ESD AUSTRALIA

COMPLIANCE SOLUTIONS

BUILDING · ENERGY · ACCESS · BUSHFIRE

Sustainable Design
Check Sheet

2018

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Forward

This Check Sheet has been compiled by ESD Australia to provide a summary of the key principles and objectives to build a sustainable home.

When designing your home, take into consideration the items listed on the Check Sheet. If majority of these items are addressed, you will get the best out of your home, making it more liveable and cost-efficient whilst reducing your impact on the environment.

Disclaimer

Definitions

Sustainable Development

A development that meets the needs of the present, without comprising the ability of future generations to meet their own needs.

Ecology

The study of the interconnectedness and interdependence of all living things, including the systems that support them.

Ecologically Sustainable Development (ESD)

A development that does not interfere with the delicate interconnections. ESD protects and conserves the ecological balance whilst maintaining cultural and economic development.

Passive Design

Design or modification of a development to make it more comfortable and reduce energy consumption in all climates by taking advantage of natural heating and cooling methods.

Water Use

How to reduce the water used inside and outside a development through improved water use efficiency, by using rainwater and wastewater and by designing landscaping to need less water.

Energy Use

How to reduce power consumption in a development and take advantage of renewable electricity systems.

Materials Use

The environmental and health impacts of the materials used to build and furnish a development. Choosing "environmentally preferred materials" can reduce harmful health effects, minimise waste, reduce embodied energy consumption and eliminate other off site issues.

Site Issues

How to minimise a developments impact on the chosen site and the impact of the site on the broader environment, as well as how to deal with noise problems.

Other Impacts

Issues such as, streetscape, transport and health and safety.

Check Sheet ☑

Passive Design

- ☐ Design for climate
- ☐ Choosing a site to make the most of its natural attributes
- ☐ Passive solar heating:
  - ○ Northerly orientation of window areas
  - ○ Passive shading of glass
  - ○ Thermal mass for storing heat
  - ○ Minimising heat loss with insulation, draught sealing and advanced glazing
  - ○ Floor plan zoning to get heating to where it is most needed and keep it there
- ☐ Passive cooling:
  - ○ Envelope design for passive cooling
  - ○ Natural cooling sources
  - ○ Hybrid cooling systems
  - ○ Adapting lifestyle
- ☐ Insulation
- ☐ Thermal mass
- ☐ Glazing
- ☐ Shading
- ☐ FirstRate – software for rating passive design

Water Use

- ☐ Reduce water demand
- ☐ 5 Star rated products
- ☐ Rainwater harvesting
- ☐ On-site wastewater reuse
- ☐ Waterless toilets
- ☐ Stormwater management
- ☐ Outdoor water use

Energy Use

- ☐ Conventional electricity
- ☐ Natural gas
- ☐ Space heating
- ☐ Water heating
- ☐ Green Power
- ☐ Renewable electricity systems
- ☐ Electrical appliances – Reach for the Stars
- ☐ Gas appliances – Reach for the Stars
- ☐ Lighting

Material Use

- ☐ Minimise the amount of waste
- ☐ Use materials with least environmental impact
- ☐ Consider both operational and whole lifecycle performance of materials and designs
- ☐ Use fully recycled materials or materials with recycled content
- ☐ Choose materials with a lifespan equivalent to the projected life of the building
- ☐ Design to extend building lifespan (current average 50 years - aim for 100+)
- ☐ Design and build for de-construction, re-use, adaptation, modification and recycling
- ☐ Consider how and where the materials are sourced and the impacts this causes
- ☐ Minimise the energy used to transport materials by using locally produced material
- ☐ Use of lightweight material where appropriate for Occupational Safety and Health issues it also reduces transportation and erection energy
- ☐ Minimise the energy used to heat and cool the building by using materials that effectively modify climate extremes
- ☐ Chemicals used in the manufacture of some materials
- ☐ Minimise or eliminate emissions during use and manufacture

Site Issues

Biodiversity Impacts on Site

- ☐ Choose a site that has been cleared, wherever possible
- ☐ Avoid unnecessary disturbance to vegetation and soil
- ☐ Limit clearing outside the building footprint. Vehicle tracks, workers' carparking and rubbish dumps should be concentrated in one area
- ☐ Retain significant habitat trees
- ☐ Rehabilitate disturbed areas with saved topsoil and salvaged plants
- ☐ Use indigenous (local native) species in the garden
- ☐ Maintain links between adjacent bush and the landscaping

Erosion & Sediment Control

- ☐ Divert uncontaminated water away from the construction site
- ☐ Minimise erosion by minimising site disturbance, stabilising disturbed surfaces and securing material stockpiles
- ☐ Prevent sediment contaminated water leaving the construction site
- ☐ Use diversion devices such as channels and earth banks to divert clean stormwater away from the construction site. This reduces potential for stormwater to become contaminated with sediment
- ☐ Trap suspended sediment using a geotextile filter fabric fence or straw bales. Use barriers to filter coarse sediment at all points where stormwater leaves the construction site
- ☐ Use only a single vehicle access point
- ☐ Cut brick, tile or masonry on a pervious surface such as grass or soil, to prevent sediment reaching drains.
- ☐ Stabilise the site as soon as possible after construction with semi permeable paving, mulch, plants and/or turf

Sustainable Landscaping

- ☐ In dry areas, that were not formerly wetlands, planting low water-use indigenous vegetation greatly reduces water consumption
- ☐ Indoor plants can be used to filter and improve indoor air quality
- ☐ Vegetation can be used for screening, as a windbreak and to frame select views
- ☐ The topography of a garden should ideally reflect the original relief to minimise the impact on drainage patterns but bunds can sometimes be created to enhance visual and/or acoustic privacy

Noise Control

- ☐ Locate quiet rooms as far away from noise sources as possible, without compromising passive solar design principles
- ☐ Install windows away from noise sources, if possible
- ☐ Position noisy areas together and away from quiet areas
- ☐ Avoid placing laundries, bathrooms or living rooms next to, above or below bedrooms without adequate sound insulation
- ☐ Locate driveways/garages away from bedrooms and living rooms
- ☐ Appropriate material selection can reduce noise levels within the development
- ☐ Wall and floor fabric with a high sound reduction index (Rw) Install double glazing or laminated glass to reduce external noise transmission into the home
- ☐ Select proprietary noise reduction carpet underlays
- ☐ Solid core doors in preference to hollow core doors
- ☐ Soundproof plumbing
- ☐ Soft furnishings, drapes and rugs to absorb sound

Other Impacts

Streets and Communities

- ☐ Understand the character of the local neighbourhood and design the development or addition sympathetically
- ☐ Face developments towards streets, parks and open space to improve visual access and security. This needs to be balanced with good orientation for passive heating and cooling
- ☐ Set garages and carports away from the development frontage to minimise their visual impact
- ☐ Limit the width of driveways and use shared driveways where possible
- ☐ Plant trees to enhance the quality of the street
- ☐ Avoid high walls and hedges on the street boundary as they isolate the development from the neighbourhood
- ☐ Respect the neighbours privacy, sunlight and views

Transport

- ☐ Avoid car dependency by choosing an area close to public transport and other services

Health and Safety

- ☐ Round bench edges and corners
- ☐ Eliminate cross-traffic routes through the work triangle (area between stove, sink and refrigerator)
- ☐ Use slip resistant flooring and avoid steps in bathrooms
- ☐ Install fail-safe mixing valves on both the bath and the shower
- ☐ Ensure that privacy locks on bathroom doors can be opened from the outside in the case of an emergency
- ☐ Provide energy efficient outdoor lighting along paths

Adaptable Housing

- ☐ Changing family size
- ☐ Ageing
- ☐ Physical disability
- ☐ Working from home
- ☐ Changing lifestyles

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