2.15 ENVIRONMENTAL DESIGN POLICY – RESIDENTIAL

(ADOPTED 25 OCTOBER 2010)

1. INTRODUCTION

Sustainability as a practice has emerged over the last 25 years as a result of recognition worldwide that unchecked human activity is having detrimental impact on the Earth's natural carrying capacity and that the Earth's resources are limited and therefore need to be preserved. Sustainability also aims to address global and local social issues predominantly through a more equitable distribution of natural and economic resources.

It is commonly understood that sustainability is about meeting the needs of the present without compromising the ability for future generations to meet their own needs. This policy seeks to encourage the incorporation of appropriate environmentally sustainable design standards which respects the existing residential character of the area.

In recent years, the near universal acceptance that accelerated global warming is a human induced phenomenon has precipitated a focus on new environmental policies and regulation to improve standards across a range of market sectors and their activities.

The City of Subiaco is proactive in its own approach to sustainable planning and design and is committed to the incorporation of environmentally sustainable design standards. As part of this commitment the City has developed this Residential Environmental Design Policy which has the purpose of providing guidance on the principles of energy efficient building design and encouraging the use of environmental design features in residential dwellings.

2. OBJECTIVES

The overall objective of the policy is to encourage the incorporation of environmental design principles as standard practices in residential development.

This will be achieved by:

2.1 Providing guidance on the principles of energy efficient building design;
2.2 Highlighting the environmental, economic and social benefits associated with sustainable building design;
2.3 Encouraging the use of environmental design features in the construction of new residential dwellings and alterations and additions of existing residential developments within the City; and
2.4 Ensuring that design for good environmental performance is considered in conjunction with other design and amenity considerations in the Subiaco context.

3. DEFINITIONS

The following terms are used in this policy:

3.1 Additions and alterations: Additions and alterations to existing dwellings within the City.

3.2 Building Thermal Performance; The passive ability of a dwelling to maintain stable indoor temperatures. In other words the home's ability to stay naturally cool in summer and warm in winter.

3.3 Fixtures, fittings and appliances: Energy and water efficient fixtures, fittings and appliances for homes including water efficient taps, showers, dual-flush toilets, fans and tinted windows.

3.4 Greywater system: Wastewater from the laundry and bathroom commonly re-used for garden irrigation. Greywater systems require a minimum of $50m^2$ of irrigable land to be located on the

subject lot and are subject to Department of Health design standards. Greywater excludes toilet and kitchen wastewater.

3.5 Habitable room: As per Residential Design Codes definition.

3.6 Insulation: Roofing material that prevents or reduces the transfer of heat into the home.

3.7 Living Area Orientation: The orientation and location of daytime living areas to take advantage of natural winter solar heating and lighting whilst reducing impacts of summer heat. In other words design to allow the sun's heat into the home in winter while excluding it during the long hot days of summer.

3.8 Major opening: As per Residential Design Codes definition.

3.9 New dwellings: New development of a vacant site, or when existing development is to be entirely demolished prior to construction.

3.10 Photovoltaic systems: Generally composed of solar panels that convert solar radiation into direct current electrical energy.

3.11 Plumbed rain water tanks: A water tank used to collect and store rain water runoff, typically from roof surfaces via gutters and downpipes. Tanks are connected to non-potable water outlets in the home such as toilet and laundry via a pump. Plumbing standards ensure no rainwater enters potable water supply mains.

3.12 Roofing: Materials used in building a roof.

3.13 Solar water heaters: A system designed for domestic purposes that collects solar radiation for heating water. Solar water heaters have a storage tank and are fitted with a booster for supplementary heating.

3.14 Waterwise irrigation: An irrigation system comprising efficient trickle drippers and sprays or sub-mulch irrigation, automated controllers and rain sensor devices that efficiently monitor and manage the irrigation of garden areas.

3.15 Waterwise landscaping: Use of waterwise plants (native or low water use exotic species), hydrozoning to customise irrigation for different areas of vegetation, and the use of soil improvers and mulch to prevent water evaporation.

4. POLICY APPLICATION – CITY WIDE

This policy applies to all new residential dwellings and existing residential dwellings undertaking alterations and additions within the City of Subiaco. The following core principles apply:

a) The applicant is required to complete the attached residential environmental design policy checklist (Schedule 2) with the lodgment of any residential development application for a new dwelling or to an existing dwelling with undertaking alterations and additions.
b) Plans lodged for development approval with the City shall include the location, size, colour and any other relevant detail for external environmental design features which may impact the amenity of adjoining properties.
c) External environmental design features should be designed as integrated features of the dwelling with respect for the amenity of the locality.

5. STANDARDS

5.1 Environmental Design Features

All new dwellings and substantial additions and alterations to existing dwellings are encouraged to incorporate the following environmental design features:

5.1.1 **Plumbed Rainwater tanks:** A 2500 litre capacity rainwater tank and pump for use restricted to toilet flushing, cold water laundry use and as a supplement for garden irrigation and hot water heating is suggested.

Plans lodged for development approval with the City must include the location, size and colour of the rainwater tank, pump and associated devices/units. The tank shall be selected and/or designed as an integral feature of the proposed building works and if visible from the primary street the tank, pump and associated devices shall be considered at the discretion of the City. Roof mounted tanks are not permitted.

5.1.2 **Solar water heaters:** Solar water systems should be selected and installed as an integral feature of the roof and if possible so they are not visible from the primary street. The plans lodged for development approval with the City must show the size and location of the solar water heater and booster.

5.1.3 **Photovoltaic (PV) renewable energy system:** A grid interactive photovoltaic (PV) system to a minimum size of 1.5kW. Where visible from the primary street, the system shall be selected and installed as an integral feature of the roof. The plans lodged for development approval with the City shall include the location and size of the PV array to ensure compliance with the above.

5.1.4 **Living area orientation:** Lots on a predominantly North South axis having one main living area (for example a lounge, dining or kitchen) with at least one major opening facing north to increase solar heat gain and natural lighting in winter.

For all other lots: at least two main living areas (for example a lounge, dining or kitchen) and at least one major opening shall be located to face north to increase solar heat gain and natural lighting in winter. Major openings should be minimised where they are east or west facing.

5.1.5 **Building Thermal Performance:** The thermal performance of the dwelling to achieve a minimum 6-star AccuRate rating of the Building Code of Australia.

5.1.6 **Waterwise Landscaping:** The use of waterwise plants (natives or low water use exotics), that, once established, will flourish on one watering day a week or less during summer. A list of suitable local native species for the Karrakatta soil type of the region can be found at www.subiaco.wa.gov.au.

Alternatively, a comprehensive list of over 500 Waterwise plants for Perth officially endorsed by the National Smart Approved WaterMark Scheme can be found at Water Corporation Being Waterwise: http://www.watercorporation.com.au.

Plants should be consolidated in defined areas to allow watering efficiency and areas of lawn kept to a minimum. The water retention ability of the top 15-20 cm of soil in garden beds may be improved by adding organic matter, such as animal manures and bagged soil improvers.

5.1.7 **Waterwise Irrigation:** An irrigation system comprising efficient trickle drippers and sprays or sub-mulch irrigation, automated controllers and rain sensor devices that efficiently monitor and manage the irrigation of garden areas.

A plan outlining the proposed waterwise landscaping plan from an endorsed Water Corporation Garden Irrigator expert should be provided to the City at the time of

lodgement for Development Approval. Information on Waterwise Irrigation and Waterwise Irrigators can be found at Water Corporation Being Waterwise: http://www.watercorporation.com.au

5.1.8 **Retention of Trees**: Wherever possible and practical, significant individual trees should be preserved on private lots. The space for trees within the City diminishes as urban development occurs and residential densities increase. Trees add value to property and contribute significantly to the amenity of the City, providing shade, shelter from wind, habitat for wildlife, and filter for air pollution and traffic noise. Deciduous trees are particularly desirable and should be considered when planting new tress.

5.1.9 **Greywater system:** Connection of bathroom and laundry wastewater to a greywater system irrigating a minimum of 50m^2 of land located on the subject lot. A plan outlining the proposed approved greywater system, plumbing layout, irrigation lines and setback distances should be incorporated in submitted plans for Development Approval.

Information on approved Greywater systems can be found at WA Department of Health: http://www.public.health.wa.gov.au/3/667/2/greywater.pm

5.1.10 **Fixtures, fittings and appliances:** Incorporation of flow regulators to kitchen and bathroom taps and shower heads are recommended as are dual flush toilet systems. Energy efficient appliances such as dishwasher's and washing machines significantly reduce energy and water consumption.

Window tinting, adjustable shading and roof overhangs are effective solutions for protecting the home from direct sun while installing fans in large rooms will enhance cooling in these areas and reduce air conditioning use over summer.

Information regarding the incorporation of energy efficient fixtures, fittings and appliances can be located at Water Corporation Being Waterwise: http://www.watercorporation.com.au.

5.1.11 **Insulation:** Insulation can significantly reduce the amount of heat entering the home. It can also help seal the cool air created by air conditioning.

There are several types of roofing insulation. Bulk insulation such as wool, bubble wrap and fibreglass reduce the amount of heat entering the home by resisting the amount of 'conducted' and 'convected' heat flow between the hotter air space in the roof and the cooler air inside the house. Reflective insulation such as reflective foil sheeting, multi-cell sheeting and expandable concertina sheeting reflect heat away from a surface therefore preventing the penetration of radiant heat that would otherwise enter a home from the roof.

5.1.12 **Roofing:** Light roof colours reflect heat, preventing surfaces from becoming excessively hot while dark roofs colours absorb heat which is then transferred into the home.

Choosing light roof colours such as cream, light beige and light greys is one of the cheapest and easiest ways to reduce the amount of heat entering the home. Roof colours to avoid include black, dark blues, dark greens, dark greys, reds and weathered or rusting galvanised surfaces which can get nearly as hot as a black roof.

Roofs should be ventilated to enable the roof space to renew the air compressed in the roof space transferring down through the ceiling and into the home. Ventilation of roof spaces can be done by installing rotating roof vents, solar powered roof ventilators, roof vents, gabled vents and unsealed eaves.

SCHEDULE 1

CHECKLIST

Under the *Residential Environmental Design Policy,* the City encourages the integration of environmentally sustainable design principles into the construction of all new buildings and redevelopments within the City of Subiaco.

This Checklist should be completed once the applicant has read the Residential Environmental Design Policy and must be submitted with the planning application for all development for new dwellings and alterations and additions.

Please tick the boxes that are applicable to your development.

Environmental Design Feature	**Yes**	**No**
Plumbed rainwater tank:	❑	❑
Solar water heater:	❑	❑
Photovoltaic (PV) renewable energy system:	❑	❑
Living area orientation:	❑	❑
Building thermal performance:	❑	❑
Waterwise landscaping:	❑	❑
Waterwise irrigation:	❑	❑
Retention of trees:	❑	❑
Greywater system:	❑	❑
Water flow regulators:	❑	❑
Window tinting, adjustable shading, fans:	❑	❑
Energy efficient appliances:	❑	❑
Roof insulation:	❑	❑
Light coloured roofing:	❑	❑
Roof ventilation:	❑	❑

Address of Property: _____
Applicant Full Name: _____
Applicant's Signature: _____

SCHEDULE 2

AVAILABLE REBATES

Rebates are available for various energy efficiency and water conservation improvements from the Australian Government, visit http://www.environment.gov.au. Current applicable rebates to this policy include rebates for ceiling insulation, solar hot water systems and rain water or greywater systems.

In addition, the City of Subiaco offers a rebate on the application fees for the installation of a greywater system.

REFERENCES

Plumbed Rainwater Tanks:

- Your Home Technical Manual http://www.yourhome.gov.au/technical/fs71.html
- Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/sustainability/energyefficiency/index.html

Solar Water heating:

- Sustainability Energy Development Office – Smart Homes: http://www.sedo.wa.gov.au/pages/solar_hot.asp
- Your Home Technical Manual: http://www.yourhome.gov.au/technical/fs65.html#solar
- Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/sustainability/energyefficiency/index.html

Photovoltaic Systems:

- Your Home Technical Manual: http://www.yourhome.gov.au/technical/fs67.html
- Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/sustainability/energyefficiency/index.html

Waterwise irrigation and landscaping:

- Water Corporation Being Waterwise: http://www.watercorporation.com.au

Greywater systems:

WA Department of Health Greywater systems:

- http://www.public.health.wa.gov.au/3/667/2/greywater_.pm
- Your Home Technical Manual: http://www.yourhome.gov.au/technical/fs71.html#wastewater
- Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/sustainability/energyefficiency/index.html

Building Thermal Performance:

- Sustainability Energy Development Office – Smart Homes – House Energy Rating Tools: http://www.sedo.wa.gov.au/pages/her_tools.asp
- Your Home Technical Manual: http://www.yourhome.gov.au/technical/fs41.html
- Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/sustainability/energyefficiency/index.html