

SUSTAINABLE BUILDING MATERIALS

SUTHERLAND SHIRE ENVIRONMENTAL
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SUTHERLAND SHIRE



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Sustainable Building Materials

This document provides information to assist you in making informed and sustainable decisions about your building projects. It provides guidance on dealing with building materials in accordance with the principles of ecologically sustainable development, encouraging the use of enduring and resilient design principles with materials that are high quality and require low maintenance.

Why should we carefully consider our choice of building materials?

Construction and building projects currently utilize 30-50% of raw materials globally. With increasing growth in these sectors, there is an increasing demand for resources that are finite and non-renewable.

When we recycle materials or choose more sustainable options, we help to reduce the consumption of energy, fuel, water and other valuable natural resources, as well as reducing greenhouse gas emissions and waste.

Continual extensions and renovations increase the building material's environmental impact during a building's life cycle. As a result, we must make more informed choices with regard to the impact that material sourcing will have on the environment. These impacts will accrue through:

- The harvesting of raw materials
- A material's high embodied energy
- Continual maintenance requirements
- Inability for recycling or re-purposing.

How will my choice benefit me?

When making informed choices about the materials you use in the construction of your project, you can:

- Evaluate the potential for reusing materials that you already have.
- Save on construction, renovation and maintenance expenses.
- Design and construct buildings that are low maintenance and long-lasting, by choosing durable materials such as brickwork, stone, and post-consumer steel.

Choosing sustainable, durable materials with low maintenance reduces the need for future remodelling / renovations, demolitions and helps to reduce waste.

Embodied energy

Embodied energy is a term that refers to the energy used during the processing, refining, manufacturing and logistics of natural resources and building materials. The embodied energy of building materials varies significantly. For instance, the processing of new aluminium window frames requires up to 90 times more energy compared to timber frames. Usually, new and non-recycled metals have a high level of embodied energy. Materials with high levels of chemical content such as plastics also have a high embodied energy. Natural building materials such as timber and brick contain the least embodied energy. In order to reduce the embodied energy of a building structure, you can preference:

- Recycled metals
- Low embodied energy materials. Minimize use of high embodied energy materials such as aluminium and zinc.
- Blended concretes that include a percentage of recycled content.

- Sourcing locally produced materials and products which are lower in embodied energy.

Re-using existing material

You can reduce embodied energy by re-using existing building materials and structures. Consideration can be given to the re-purposing of existing materials in a new development or refurbishment. For instance, crushed hard materials such as bricks and concrete can be re-purposed for aggregate. Seek to dematerialise your building project through reducing in the quantity of materials used.

When building new structures, actions can be taken towards future recyclability through consideration of easy disassembly, as well as giving preference to raw or natural materials, which can be more easily recycled compared to composite materials.

For instance, roof structures that can be more readily disassembled, are more likely to be re-purposed compared to those that would be damaged when taken apart. If these options are not feasible, then ensuring that existing materials can be recycled off site is the next best option.

Specifying recycled materials

When feasible, it is more sustainable to specify recycled products and materials compared to new materials, as recycled materials create less waste and can be re-purposed.

Third party certification

Many products are labelled as “green” or “environmentally friendly”, when often these claims are uncertified. An effective way to choose sustainable products is to check for certification from a recognised standard such as ISO (International Organisation for Standardisation) 14000 Environmental Management and ISO 9000 Quality Management. Choosing materials with these certifications will guarantee that production processes satisfy the requirements outlined in the standard. When specific information is not available, it is important to investigate the base materials and what production processes were administered.

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

- When practical, re-use or re-purpose existing materials.
- Re-use and specify recycled materials
- Specify raw materials with low embodied energy.
- Specify locally sourced materials
- Preference durable, long lasting materials that require low maintenance.
- Preference certified stockpiles.
- Source timber from sustainably managed sources that have third party certification.

Ecospecifier

Ecospecifier is a free online resource and provides a list of recognised, third party endorsed eco-products, materials, technologies, and sustainable building material alternatives.

Ecospecifier is a leading global supporter of sustainable development and life-cycle assessed sustainable product information.

GECA (Good Environment Choice Australia)

GECA is an independent sustainability and environmental certification program that promotes the production and consumption of environmentally sustainable products and services.

Life Cycle Assessment (LCA)

Life Cycle Assessment is a methodology that assesses the environmental impacts of building materials by measuring the amount of resources required at the development, logistics, and disposal phases of their lifespan. Life Cycle Assessment is an accurate methodology for assessing the environmental impacts of buildings, however it is not currently a feasible option for small scale individual buildings.

Sustainable Design Considerations

Aside from the choice of materials, sustainable building design features include:

- Passive solar design
- Building designs that maximise solar heat gain in winter and minimise heat gain in summer through orientation and use of shading.
- Use of insulation
- Hot water rating systems
- Design for natural light access, including consideration of window orientation (north/south windows)
- Design for good ventilation through ensuring windows, doors and vents have maximized air flow.
- Water Sensitive Urban Design features
- Solar PV installations
- Green roofs and walls
- Water catchment and storage facilities

Where can I find out more?

- Technical Manual Materials (yourhome.gov.au)
- Ecospecifier.com.au
- Good Environment Choice Australia (geca.org.au)
- Green Building Council Australia (gbca.org.au)