



ENVIRONMENTALLY SUSTAINABLE DESIGN (ESD)

In our changing climate and increasingly resource-constrained world it has become imperative that building design incorporate elements to create more sustainable development and minimise negative impacts on society and the environment.

Environmentally sustainable design is most cost effective to achieve when its principles are applied from the very beginning of a project. Major environmental performance benefits flow from considered orientation, layout and choice of construction materials. Getting these right at the beginning of the design phase will save time and money during construction as fewer expensive add-ons will be required to achieve performance targets.

When is a planning application required to demonstrate environmentally sustainable design?

The City's Policy No. 7.1.1 – Built Form (Built Form Policy) states that development applications for commercial and multiple dwelling developments within the City of Vincent must demonstrate that environmentally sustainable design would be achieved.

Although not required, single houses and grouped dwelling development are strongly encouraged to adopt sustainable design principles.

How do I demonstrate that my development application achieves environmentally sustainable design?

The proposed development must demonstrate that:

- It maximises passive solar heating, cooling, natural ventilation and light penetration to reduce energy consumption;
- It is capable of recovery and re-use of rainwater, storm water, grey water and/or black water for non-potable water applications;
- Climate moderation devices can be incorporated to reduce passive solar gain in summer and increase passive solar gain in winter; and
- It is capable of achieving one of the environmental performance ratings shown in the below table, or their equivalent*.

Accepted Rating Frameworks	Specifications / compliance requirements	Minimum requirement to be achieved
Green Building Council of Australia's Green Star rating system	Current Design and As-Built rating tool	5 star Green Star rating
or		
Life Cycle Assessment Methodologies	ISO 14044 "Environmental management – Life cycle assessment – Requirements and Guidelines" and EN15978 "Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method."	Residential component: - Global warming potential of the development over its lifetime to be reduced by 50% or more when compared to the average Australian code-compliant equivalent building built at the same time. - Water use of the development over its lifetime to be reduced by 25% or more when compared to the average Australian code-compliant equivalent



		building built at the same time. Commercial component: - Global warming potential of the development over its lifetime to be reduced by 30% or more when compared to the average Australian code-compliant equivalent building built at the same time. - Water use of the development over its lifetime to be reduced by 15% or more when compared to the average Australian code-compliant equivalent building built at the same time
Or equivalent*		

Preliminary Sustainable Design Assessment Report using the Green Star ‘Design and As-built’ rating tool

This is a self-assessment and does not require certification from the Green Building Council of Australia (GBCA) however, it must be prepared by a Green Star Accredited Professional. The report must include the following:

- A description of the sustainability strategies and initiatives that will be targeted by the development;
- A Green Star Score Card showing the number of points that can be achieved by the targeted strategies and initiatives;
- Confirmation that all targeted strategies and initiatives have been integrated into the project design documentation submitted with the development application; and
- A statement confirming the Applicant's intent to retain sufficient sustainability strategies and initiatives to the working drawing stage to ensure that the final design is capable of achieving a 5 star Green Star rating.

Target Setting Report using life cycle assessment (LCA) methodology

A ‘LCA Report’ or ‘Target Setting Report’ can be prepared by any person provided that it demonstrates compliance with the standards referred to in the table above. The report must include the following:

- The lifetime savings targets of both global warming potential and net fresh water that the development is able to achieve;
- Describing and quantifying the global warming and water impacts of the preferred strategies for achieving these targets;
- Listing a range of reserve strategies that will be employed to achieve each target should preferred strategies become unfeasible as the design is finalised; and
- A statement confirming the Applicant's intent to retain sufficient sustainability strategies and initiatives to the working drawing stage to ensure that the final design is capable of achieving the global warming and water benchmarks set out in the City's Built Form Policy.

Environmentally Sustainable Design Guide for Developers

Outlined below are a number of design elements that can be incorporated in a proposal to produce a higher level of environmental sustainability:

Carbon emissions reduction:

Building materials

- Construction materials with renewable/recycled/recyclable content.
- Wood is certified as plantation grown and sustainable.



- Fitout materials require minimal maintenance, have long life-spans and can be recycled at end of life. Where possible, they are designed for disassembly and repair.
- Light coloured roof and external wall colours to reduce heat island effect.
- External shading/cladding to limit heat absorption.
- Low emissivity glass in windows to minimise unwanted heat loss/gain.
- Appropriate use of thermal mass to maximise winter heat gain and maximise summer cooling.

Building orientation and layout

- Indoor and outdoor living and entertainment areas facing north where possible, to maximise use of natural light and winter sun for passive heating.
- Internal atrium to provide northern light to units on south side of building and improved cross ventilation to all units.
- Rooms with lower heating and lighting requirements (laundries, bathrooms, bedrooms facing south).
- Living areas can be closed off from other areas to reduce the need for heating and cooling.
- Accessibility and adaptability are built in to minimise the need for remodelling and retrofitting to accommodate the diverse needs of occupants over time.
- Indoor or outdoor area/s provided for clothes drying.
- Landscaping integrated with the building design to maximise passive heating, cooling, natural light and cross ventilation; and minimise heat island effect.
- Roof space kept clear of plant and equipment to maximise space for solar PV.

Windows

- Most glazing facing north, limited glazing facing south, east and west.
- External shading devices to block summer sun entering the building.

Insulation

- Air tight building envelope.
- Thermal insulation in roof, walls and exposed floors.

Ventilation

- Openable windows located to allow natural cross-ventilation.
- Openable internal vents to allow air movement between rooms when doors are closed.
- Dual rotation ceiling fans in living areas and bedrooms.
- Specialised cabinetry designed to provide adequate ventilation for refrigerator to run at maximum efficiency.
- Dedicated kitchen exhaust hoods ducted to outside, with variable supply of make-up air.

Energy (efficiency and generation)

- Solar PV system to power common use items (lighting, pool pumps, elevators).
- Solar PV for individual properties within the development.
- Solar thermal or heat pump system for water heating or pre-heating.
- High efficiency motors and/or regenerative and variable speed drives on mechanical equipment (e.g. elevators, air conditioning, car park ventilation).
- HVAC systems use high efficiency refrigerant gases, air source heat pumps and/or ground source heating/cooling for improved energy efficiency.
- Air conditioning limited to living areas or zoned to allow individual room control.
- High efficiency ovens, cook tops and dishwashers.
- Energy monitoring to individual units, preferably with real-time data available to occupants via a user-friendly platform to allow occupants easy monitoring of their own energy use.
- Sub-metering of all significant base building energy uses (pumps, motors, common HVAC and lighting).
- Refrigerator space minimised to cater for the smallest refrigerator considered adequate for the maximum number of dwelling occupants.
- Energy efficient lighting (LED).
- Lighting controlled by timers, motion sensors or light sensors as appropriate, particularly in common use areas (car parks, entryways, stair wells).



- Underground car park ventilation engineered to maximise air flow efficiency and controlled by exhaust gas sensors.
- Provision of minimum parking spaces and design to encourage low emission vehicles, including electric vehicle recharge points.
- In commercial buildings, provision of generous cycling facilities including bike storage, change rooms, showers etc.

Water Savings:

Landscaping

- Waterwise plants.
- Waterwise irrigation system (drip irrigation, soil moisture sensor, automated controller).

Fit-for-purpose water use

- Rain water capture, storage and reuse (e.g. for toilet/laundry).
- Stormwater capture, storage and infiltration (e.g. via detention features such as rain gardens).
- Greywater/blackwater treatment and reuse for irrigation.

Plumbing

- Bathrooms, laundry and kitchen located close to the hot water system to minimise wastage of cold water from pipes.
- Hot water supply pipes are insulated.
- Where a single centralised hot water system supplies multiple units, an insulated pipe continuously circulates hot water to all apartments, or instantaneous gas boosters are provided to individual units.
- Water-efficient fixtures with the highest WELS rating available.
- Water monitoring to individual units, preferably with real-time data available to occupants via a user-friendly platform to allow occupants to easily monitor their own water consumption.
- Recovery and reuse of fire system test water.

Resource conservation:

Construction and demolition waste

- Preservation and incorporation of existing buildings on site (or parts thereof) in the new development.
- Recycling or reuse of waste generated during demolition and construction aim for 90% or more to be diverted from landfill (e.g. brick and concrete rubble reused in gabion walls onsite, other materials recycled through a documented pathway).

Do you have more questions?

The City is unable to confirm if a proposal will be supported in the absence of a formal development applications. However, applicants can discuss planning proposals and preliminary plans with the City's Urban Planners. Urban Planners can provide general advice to applicants on a proposed development or land use and the information required to lodge a complete application.

A Duty Planner is available to talk to at the City's Administration Office Monday to Friday, 8.30am to 5.00pm, in person or on the phone.

Phone: **9273 6000**

Email: mail@vincent.wa.gov.au

Address: **Main Administration Building, 244 Vincent Street, Leederville 6007, WA**

Disclaimer: *This information is produced by the City of Vincent in good faith and the City accepts no responsibility for any ramifications or repercussions for providing this information. Verification with the original Local Laws, planning schemes and other relevant documents is recommended for detailed references.*