City of Cockburn

Environmentally Sustainable Design (ESD) Requirements

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This document provides guidance for City of Cockburn staff and contractors to incorporate Environmentally Sustainable Design (ESD) principles into Council facilities at all stages of design, construction, operation and maintenance.

Policy requirements

The City of Cockburn Sustainability Policy outlines 11 principles which apply across all of the City's operations. The following principle outlines a requirement for innovative ESD in all new facilities.

> ***(5) Environmentally Sustainable Design (ESD)***
>
> *Council will design, build and operate all community facilities and civic infrastructure in a sustainable manner. All new Council facilities exceeding a budget of $1 million will set aside a minimum of three percent (3%) of the total project cost for innovative ESD initiatives.*

ESD definition and objectives

Environmentally Sustainable Design is an integrated, holistic approach that seeks to reduce negative impacts on the environment and the health and comfort of building occupants, whilst improving performance and reducing operating costs.

The purpose of Environmentally Sustainable Design is to encourage decisions at each phase of the design process that will positively impact the design, construction, operation and decommission of civic infrastructure.

The objectives of ESD are to:

- reduce operational costs
- improve energy performance and reduce peak demand
- reduce reliance on non-renewable energy
- improve water efficiency
- provide a healthy indoor environment
- promote sustainable transport
- demonstrate responsible waste management and material reuse
- create a sense of place with a strong connection to community and culture
- contribute to the urban forest and enhance the natural environment
- demonstrate leadership by adopting and promoting sustainable design.

ESD requirements for Project Managers

Project managers must reserve 3% of the total project cost for ESD initiatives over and above standard practise. This is additional to the 1% spend on public art as specified in the City's Local Planning Policy LPP5.13 Percent for Art.

The ESD response will be different for each project depending on its purpose, place, community and culture. ESD principles should be considered early in project planning and applied during initial design stages.

All projects should aim to improve energy performance and reduce ongoing operational costs. Occupied community facilities should include an appropriately sized renewable energy system to match the daytime electricity consumption.

Iconic and landmark facilities must demonstrate leadership and promote innovative ESD. They should demonstrate a strong connection to community, culture and create a sense of place.

Integrated monitoring systems must be compatible with the City's sustainability reporting platform.

Formal ESD rating tools and scorecards can be used to track the ESD principles adopted in the design but are not mandatory.

ESD consultants may be engaged during the project to provide guidance and advice, develop ESD design options and cost estimates, coordinate with other design consultants to determine feasibility, provide data and confirm that ESD requirements have been met at practical completion.

ESD requirements for procurement

All respondents when submitting a response to tenders must clearly demonstrate their experience in the application of sustainable building design principles.

Respondents must provide examples of current or past projects that showcase innovative ESD. Respondents should provide sufficient detail to outline the degree of their experience and how this will be applied to the key deliverables outlined in the request.

Respondents must consider the ESD requirements (over page) and specify the degree to which each principle will be included or excluded within the design and construct of the proposed project, and the rationale for their response. Respondents must also provide details of any ESD accreditations or other supporting information.

Environmentally Sustainable Design (ESD) Principles

ESD Initiatives	Included (Yes/No)	Comments, limitations, alternatives proposed
Passive design		
Northerly orientation of living/working areas with large windows for natural light. Minimal windows to the east and west to avoid heat gain		
Passive shading of glass and advanced glazing solutions		
Sufficient thermal mass in building materials for absorbing and storing heat energy		
Advanced insulation and draught sealing to maintain a comfortable temperature		
Design for natural light and ventilation, appropriate use of skylights, window openings, roof cavity ventilation etc		
Light coloured roof and walls		
Energy and peak demand		
Renewable energy technologies (e.g. photovoltaic cells, wind generator system, geothermal heating, battery storage and/or battery ready). Off grid systems and/or microgrids (where suitable)		
Low energy technologies (e.g. energy efficient LED lighting and sensors, energy efficient heating and cooling, solar hot water systems, electric heat pumps, appliances with 5-6 star Energy Rating Labels etc)		
Reductions of energy peak demand through design measures (e.g. appropriate building orientation, shading to glazed surfaces, solar panels or battery storage)		
Floor plan zoning based on water and heating needs and the supply of hot water		
Responsible materials		
Use of sustainable materials that are: • recycled (e.g. recycled timber, bricks, metal) • rapidly renewable (e.g. bamboo, cork, straw bale) • recyclable (e.g. timber, glass) • accredited with an eco label (e.g. Forest Stewardship Council FSC)		
Life cycle analysis, use of low carbon building materials with low embodied energy (e.g. mud brick, rammed earth, straw bale), closed loop production		

ESD Initiatives	Included (Yes/No)	Comments, limitations, alternatives proposed
Urban ecology		
Retention of existing vegetation, natural landforms and topography		
Design for ecological considerations including • fauna habitat • links to parks, reserves and bushland • Impact on hydrology flow and water discharge • Use of endemic, native and water wise vegetation in landscaping		
Application of biophilic design principles to connect building occupants with nature to improve physical and mental wellbeing (e.g. green walls and roofs, use of indoor plants and natural materials, atriums, large windows or glass walls with natural views)		
Retention of significant trees and installation of additional trees to increase urban forest tree canopy cover or offsite restoration		
Provision of productive food gardens		
Water efficiency		
Use of alternate water supplies and water reuse systems (e.g. greywater system, rainwater tanks)		
Water efficient appliances, fittings and fixtures with high WELs ratings (Water Efficiency Labelling and Standards scheme) e.g. dual-flush toilets, cisterns with greywater integrated basins, 5-6 star WELs taps, showers, irrigation, etc.		
Integrated urban water management to enhance water quality and utilise runoff (i.e. improvements to stormwater quality, limit site discharge with stormwater capture and reuse, use of permeable surfaces, designs to mitigate flood risk)		
Climate change resilience		
Building designed to withstand future climate change risks e.g. • additional trees and external shading to mitigate hotter summers and heatwaves • higher floor levels and increased setbacks to accommodate sea-level rise or flooding risks • back-up power for emergency management • rainwater tanks, greywater systems and waterwise landscaping to adapt to lower rainfall etc • design to withstand increased storm intensity		

ESD Initiatives	Included (Yes/No)	Comments, limitations, alternatives proposed
Healthy indoor environment		
Use of non-toxic and Zero VOC products (e.g. paints, adhesives, carpet, sealants, furniture)		
Provision of fresh air intake, cross ventilation and natural daylight to achieve thermal comfort levels with minimised need for mechanical heating, ventilation and cooling		
Design to minimise noise levels and noise transfer		
Good work design to support the physical, emotional and mental needs of building occupants		
Waste management		
Minimisation of waste during demolition, recycling and retention of existing materials (if applicable)		
Responsible construction practices to avoid, reuse and recycle waste onsite and prevent litter.		
Design to encourage long building life and easy adaptation to future new uses		
Building designed with appropriate separation, storage and collection space for waste and recycling		
Sustainable transport		
Provision of safe, shaded and accessible connections to public transport, neighbouring footpaths, facilities and open space		
Provision of advanced end-of-trip facilities and bicycle parking		
Provision of EV charging stations, car share scheme		
Connection to community and culture		
Inclusion of local artists and community groups		
Crime Prevention Through Environmental Design (CPTED) principles applied		
Universal accessibility and inclusion		
Consideration of culture and heritage		
Engagement of local indigenous community		
Aesthetics, amenity and contribution to place		

ESD Initiatives	Included (Yes/No)	Comments, limitations, alternatives proposed
Innovation and new technology		
Exceptional performance, leadership in sustainability, innovative solutions or new technology (e.g. Carbon positive buildings, micro-grids, hydrogen storage, passive house, smart precincts, etc)		
Sustainable car park design		
Use of recycled materials wherever possible eg reconstituted asphalt pavement for car park surface, use of recycled aggregates in footpaths/concrete works, recycled sand in sub-base and lower layers		
Car park levels and kerbing are designed to direct stormwater into tree pits / swales / drainage structures		
Minimum of 1 tree per 4 car bays		
Provision of EV charging stations, motorbike and bicycle parking		
Smart building management		
Smart building management systems to ensure optimal efficiency and reduced operating costs		
Advanced real-time energy, water and solar PV tracking compatible with integrated monitoring systems		
Automation systems that improve the efficiency of a building e.g. smart lighting, appliances and shading structures that regulate to suit environmental conditions and avoid energy peaks		
Sustainability related information transferred to owners and tenants at handover		
Performance contracts and/or third part audits of ESD infrastructure to guarantee quoted savings		
Environmentally Sustainable Design (ESD) ratings and accreditations e.g. • Green Star • NABERS • Enviro Development certification • One Planet Living endorsement • Living Building Challenge		

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