

## Inner Melbourne Action Plan

### Progress Report

#### Action 9.2 – Environmentally Sustainable Design

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#### Purpose

1. To update the Committee on the progress of Action 9.2 Environmentally Sustainable Design — ESD Fact Sheets

#### Background

2. Each of the IMAP Councils identified that ESD Fact Sheets that relate to the topics embedded within the Sustainable Design in the Planning Process (SDAPP) set up by the Council Alliance for a Sustainable Built Environment (CASBE) are required to communicate to planning applicants to assist in preparing responses to Sustainable Design within their planning submissions.
3. Initial project team meeting, each project team member was assigned an ESD category to research and develop an ESD fact sheet for. The list of fact sheets includes:

Indoor Environment Quality - CoM  
 Energy Efficiency – CoS  
 Water Resources - CoY  
 Stormwater Management - CoY  
 Building Materials - CoPP  
 Transport - CoPP  
 Waste Management - CoPP  
 Urban Ecology – CoS  
 Innovation – CoS  
 Ongoing Building and Site Management - TBD  
*Melbourne Climate (including adaptation) - CoY*  
*Rating Tools - CoM*  
*External Shading - CoY*  
*Finding Green Services and Products - CoPP*

4. The fact sheet content has been developed to follow a consistent structure which includes:  
**Awareness:** of the need for change; e.g. a negative or positive household/environmental fact .... did you know that or % of etc.  
**Desire:** to support and participate in the change; e.g. what is the benefit for ME? Save money? Improve comfort?  
**Knowledge:** of how to change; the body of the Fact Sheet  
**Ability:** to implement the knowledge; e.g. reference to further information and other organisations  
**Reinforcement:** to sustain the change; e.g. other factsheets in this series, register for Council's environmental newsletter.

#### Discussion

5. The Murray Betts Group (MBG) were selected out of a total of 4 submissions as the preferred consultant. Having had extensive experience with the City of Stonnington their portfolio was impressive and demonstrated capacity to deliver what was required for the ESD Fact Sheets project.
6. Once each fact sheet had been developed into a draft format by each of the IMAP Council representatives they were then uploaded to Basecamp, which is a project sharing website which has been a very useful tool to collaborate across Council and with MBG.

7. MBG would then take the draft fact sheet and have them professionally edited and then post them back onto Basecamp for review by the project team.
8. While this review of the text took place, MBG then developed illustrations that would feature on the specific fact sheet, and also developed a template layout for all of the fact sheets that included a location for each individual Councils logo on the front page and the IMA P logo on the rear page.
9. Due to time and cost constraints the decision was made to ensure that the ten key Sustainable Design categories are completed initially and then the additional four categories (plus others that have been discussed) are developed at a later stage.
10. MBG have also provided quotations for a folder for the set of fact sheets to fit into, as well as a cover fact sheet that explains SDAPP and how the ten key categories assess Sustainable Design.
11. It is expected that the initial part of the project (10 fact sheets, folder and cover fact sheet) should be completed by the end of March.
12. That the Committee note the Action 9.2 approved funding of \$20K in 2010/11 and \$15K in 2011/12 has been fully quoted for the project. At this stage only \$2805 has been paid, however more work has been completed which will be invoiced in the next few weeks. A purchase order of \$34 991 has been raised for the project.

### Recommendations

13. That the IMA P Implementation Committee resolves to **note** the progress comments provided and provide any feedback where necessary.

# Stormwater Management

Building design for a sustainable future

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## What's included in this fact sheet:

Why do we need to change our stormwater management practices?

How will best practice stormwater management benefit me?

How does my choice of stormwater management strategies impact on the environment?

- Rainwater Tanks
- Rain Gardens
- Porous Paving
- Drought Tolerant Landscaping
- Measuring Stormwater Management Performance

Where can I find out more?

Mandatory Requirements.

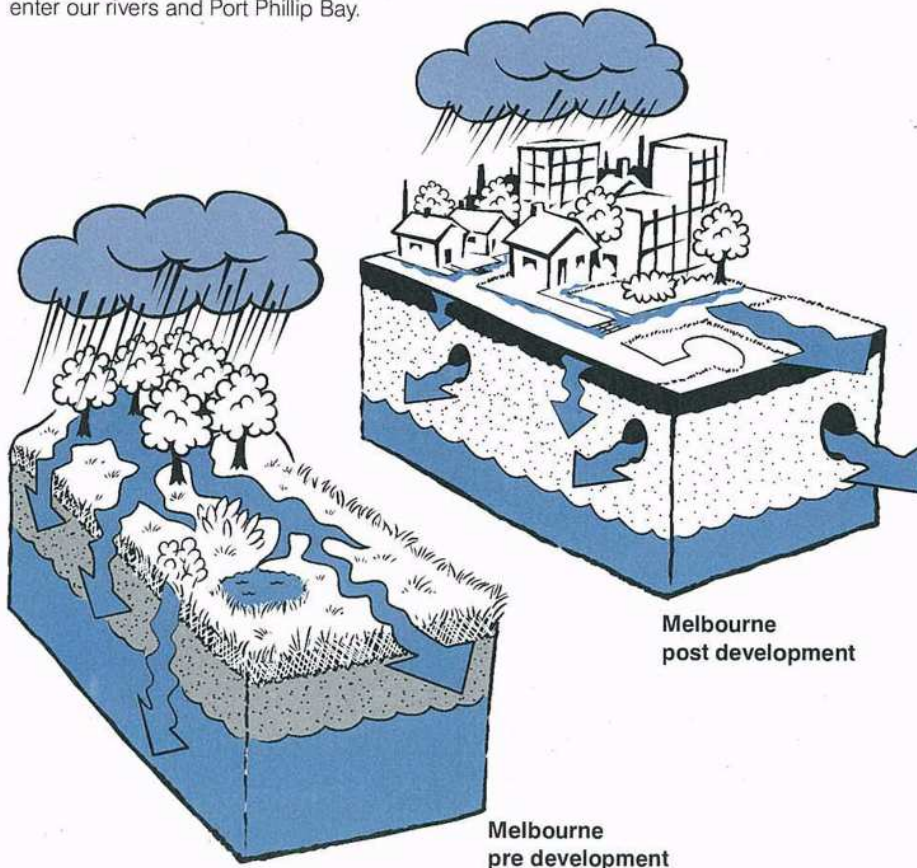
This Fact Sheet will assist you in making informed decisions about stormwater management practices to minimise negative impacts on the environment.

## Why do we need to change our stormwater management practices?

Melbourne's continued urbanisation and expansion has resulted in a dramatic increase in areas of hard and impervious surfaces, such as buildings, roads and car parks. Consequently, the majority of the rain that falls in urban areas is converted into run off, or stormwater.

Traditional stormwater management practices direct stormwater into urban waterways more frequently, faster and carrying more pollutants that ultimately enter our rivers and Port Phillip Bay.

The resulting increase in stormwater negatively affects the health and amenity of our waterways for people, plants and animals. Additionally, the large volumes of stormwater entering our waterways can cause flooding that damages both natural and built environments.



Melbourne  
post development

Melbourne  
pre development



## Some basic guidelines to manage stormwater



### How will best practice/improved stormwater management benefit me?

By employing Water Sensitive Urban Design (WSUD) strategies, you can capture, treat and reuse stormwater onsite to dramatically improve the quality and quantity of water entering our waterways. Integrating WSUD into your development will minimise its downstream impacts and also enables you to conserve potable (drinking) water by substituting it for rain water. WSUD strategies allow you to achieve the following outcomes and helps Melbourne transition to a water sensitive city.

- Improve water quality in streams and groundwater;
- Protect stream and riparian habitats for native plants and animals;
- Prevent erosion of banks along our waterways;
- Reduce flooding risk;
- Protect the scenic and recreational values of streams;
- Conserve potable water by providing an alternative water source for uses such as, but not limited to, irrigation and toilet flushing.

### How does my choice of stormwater management strategies impact on the environment?

There is enormous scope for creativity when building or renovating to incorporate a variety of WSUD strategies into your design.

Some simple measures to eliminate the negative impacts of stormwater and conserve potable water are outlined below:

Measure	Water Quality	Water Quantity	Potable Water Substitution
<b>Rainwater tanks</b>	Not Applicable	Highly Applicable	Highly Applicable
<b>Rain Gardens &amp; Swales</b>	Highly Applicable	Highly Applicable	Moderately Applicable
<b>Pervious pavers</b>	Moderately Applicable	Moderately Applicable	Not Applicable
<b>Drought tolerant landscaping</b>	Not Applicable	Not Applicable	Highly Applicable

### Rainwater Tanks

Rainwater tanks are perhaps the easiest way to reduce the amount of stormwater leaving your property. They also have the added benefit of providing a water source that can replace drinking (potable) water in certain uses such as outdoor use, toilet flushing and clothes washing. By using stormwater to replace drinking water, savings of up to 50% can be achieved.

Tanks come in many different colours, materials and designs. They can be installed above ground, under ground, below outdoor decks, under buildings (if space allows), or even hidden within planter boxes.

Sizing rainwater tanks is contingent on a number of variables namely, rainfall, roof catchment area and proposed uses. There are now a number of free tools available to assist people in sizing their tanks. For more information on water tanks, see the resources section of this fact sheet.





## Some basic guidelines to manage stormwater

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### Porous Paving

Porous paving allows rainwater to pass through the pavers and soak into the ground, unlike standard concrete or block pavers. By using porous pavers you can:

- reduce the amount of 'impervious' surfaces on your block;
- increase groundwater recharge by allowing the water to soak through the soil;
- improve stormwater quality by filtering stormwater and reducing pollutant loads;
- reduce high flows during peak rain events entering the waterway from urban areas causing stream erosion and habitat scouring.

Porous paving is installed in the same way as traditional paving and is available in many forms. They can be used to replace asphalt, concrete or other impervious pavers.



Porous Paving will allow for drainage in urban areas

### Drought Tolerant Landscaping

The average Victorian family uses almost twenty percent of their drinking water in the garden. You can not only reduce your water consumption by reusing household water or rainwater, but also by maintaining a water-efficient garden. This can be done through simple measures, such as using mulch, maintaining healthy soil or installing a more efficient watering system.

Drought tolerant plants are also an excellent way to save water in the garden. They are better suited to our dry environment and create an attractive and low-maintenance garden.

### Rain Gardens

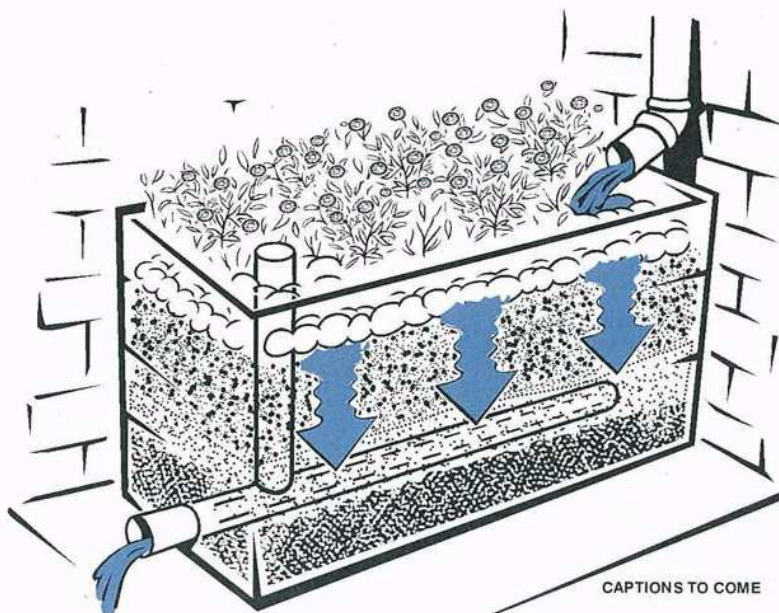
Installing a rain garden on your property is an easy way to reduce pollutant loads in stormwater while providing attractive landscaping. Rain gardens are designed to capture, filter and reduce the flow rate of stormwater from roofs or hard surfaces.

For more information on rain gardens, see the resources section of this fact sheet.

#### Rain garden sizing chart

AREA OF RUN-OFF (m <sup>2</sup> )	RAINGARDEN SIZE (m <sup>2</sup> )
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9

“Generally, the size of the raingarden should be approximately two percent of the run-off area. One square meter of raingarden commonly treats 50 square meters of hard surface.”



CAPTIONS TO COME



## Some basic guidelines to manage stormwater



### Measuring Stormwater Management Performance

To address and measure stormwater quality outcomes, the Best Practice Environmental Guidelines (BPEG) were developed and, published by the Victorian Stormwater Committee. These guidelines establish specific stormwater quality objectives to assist in determining the level of stormwater management necessary to meet the State Environment Protection Policy (SEPP) requirements. These guidelines are now a referenced document in the State Planning Policy Framework. The best practice performance objectives from the BPEG aim to remove:

- 80% of suspended solids;
- 45% of total Nitrogen;
- 45% of total Phosphorus from your site's stormwater runoff;
- 70% of typical urban annual litter load.

When applying for a planning permit, you may be required to demonstrate that your development proposal has met these performance targets. This can be done through the use of different tools.

For developments of up to 100 bedrooms, Melbourne Water developed STORM, a free and simple online stormwater calculator that helps you assess and improve your design's stormwater performance. Exceeding the 100% benchmark in the STORM tool confirms that your building design will meet Council's performance targets.

For developments of more than 100 bedrooms, we recommend using proprietary tools such as MUSIC and Urban Developer to simulate urban stormwater systems and their performance. These tools require a sound knowledge of urban stormwater management principles and practices.

### Where can I find out more?

#### STORM calculator

Melbourne Water  
[www.storm.melbournewater.com.au](http://www.storm.melbournewater.com.au)

#### Rain water tank calculations

Alternative Technology Association  
[www.tankulator.ata.org.au](http://www.tankulator.ata.org.au)

#### Rain gardens

Melbourne Water  
[www.raingardens.melbournewater.com.au/](http://www.raingardens.melbournewater.com.au/)

#### Stormwater Sensitive Home Fact Sheets

Melbourne Water  
[www.melbournewater.com.au](http://www.melbournewater.com.au)

#### Sustainable Landscaping and a list of water saver garden centres

Department of Sustainability and Environment  
[www.ourwater.vic.gov.au](http://www.ourwater.vic.gov.au)

#### Stormwater Management Education Programs

Clearwater  
[www.clearwater.asn.au](http://www.clearwater.asn.au)

#### Information about Victoria's water environments

Environmental Protection Authority  
Victoria  
[www.epa.vic.gov.au](http://www.epa.vic.gov.au)

#### Information about water and wastewater services

Water Services Association of Australia  
[www.wsaa.asn.au](http://www.wsaa.asn.au)

Other Fact Sheets in this series are also available to provide guidance on the 10 Key Sustainable Building Categories. For further information on Outdoor Environment Quality, consider the Fact Sheets entitled:

- Water Efficiency
- Urban Ecology

### Council's best practice standard

#### ESD principles

There really are two levels of compliance when it comes to ESD principles – mandatory and best practice.

#### Mandatory requirements

To meet Victoria's 6 Star standard, single dwellings with a rainwater tank must ensure it has a minimum capacity of 2,000 litres, have a roof catchment of at least of 50 square meters and be connected to toilets for toilet flushing.

#### Best Practice Standard:

Exceed Victoria's best practice standards by achieving a STORM rating of at least 100% or equivalent modelling results (MUSIC, Urban Developer).

Install larger rainwater tanks and connect as much roof area as possible to them. Use the harvested water for high demand areas such as toilets, irrigation and washing machines.



## SDAPP

Sustainable Design Assessment  
in the Planning Process  
10 Key Sustainable Building Categories



# 5.0

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# Building Materials

Building design for a sustainable future

## What's included in this fact sheet:

Why do we need to carefully consider our choice of building materials?

How will my choice of building materials benefit me?

How does my choice of building materials impact on the environment?

- Embodied Energy
- Retaining and re-using existing materials
- Specifying recycled materials
- Sustainably Sourced Timber
- Third Party Certification
- Ecospecifier
- GECA (Good Environment Choice Australia) Life Cycle Assessment

Where can I find out more?

Mandatory Requirements.

This Fact Sheet will assist you in making informed decisions about the materials you select for a project to help minimise their impact on the environment.

## Why do we need to carefully consider our choice of building materials?

Building construction currently consumes between 30-50% of raw materials worldwide. With significant growth taking place in the building sector, the burden being placed on limited resources is increasing – resources that one day will run out.

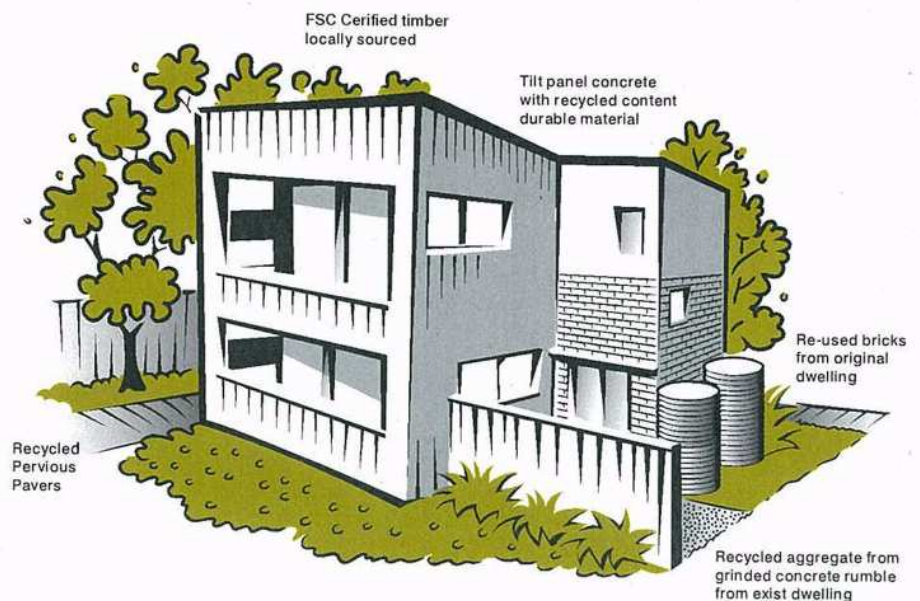
What's more, ongoing fitouts, extensions and/or refurbishments increase the environmental impact during a buildings' life cycle.

As a result, we need to make more informed choices with regard to the impact that material sourcing will have on the environment. These impacts will accumulate through:

- harvesting of raw materials,
- a material's high embodied energy,
- on-going maintenance requirements,
- and the capacity to be recycled

## How will my choice of building materials benefit me?

- By making informed choices about the materials you use in the construction and fitout of buildings, you can:
- assess the viability of reusing what you already have;
- save on construction and maintenance costs;
- design buildings that have a longer life span, by nominating durable materials such as brickwork, stone, and post consumer steel





# How does my choice of building materials impact on the environment?



## Embodied Energy

Buildings often consume large amounts of energy and therefore produce greenhouse gas emissions in the processes required leading up to the construction phase. Many natural resources require mining, processing refining and ultimately manufacturing, transport and delivery before they are utilised in construction. This is what's known as embodied energy.

The embodied energy of building products varies dramatically. For example, new or virgin aluminium window frames require up to 90 times more energy than timber window frames to produce. Generally non recycled metals contain the highest embodied energy, followed by plastics and other materials with a high chemical content. Natural construction materials such as timber, brick and render contain the least embodied energy.

To reduce the embodied energy of a typical metal and concrete structure, specify:

- metal produced from post consumer waste;
- concrete blends that include a percentage (e.g. 30 percent) of recycled content (cement extender including fly ash or blast furnace slag); and
- concrete that incorporates recycled aggregate wherever possible.

The sourcing of locally produced materials and products which are lower in embodied energy will also help in minimising their impact.

## Retaining and re-using existing materials

Embodied energy can be minimised by retaining and re-using existing building structures and materials, particularly if demolition of existing structures is required.

Therefore consideration should be made to re-use the existing materials within a new development in either their existing state or in a revised/renewed state. For example, grinded hard materials such as bricks and concrete may be re-used as aggregate. But also when building new, future recyclability through easy disassembly should be considered.

Consideration should be given to composite materials which are more difficult to recycle than raw materials. For example, facade and roof structures that are readily disassembled, are more likely to be reused than those that would be damaged when taken apart. If none of these options are possible, then ensuring that as much of existing materials are recycled and re-used off site should be the next option.

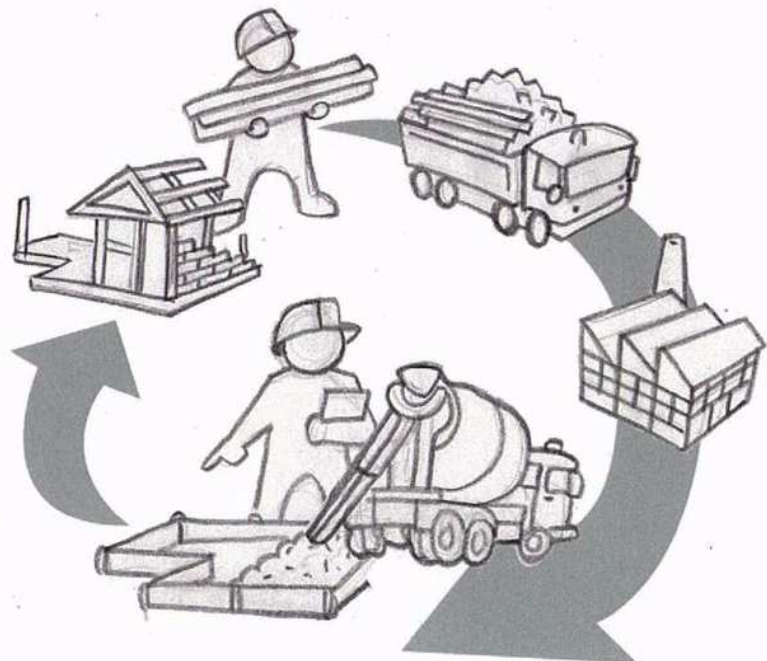
## Specifying recycled materials

Where practical, specifying recycled materials is a more sustainable practice than compared to specifying new materials. Not only will the materials' life span be extended and in turn reduce the amount of waste going to landfill, it will reduce the amount of embodied energy that can often be used as a key design feature of your project. For example, recycled timber can often be reused as new flooring and decking.

## Sustainably Sourced Timber

The high demand for wood products worldwide has led to large-scale illegal and unsustainable logging practices in some countries. With this in mind, we should all ensure that the timber products specified for a building development are sourced from renewable resources.

When specifying timber, ensure that it is certified through an accredited forest certification scheme such as the Forest Stewardship Council (FSC), or the Australian Forest Certification Scheme (AFCS).



Considering recycling when demolishing and building new.





## How does my choice of building materials impact on the environment?

### Life Cycle Assessment

Life Cycle Assessment is an emerging methodology that assesses the environmental impact of building materials by measuring the amount of resources required at the development, transport and disposal phases of its lifecycle. In other words a cradle to grave analysis. Whilst this would be the most accurate methodology for assessing the environmental impacts of buildings.

### Third Party Certification

Many materials and products that claim to be "environmentally friendly", "green" or "sustainable" do not live up to their claim. The most effective way to choose a sustainable product or material is to check for certification under a recognised standard such as ISO (International Organisation for Standardization) 14000 Environmental Management and ISO 9000 Quality Management. Choosing a material or product with either certification will ensure that production processes have been conducted to satisfy the requirements set out in the standard. In the case of ISO 9000, the quality and management systems of the supplier has been conducted independently by a third party to ensure that the standards have been met.

When specific information about a material is not available you should investigate the base materials to get an understanding of their production processes.

The recommended hierarchy in selecting materials for a project should be based on the following order:

- re-use existing materials where practical;
- re-use recycled materials;
- nominate materials that have minimal processes involved in producing them from their natural state;
- nominate locally sourced materials
- select materials that are durable, long lasting and require minimal maintenance throughout their life cycle; and,
- select materials that can be recycled and are also low in embodied energy.



### Ecospecifier

Ecospecifier is a web based resource that provides a list of recognised third party endorsed eco-products and materials, technologies and resources. The website has recently been made accessible to the public at no cost and is a leading global supporter of sustainable development and life-cycle assessed green product information.

### GECA (Good Environment Choice Australia)

Promotes the production and consumption of environmentally preferable products and services, thereby reducing environmental harm.





## How does my choice of building materials impact on the environment?

### Council's best practice standard

#### ESD principles

There really are two levels of compliance when it comes to ESD principles – mandatory and best practice.

#### Mandatory requirements

A new development or renovation must meet Australian Standards and the Building Code of Australia (BCA) requirements.

#### Best Practice Standard:

To meet best practice standards, there are a range of factors that need to be taken into consideration. When submitting Planning Application Drawings you must indicate materials on elevations and sections, as well as any supporting sustainable verifications in your Sustainable Design Assessment (SDA) or your Sustainable Management Plan (SMP).

#### Embodied Energy

Have efforts been made to reduce the embodied energy of the materials chosen?

- Has a commitment to substitute some cement content of concrete with fly ash or slag been outlined? (Note that there are construction program implications to this strategy due to increased curing time of the concrete.)
- Limited or no use of aluminium, zinc, titanium and other high embodied energy metals and materials in general, especially in a design with intended high churn (eg retail).
- Have efforts been made to select materials with low or no embodied water?

#### Habitat Destruction

- Have efforts been made to avoid materials that result in land degradation and habitat destruction from raw materials extraction?
- Has a commitment to source timber from sustainably managed source, with proof of audit trail been provided?

#### Recyclability/reusability

Can the materials selected be recycled or re-used? In Australia?

#### Toxicity

- Have efforts been made to avoid materials which are toxic in manufacture and use? eg PVC, Chrome, MDF

#### Transport

- A commitment should be made to give preference to locally made materials first, then Australian made, then internationally made.
- Where possible, specify materials that are shipped by sea rather than air.

#### Suitability

- Are the materials selected suitable for the intended application?

#### Maintenance/ Durability

- Are the materials selected low in maintenance requirements and high in durability, relative to the chosen application and life expectancy of the development?
- Are low toxicity/pollution/energy use cleaning agents required for ongoing maintenance?

### Where can I find out more?

#### Technical Manual - Materials

Your Home, Commonwealth of Australia  
[www.yourhome.gov.au](http://www.yourhome.gov.au)

#### Healthy Product Database

Moreland Greenlist  
[www.sustainablesteps.com.au/doc.html](http://www.sustainablesteps.com.au/doc.html)

#### Ecospecifier

[www.ecospecifier.com.au](http://www.ecospecifier.com.au)

#### Good Environment Choice Australia

[www.geca.org.au](http://www.geca.org.au)

#### Green Building Council Australia

Design Tools Material Credits  
[www.gbca.org.au/green-star/rating-tools](http://www.gbca.org.au/green-star/rating-tools)

**Other Fact Sheets in this series are also available to provide guidance on the 10 Key Sustainable Building Categories. For further information on Indoor Environment Quality, consider the Fact Sheets entitled:**

- Energy Efficiency
- Urban Ecology