND GREEN LEASE

Green Buildings are healthier workplaces

A key objective of the 60L project was to create a healthy and pleasant work environment - this also means a more productive workplace. This is achieved through greater natural lighting, fresh air, a significant degree of local control over workplace conditions (e.g. air-conditioning), reduced levels of toxic VOC emissions, a break-out area in the roof-garden, and the good feelings generated by working in an award-winning, environmentally responsible building.

A survey of 60L occupants carried out by an independent organisation found that more than 60% of building occupants had a perception that their own productivity had increased by at least 10% compared with their previous workplace. A separate survey conducted for the Australian Conservation Foundation of their 1st floor premises, found that the perception of workplace productivity had increased by more than 15% compared with their previous premises in Fitzroy.

Cycling

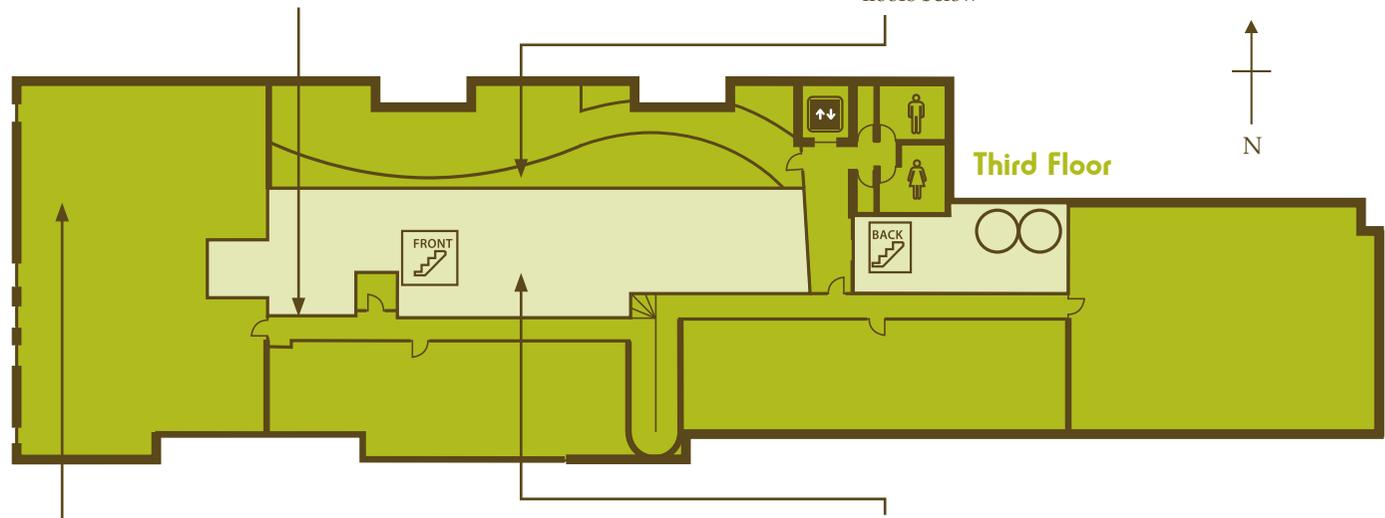
Tenants are encouraged to cycle to work (or walk or use public transport): there is no car-parking on-site and instead a large bike room provides secure storage. Showers are provided on each floor for cyclists to use. Cycling means less greenhouse pollution and is also a health benefit for tenants.

Green Lease

A Green Building also requires the co-operation of tenants for it to operate efficiently and to ensure tenant office fit-outs are also efficient. 60L has a Green Lease agreement with all tenants to ensure they install energy and water efficient appliances and fittings, minimise chemical emissions, operate the building features such as air-conditioning, louvres, blinds and water systems efficiently, and educate their staff about the building.

HEATING COOLING AND VENTILATION

- 60L uses automated louvres and thermal chimneys to maximise fresh air ventilation with minimal energy inputs and without the need for centralised air-conditioning
- The design includes a large central atrium which allows air to flow across tenancies from the light wells and into the atrium from where it is then vented to the atmosphere through four thermal chimneys
- Computer-controlled louvre windows in all tenancies and on the chimneys operate according to outside air temperatures recorded by the roof top weather station
- Tenants can also control air flows through openable windows and louvres in the office areas. When outside temperatures are very hot or cold, tenants can use small domestic-sized, reverse-cycle air conditioners for heating or cooling their space



RENEWABLE ENERGY

- Energy is sourced from both:
 - on-site solar photovoltaic arrays and
 - 100% new green power by 60L's electricity retailer
- Zero Greenhouse Gas emissions have therefore effectively been achieved for operating the building
- Greenhouse Offsets of Construction – the carbon footprint of the building's construction has been offset by timber plantations on farms in the western district of Victoria

60L



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FOUNDATION

www.acfonline.org.au/60L

ROOF GARDEN

- The roof garden is a recreation space for tenants which features local native plants and a shaded lunch area
- Except for the vegetable plot, the roof garden is watered by recycled water from the building sewage treatment plant
- It also acts as an insulator from heat and cold for the floors below

ENERGY EFFICIENCY

- Energy consumption has been cut by the use of:
 - the hybrid ventilation system (the combination of passive building design and individually controlled air-conditioners) instead of a central air-conditioning system
 - a design for maximising daylight
 - efficient lighting - T5-type fluorescent lighting (low energy input, high light output)
 - energy efficient office and kitchen appliances
 - minimising use of the lift, with more prominent stairs
 - efficient use of water pumping system