

Darebin ESD Building Policy

Sustainable Design for Council Buildings

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Darebin ESD Requirements

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1.1 Introduction

The purpose of this document is to facilitate the delivery Environmentally Sustainable Development (ESD) into all building design and construction projects, major refurbishments and building maintenance works at Darebin City Council.

Darebin is responsible for over 400 buildings and structures which are used by staff and community members. There is a continual need for upgrades and new buildings and the policy provides the opportunity to show that Darebin is committed to: ESD, eliminating our carbon footprint, reducing water use, pollution and waste, plus a range of other sustainable initiatives.

This document outlines Council's environmental goals and the responsibilities of project stakeholders in meeting those goals. The requirements of this document should be considered as early as possible in the project development to ensure that adequate funds are included in the budget.

1.2 Context and Key Council strategies

Sustainable development and addressing climate emergency are key goals proposed in the City of Darebin Council Plan (2017-2022). Council's Municipal Strategic Statement (MSS) sets the future direction for Council's decision making about land use planning and includes sustainability and natural environment as key elements, noting that sustainability is an overriding aim of Council's planning policies.

Council's Asset Management Policy 2017 states that Council will develop and implement environmentally sustainable asset management practices. Through the Asset Management Strategy 2015 – 2019 and Asset Management Plans Council will invest and manage assets consistent with this Policy.

Since 2009 Darebin has been part of the Sustainable Design Assessment in the Planning Process (SDAPP). This involves requesting planning applicants to provide a Sustainable Management Plan (SMP) for developments of 1000sq.m/ 15 or more units or a Sustainable Design Assessment (SDA) for developments of 100sq.m to 5 to 15 units. In general the reports utilise the Built Environment Sustainable Scorecard (BESS) tool and STORM or MUSIC tools for stormwater. The Ten Key Sustainable Building categories must also be addressed and include:

1. Indoor Environment Quality
2. Energy Efficiency
3. Water Efficiency
4. Stormwater Management
5. Building Materials
6. Transport
7. Waste Management
8. Urban Ecology
9. Innovation
10. Construction and Building Management

The improved outcomes in developments for daylight, ventilation, water, etc. have been substantial since the implementation of this process.

The *Darebin Environment Policy* states that Darebin Council will aim for its own operations to be ecologically, socially and economically sustainable and that it will promote sustainability within the Darebin community and further afield.

Environmental targets and management actions are developed in the following key Darebin strategies:

- Climate Emergency Plan 2017 - 2022
- Waste and Litter Strategy 2015-2025
- Watershed: Towards a Water Sensitive Darebin Whole of Water Cycle Management Strategy 2015-2025
- Environmental Purchasing Code;
- Natural Heritage Strategy 2015 - 2025
- Transport Strategy (and components);
- Open Space Strategy.
- Green Business Attraction Strategy (2012 – 2017)
- Green Streets Streetscape Strategy (2012 – 2020)
- Heatwave Strategy
- Urban Forest Strategy (2013 – 2028)
- Darebin Public Toilet Strategy

This policy is an opportunity for the council to further demonstrate the benefits of ESD through leading by example and to lead the way to even higher levels of sustainable buildings.

1.3 Objectives and Benefits

Darebin Council wants to demonstrate best practice and the objectives of this policy are:

- To meet environmental goals and targets.
- To demonstrate corporate responsibility and leadership to the community
- To reduce annual operating costs by consuming less energy and water and generating fewer emissions.
- Future proofing councils assets against climate change and rising costs of utilities
- Ensuring healthy indoor environments and improved comfort levels which can lead to increased occupant productivity and reduced absenteeism.
- To reduce water use and achieve best practice stormwater outcomes.
- To ensure waste avoidance, reuse and recycling during demolition and construction.

While the Building Code of Australia has existing energy and water conservation measures in place they are minimum requirements to eliminate worst practice. The BCA also doesn't cover many aspects of sustainable design such as materials and stormwater pollution.

ESD techniques and practices are constantly changing and current best practices have advanced considerably in recent years. A 2013 study by the Green Building Council (GBCA) titled 'The value of Green Star: A decade of environmental benefits of 428 Green Star certified projects compared to standard minimum practice benchmarks' estimates that they achieve:

- 66% less electricity than average Australian buildings
- Produce 62% fewer Greenhouse gas emissions than average Australian buildings.
- Use 51% less potable water than average buildings
- Recycled 96% of their construction and demolition waste compared to 58% for an average building

Benefits for employers and employees include:

- An average of 2.88 fewer sick days
- Boost in office worker productivity by 15%

1.4 Managing Costs of Green Buildings

Different building project types vary in what level of sustainability can be achieved. As ESD is to be discussed at the Project Initiation Document (PID) phase as part of the Project Management Framework there will be time to scope out what ESD objectives could be incorporated and a suitable budget allocated. This will assist in ensuring that best practice sustainability objectives are achieved.

There are many trends that are making ESD easier to achieve/justify due to a range of factors. These include:

- Energy and water prices increasing faster than inflation;
- Lowering of capital cost of ESD technologies such as solar photo voltaic panels, battery storage and water tanks.
- Increases in competition making ESD products and services more mainstream and affordable.
- Aging and outdated energy infrastructure that is costing too much to operate.
- Greater expectations from the community to design and build sustainable buildings.

Many aspects of good ESD design, such as designing compact buildings with good solar orientation and improved insulation, will have minimal or even positive capital and operational cost implications.

Research undertaken by the Green Building Council of Australia (GBCA) in 2016 of Green Star rated buildings revealed that Green Star projects can be delivered for less than 1% of the overall project budget. On average developers/ building owners are spending an additional:

- 1.5% to achieve 4 Stars at average \$3,020 per square metre
- 2.7% to achieve a 5 stars at \$3,536 per square metre
- 3.2% to achieve 6 stars at \$4,588 per square metre

Initial investment in ESD will be returned through cost savings from building operation, management, the reduction in greenhouse gas emissions and stormwater pollution. Green Star case studies have shown the following savings:

Melton Library and learning Hub – Melton City Council (VIC) achieved a 5 Star Green Star – Public Building Design and As Built Rating. The project has achieved annual utility cost savings of \$23,700 for gas and \$5,000 for water compared to non-Green Star buildings.

Council Administration Building – Wollongong City Council (NSW) achieved a Green star Performance rating. A range of initiatives were implemented that have reduced energy consumption by 54.6% and water by 85%.¹

Based on the above factors Darebin Council will incorporate a 4% contingency (ESD budget) additional to the capital project cost to ensure ESD requirements are adequately accounted for at the concept and planning stage. As part of the Project Management Framework (see Appendix A) ESD will be discussed and signed off at the Project Initiation Document (PID) stage, and during this process the percentage may be lowered or raised depending on the range of ESD initiatives that can be practically incorporated into the project. Please note that for smaller and plant specific projects (such as HVAC upgrades) the percentage will need to be increased. For larger buildings of \$10 million onwards that require a Green Star rating, the ESD budget and ESD initiatives must be established at the PID stage before the project can continue.

The ESD budget will not be used for standard project compliance with the Building code or energy efficiency requirements of the National Construction Code (NCC). This will be ensured by establishing ESD gateways into the Project Management Framework.

1.5 Project Management Framework and ESD gateways

To ensure ESD is incorporated into capital works and major projects, phase gates will be set into the Project Management Framework. The PID stage will establish what ESD strategies and technologies will be incorporated into the project and allocate a suitable budget. A SMP/SDA or checklist of the ESD Minimum requirements will be discussed with the ESD Officer and other relevant stakeholders at the PID stage and then checked throughout the project. This will be provided to the Project manager. Further information is available in Appendix A on page 20.

1.6 ESD rating tools

The following rating tools have been incorporated into this policy.

Built Environment Sustainability Scorecard (BESS)

BESS is an assessment tool created by local governments in Victoria. It demonstrates how a proposed development incorporates sustainable design at the planning permit stage. It is easy to use and free of charge to applicants. It can assess residential, non-residential and mixed use developments. Darebin has expected planning applicants of 5 or more units or 100sq.m plus for non-residential, to use the BESS tool since 2016 and prior to this, the STEPS and SDS tools since 2007. It measures and assesses ESD in nine categories; Management, Energy, Water, Stormwater, IEQ, Transport, Waste, Urban Ecology, Innovation. <http://www.bess.net.au/>

¹ <http://new.gbca.org.au/showcase/projects/wollongong-city-council-administration-building/>

Green Star

Green Star is a voluntary sustainability rating system for buildings in Australia. It was launched in 2003 by the **Green Building Council of Australia (GBCA)**. The **Green Star** rating system assesses the sustainability of projects at all stages of the built environment life cycle. There are four tools available – Communities, Design and as Built, Interiors and Performance. Green Star benchmarks projects against the nine categories of: Management; Indoor Environment Quality; Energy; Transport; Water; Materials; Land Use & Ecology; Emissions and Innovation.

NABERS

National Australian Built Environment Rating System (NABERS) is a performance-based rating system for existing offices, hotels, shopping centres and data centres. It measures the energy efficiency, water usage, waste management and indoor environment quality of an existing building and provides a star rating based on this data. A building must be operational and occupied for at least 12 months prior to an assessment. NABERS has limited scope for application to council buildings except for the office tool. Where it is applicable a 4.5 to 5 star rating should be targeted.

STORM

Stormwater Treatment Objective Relative Measure (STORM) calculator measures if best practice stormwater objectives have been met by measuring the projected reduction in nitrogen pollution. 100% in STORM = 45% reduction in nitrogen. The general public can use the STORM calculator to design stormwater treatment systems for small residential, commercial and industrial developments, ensuring they achieve the stormwater treatment objectives required by state and local government planning provisions. It is easy and free to use, however its use should be limited to sites that only have one or separate stormwater treatment systems. See <http://storm.melbournewater.com.au>

MUSIC

Model for Urban Stormwater Improvement Conceptualisation (MUSIC) can model a wide range of treatment devices to find the best way to capture and reuse stormwater runoff, remove its contaminants, and reduce the frequency of runoff. MUSIC helps you to evaluate these treatment devices until the best combination of cost, hydrology and water quality improvement is achieved. MUSIC is an easy to use modelling tool for both simple and highly complex urban stormwater systems using water sensitive urban design (WSUD). It can simulate urban stormwater systems ranging from a suburban block up to a whole suburb or town (0.01 km² to 100km²). MUSIC is more sophisticated than STORM, allowing you to adjust many design dimensions and model a series of treatments, called a treatment train. The objective is to achieve the CSIRO Urban Stormwater Best practice Environment Guidelines which are Suspended solids – 80% reduction, Total phosphorous (TP) 45% reduction, Total nitrogen (TN) 45% reduction, Litter 70% reduction.

2.1 ESD policy statement

Building Type	Council Building Examples	ESD standard to be used	Process and Review
<p>Major new building All new major building works with a total design and construction value of \$10M or more (GST exc)</p>	<p>Libraries, Aquatic Recreation centres Sports Stadiums, Offices /Town halls Larger Community Centres, Arts and entertainment centres</p>	<p>SMP with certified Green Star 5 star rating as a minimum. A 6 star rating may be considered on an individual project basis. Independent ICA must be included as one of the Green Star credits. 100% on STORM tool or equivalent in MUSIC tool. NABERS assessments where applicable - Energy 5 stars and Water 5 stars</p>	<ul style="list-style-type: none"> Initial internal review including ESD Officer and Energy Projects Officer. Council appointed Independent Commissioning Agent (ICA) and external ESD Consultant with architect
<p>Major upgrade Major upgrade to an existing building with a total design and construction value of \$1M or more to \$10M (GST exc)</p>	<p>Upgrade to buildings listed above</p>	<p>SMP with Green Star 5 Star certified or targeted rating or SMP BESS assessment minimum 60% score. 100% on STORM tool or equivalent in MUSIC tool. NABERS assessments where applicable with minimum Energy 5 stars and Water 5 stars.</p>	<ul style="list-style-type: none"> Initial internal review prior to designer being appointed on ESD to be considered and included with ESD Officer, Energy Projects Officer and Facilities Maintenance Team External ESD Consultant with architect
<p>Medium new building Valued at \$1M to \$10M (GST exc)</p>	<p>Pavilions, Childcare and maternal and child health centres Aged Care/senior citizens centres Neighbourhood Houses, Community centres/halls</p>	<p>SMP Green Star 5 Star certified or targeted rating or SMP with BESS assessment minimum 60% score 100% on STORM tool or equivalent in MUSIC tool</p>	<ul style="list-style-type: none"> Initial internal review including ESD Officer, Energy Projects Officer and Facilities Maintenance Team External ESD Consultant with architect
<p>Medium upgrade/ extension from \$200,000 to \$1M (GST Exc)</p>	<p>Toilets and Small Pavilions Kiosks / Ticket Boxes Depot buildings & Larger Sheds</p>	<p>SMP or SDA with BESS tool minimum score 55% 100% on STORM tool or equivalent where applicable.</p>	<ul style="list-style-type: none"> Internal review including ESD Officer, Energy Projects Officer and Facilities Management team
<p>Minor refurbishment or end of life replacements \$200,000 to \$1M (GST Exc)</p>	<p>Plant and equipment replacement, building maintenance, ESD retrofits</p>	<p>SMP or SDA with BESS tool minimum score 55% 100% on STORM tool or equivalent where applicable.</p>	<p>Internal Review including ESD Officer, Energy Projects Officer and Facilities Management team</p>

Building Type	Council Building Examples	ESD standard to be used	Process and Review
Minor works and maintenance up to \$200,000 (GST Exc)	Retrofit of plant or building	Use <i>Council ESD minimum requirements</i>	Internal Review
Facilities Management Service Contracts	All buildings and structures. Contracts must specify minimum standards for procured products and services where applicable.	Use <i>Council ESD minimum requirements</i>	Internal Review Facilities Management team
Demolition		Minimum 70% to be recycled or reused.	Internal review
Other structures	Sail and shade structures, Stores / Sheds, Shelters, BBQ	Use <i>Council ESD minimum requirements</i>	Internal Review

2.2 Roles and responsibilities

Project management framework		
Project	REQUIREMENT	RESPONSIBILITY
Concept and planning		
Project Initiation Document (PID)	Determine the appropriate sustainability requirements (section 2.4) and other project specific sustainability initiatives and describe in project brief	Project management team and ESD Officer
Functional brief	Include the Sustainable Design Policy under Design Considerations	Project management team
Consultation and design		
Phase 1 - Planning and concept design	Include the SMP or SDA in the concept Design Tender Brief	Project management team ESD Officer
	Discuss ESD expectations with the appointed architect/designer at the beginning of the design process	Project management team and ESD Officer Energy Projects Officer
	Preliminary ESD report to be submitted by the Architect with final concept designs	ESD officer to sign off
Phase 2 – Design development	Ensure all ESD specification are included in the Architectural brief and tender, as determined in step 1 and included in this guide	Project management team

	Experience in Sustainable Building design is a tender criteria. For large projects the ESD officer and ESD consultant to be included in the team.	Project management team and ESD Officer
	Design decisions affecting the ESD result to be quantified and discussed with the project team during the process. Include ESD officer in on going meetings. <u>For Major New builds Only:</u> ICA to provide technical advice on design decisions affecting ESD outcomes	Project management team ESD Officer
	Final ESD report to be submitted by the architect and ESD consultant <u>For Major New builds Only:</u> ICA to review and provide advice relating to ESD Report	ESD officer and Energy Projects Officer
Procurement and construction		
	Any project changes or substitutions affecting the ESD result to be discussed and quantified by Project control group/ ESD Officer.	Project management team
Documentation and tendering	Any project changes or substitutions affecting the ESD result to be discussed and quantified by Project control group/ ESD Officer/ Energy Project Officer.	Project management team ESD Officer Energy Project Officer
Tender evaluation	All construction projects will include environmental management and/or performance as part of the evaluation criteria. All tenders will be required to include an Environmental Management Plan which will contain as a minimum measures taken to control: stormwater protection; waste and litter management; flora and fauna protection; dust management and noise and vibration;	Project management team
Construction	Building site manager checks to ensure builder compliance with ESD requirements and Environmental Management Plan Any project changes or substitutions affecting the ESD result to be discussed and quantified by Project control group/ ESD Officer.	Project management team ESD Officer
	<u>For Major New builds Only:</u> ICA to review and provide advice relating to ESD compliance	Project management team ESD Officer
Practical completion	Ensure all ESD requirements are achieved by builder before granting practical completion. Any project changes or substitutions affecting the ESD result to be discussed and quantified by Project control group/ ESD Officer.	Project management team ESD officer and Energy Projects Officer

	<u>For Major New builds Only</u> : ICA to review and provide advice relating to ESD, and to provide recommendation for Practical completion	Project management team ESD officer and Energy Projects Officer
Management	Building Users Guide prepared by architect, builder, environment team and Facilities Management team and occupant training where required. Maintenance team requirements for review to start	Environment team Facilities Management team
Warranties	Ensure all warranties are obtained for all ESD components.	Project management team
Handover	Handover documentation to include site specific ESD manual referencing design documents. Ensure all ESD related equipment is working to the highest efficiency.	Project management team Facilities Management team
	<u>For Major New builds Only</u> : ICA to review all documentation and provide recommendation for Handover	Project management team ESD Officer Energy projects officer
Handover and close		
Retention	ESD projects incorporating Monitoring & Verification requirements shall withhold retention monies until signed off.	Project management team. Facilities Management.
Post completion evaluation (6 to 12 months after occupancy)	Project architect or consultants or to provide summary report demonstrating energy and water use and any other relevant ESD targets has met predictions shown in the SMP/SDA and Building users guide (BUG).	Environment team and / or Facilities Management
Building tuning	Checks of systems every quarter at a minimum	Facilities Management
Benefits and realisation		
Case study/ lessons learnt	Case study projects to be documented and put on the Darebin website and provided to Capital Works and Major Projects staff and ESD Officer for future reference, updates to policy, etc. Include any impacts on sustainability performance. Develop a shared list of all ESD items in council buildings for all staff and the community.	Environment team Project manager Facilities management

2.3 – DAREBIN ESD MINIMUM REQUIREMENTS

The ESD minimum requirements outlined below apply as relevant to the mandated scope of works, to all major projects, capital works and building maintenance works. These should be discussed with the ESD Officer and Energy Projects Officer to check which items are feasible for the scope of works. All internal projects will apply this policy from project conception to ensure that initial project scope and budget preparation includes these minimum requirements.

MANAGEMENT		Y/N	Comments
M1	Commissioning Report		
			<ul style="list-style-type: none"> Where an Independent Commissioning Agent is engaged (an ICA is required for all Major projects), prior to practical completion of any project a commissioning report from the Independent Commissioning Agent must be provided confirming that the specified ESD minimum requirements have been implemented and that systems are performing in accordance with the design intent.
M2	Equipment		
			<ul style="list-style-type: none"> Ensure all equipment such as Building Management System (BMS), HVAC, water tanks, solar panels are maintained and checked to run at peak efficiency with regular check-ups.

BUILDING FABRIC		Y/N	Comments
BF 1	Walls, Roofs, Floors, Glazing		
			<ul style="list-style-type: none"> Entire building envelope insulation R-value to be 25% above BCA requirements, or meet the following R-values: <ul style="list-style-type: none"> – Walls R 2.25 minimum – Ceilings/ roof R 5. (Upper roof surface solar absorbance value to be not more than 0.4) – Floor R2 minimum – Vertical edge of any slab on ground R1.25 Refer to : http://icanz.org.au/wp-content/uploads/2013/04/17132_ICANZ_ThermalPerformance.pdf Independent of R-value requirements all external walls, roofs and lightweight floors must have an approved radiant barrier (i.e. Reflective Foil Laminate)

		<p>installed that has a NCC (National Construction Code) or a NFPA (National Fire Protection Association) flammability rating.</p> <ul style="list-style-type: none"> • Retrofit insulation wherever possible into renovations and extensions. • All new or replacement glazing in areas with active heating and cooling to be double or triple glazed and have glazing specifications of total system (including frames) to be 10% above BCA glazing calculator compliance, or meet the following two requirements: <ul style="list-style-type: none"> – Glazing systems with a maximum (total system) U-value of 2.8. – Glazing systems with a minimum visual light transmittance of 0.66. • For new buildings and renovations/extensions over 1000 sq.m, JV3 modelling should be undertaken to demonstrate a 25% improvement against the reference building. 		
BF 3	Daylight, shading and windows	<ul style="list-style-type: none"> • Maximise the use of natural light and use passive design principles. • Provide adequate daylight for all spaces. If areas appear to have limited daylight demonstrate a mean daylight factor of at least 2% through modelling or through Daylighting Rules of Thumb by Harvard University or Green Star Daylight Hand Calculation Guide. • Provide fixed or adjustable external shading - generally fixed to north and adjustable to all other orientations. Shading should prevent all direct sunlight entering the building through glazing between the end of October to the end of March between the hours of 9am and 7pm. A shading analysis should be provided to demonstrate compliance. 		
BF 4	Building Sealing	<p>Building Sealing is a requirement under BCA Section J3 Building Sealing.</p> <ul style="list-style-type: none"> • All windows and doors sealed and weather-stripped. • All exhaust fans to be fitted with self-sealing dampers. • Thermal bridging to be avoided 		

Heating Ventilation and Air Conditioning (HVAC)		Y/N	Comments
H1	Natural ventilation and passive cooling		
H2	Passive heating		
H3	HVAC Technology		
H4	Economy features		

- Use passive design principles to avoid excessive heat gain.
- Minimise west facing glazing, install fixed external shading to north glazing, install adjustable external shading to east and west windows and glazed doors, zone spaces to shut off rooms not in use and cool only rooms being used, locate non-habitable rooms on the west as a buffer from heat gain.
- Maximise operable windows and cross ventilation, use windows that maximise ventilation such as louvre and casement. Note – the NCC openable provisions do not guarantee effective ventilation.
- Use natural ventilation or a mix of natural and mechanical ventilation.
- Ceiling heights to be a minimum of 2.7 metres in occupied rooms so that ceiling fans can be installed safely.

- Maximise passive winter heating with north facing windows, double glazing, winter gardens and internal thermal mass that is insulated.

- Preference heat pump technology for heating and/or cooling instead of natural gas. Equipment to have Coefficient of Performance (CoP) and Energy Efficiency Ratios (EER) within 15% of the most efficient equivalent capacity unit available i.e. Most efficient equivalent capacity unit has a COP of 3.5 then an acceptable equivalent capacity unit would be no lower than COP 3 (calculated as 3.5 x .85).
- Where continuous 100% fresh air is required (i.e. Gymnasiums), Heat Ventilation and Air Conditioning systems will employ closed loop heat exchange technology with conversion efficiency greater than 75%.

- Motorised and fully modulating economy dampers to be fitted to all integrated Heat Ventilation and Air Conditioning (HVAC) systems (packaged or split ducted) with 100% outside air capability.
- All air handling unit (AHU) fans to include Variable Speed Drive (VSD) technology capable of being controlled by non-original equipment manufacturing (OEM) external direct digital controllers (DDC). Fan or pump motors to be direct drive. Belts and pulleys are not to be used.
- All heat pumps to employ variable refrigerant flow (i.e. Electronically Controlled variable Thermostatic Expansion (TX) valves or variable speed refrigerant flow/compressors)

Note that design plans must demonstrate that Heat Ventilation and Air Conditioning (HVAC) has been sized according to building load requirements

H5	Reverse cycle systems	<ul style="list-style-type: none"> • New or replacement systems to be highest energy star rating available for size (kW) and system required. 		
H6	Control Systems	<ul style="list-style-type: none"> • All HVAC changes to include control strategies that demonstrate and follow the load of the building in conjunction with ambient conditions. To be included but not limited to; pump speeds, CO2 sensor limits and thresholds, staging according to conditions. • All systems to utilise variable supply based on occupancy using CO2 monitoring and/or occupancy detection for zone ventilation control. This includes PIR for splits, fan coils, AHU's or VAV's (Projects that do not meet this requirement to submit to Energy projects Officer for approval) • Unitary controls – where systems employ unitary controls only, supplementary control shall be available for high level interface (HLI) to BMS or other systems as required. HLI shall be open protocol per relevant industry standards. • Building Management Systems (BMS) – Any BMS deployed to provide control and / or monitoring of equipment shall be capable of HLI to existing BMS used by council for supervisory control and data acquisition. 		

ENERGY			Y/ N	Comments
E1	Renewable Energy Systems	<ul style="list-style-type: none"> • For new construction of buildings expected to consume less than 10 MWh/ year (e.g. toilet blocks): To be designed to be energy independent with their own renewable energy source (solar PV and backup). Project executive may delete from the specifications due to financial restraints, subject to a report being tabled documenting the initial and ongoing costs/ efficiencies comparisons based on expected energy use. • All other projects: Installation of a micro-generation renewable energy system to supply a minimum of 25% of annual building energy consumption is required, however where not practical or budget does not allow the Project Executive may delete from the specifications subject to a report being tabled documenting the initial and ongoing costs/ efficiencies comparisons. If solar PV system not feasible, design building to accommodate the installation of solar PV, batteries and battery management system that 		

		maximises solar irradiance at a future stage.		
E2	Separate metering	<ul style="list-style-type: none"> Install separate metering and zoning for different tenants. 		

Lighting			Y/N	Comments
L1	Technology	<ul style="list-style-type: none"> LED technology exclusively for all lighting up to 500 watt input for single luminaires. LED, Metal Halide (HID) or Induction Fluorescent technology: high output requirements above 500 watt input for single luminaires (typically outdoor area lighting and water activity.) 		
L2	Illumination	<ul style="list-style-type: none"> Lighting illumination power density (IPD) target of no greater than 5 watts/sq. metre average across the building (indoor lighting). Low upward light spill ratios (i.e. no deflected or up lighting unless agreed by project team and meets above target) with colour rendering index (CRI) 80 and above. Design lux levels of between 240 minimum and 280 maximum for general lighting unless otherwise specified, combined with task lighting (e.g. desk lamps, directional spotlights, built in workstation lighting etc.) in specific areas when higher lux levels are required (indoor lighting). Lower lux levels (80) for corridors, walkways, store rooms, etc. Australian Standards and NCC requirements must be complied with for lighting. 		
L3	Control systems	<ul style="list-style-type: none"> Lighting control to be linked to building management systems (BMS) and/or security system. Motion detectors in all areas with inconsistent use such as toilets, stores rooms, meeting rooms, etc. Sensors to be positioned above the entry of the room facing the activity area. 		
L4	Other	<ul style="list-style-type: none"> Design for easy access to change lights. Factor in cost of changing light bulbs and maintenance when costing. 		

EQUIPMENT AND APPLIANCES FITOUT		Y/N	Comments
EA 1	Equipment Efficiency standards		
	<ul style="list-style-type: none"> Refrigeration equipment to be designed so rejected heat can be expelled easily to outside or reused for heating within building. Only high energy efficient hand dryers utilising no heat, high air speed technologies along with air filters to promote hygiene are to be installed in toilets, bathrooms and change rooms. Paper towels and paper towel dispensers are not to be used unless hand dryers are considered to be unsuitable (with supporting evidence). Highest available energy efficient ventilation systems, extraction fans, etc. Equipment used in fit out to be within one star rating of best available technology for energy and water efficiency. i.e. fridge / freezer / dishwasher (5 star water rating and 4 star energy rating minimum) / oven / cook top / range hood/ hot water urns. Gas appliances to be avoided where possible. Install timers on tea and coffee boilers so they switch off over weekends and overnight. No urns to be used. Energy efficiency of appliances can be confirmed on the website www.appliancesonline.com.au with performance ratings based on information provided on the website www.energyrating.gov.au 		

HOT WATER		Y/N	Comments
HW1	Hot Water Technology		
	<ul style="list-style-type: none"> Council has a preference for high efficiency heat pump electric hot water systems that can link to existing, new or future solar PV. Gas hot water should be avoided. Where gas boosted hot water is required this will be acceptable only with agreement by the Project Executive. https://www.rec-registry.gov.au/rec-registry/app/calculators/swh-stc-calculator Hot Water heat pump technology to have Coefficient of Performance (CoP) Ratio 85% or better than the most efficient equivalent capacity unit available. Hot water system gas boosters to be high efficiency and employ condensing technology at or greater than 96% net efficiency (including manifolded arrays where staged multiple units are required). Hot Water storage systems with integral natural gas boosting not to be used. 		

HW2	Pipe insulation	<ul style="list-style-type: none"> • All hot water piping (flow and return) above 25mm Outside Diameter (OD) shall be insulated with pre formed sectional glass wool or polyester insulation or similar, having a maximum thermal conductivity of 0.036 W/m2.K at 20°C mean temperature. All exposed pipe work insulation shall be sheathed with 0.5mm thick zinc anneal sheet metal or approved equivalent. All sheathing shall be installed in a manner which resists entry of water and UV light. • All hot water pipes (flow and return) 20mm Outside Diameter (OD) or less shall be fully insulated with Armaflex FR 13mm or approved equivalent. • All exposed pipe work insulation shall be sheathed in a UV protective coating, i.e. foil tape or equivalent coating. All sheathing shall be installed in a manner which resists entry of water and UV light. <p>Note: Pre-lagged (Kemlag or Polylag) pipe not to be used.</p>		
HW3	Control Systems	<ul style="list-style-type: none"> • Ring main hot water systems will include a digital time clock control mechanism that: <ul style="list-style-type: none"> + prevents hot water circulation during non-occupancy hours. + starts ring main at least one hour prior (or greater if required for occupational and health and safety requirements) to building occupancy to circulate any accumulated bacteria through 60 degree water to kill any legionella bacteria. • Preference for connection to a Building Management System (BMS) or building security system. 		

WATER EFFICIENCY AND STORMWATER		Y/N	Comments
W1	Fixtures and fittings		
	Other		

W2	appliances	Water efficiency of appliances can be determined by using http://waterrating.gov.vic.au/consumers/index.html		
W3	Rainwater tanks	<ul style="list-style-type: none"> • Rainwater harvesting system to supply toilets, urinals, laundry, landscape irrigation, etc. Match roof capture area and tank size to expected use. The Tankulator tool (http://tankulator.ata.org.au/) can help size tanks appropriately to expected use. • Tanks to have adequate filtration when connected to internal uses. Gutter guards, first flush diverters, etc. need to be considered. 		
W4	Stormwater	<ul style="list-style-type: none"> • Achieve a minimum of 100% in the Melbourne water STORM tool (where applicable) or equivalent in the MUSIC tool. • Achieve at least 75% of car park hardstand area stormwater runoff to be treated by infiltration rain garden or other WSUD feature • Maximise permeable areas. 		

IEQ AND MATERIALS			Y/N	Comments
M1	Materials	<ul style="list-style-type: none"> • Select materials from ecospecifier, GECA or Green Star where possible http://www.ecospecifier.com.au/ http://www.geca.eco/ http://new.gbca.org.au/ • Consider the Life Cycle of all materials - select materials with a low embodied energy, that are durable, low maintenance, have a recycled content, that can be recycled, that have buy back schemes, etc. 		
M2	External surface finishes	<ul style="list-style-type: none"> • Light materials with Solar Reflectance Index (SRI) in accordance with the Green Star criteria for the heat island effect are to be used for roof and external facade to reduce urban heat island effect and reduce cooling load (Roofing material preference: Colorbond Coolmax or approved equivalent) 		
M3	Timber	<ul style="list-style-type: none"> • Where possible all timber used to be FSC (preferred) or PEFC certified or re-used/recycled. • The use of tropical hardwoods such as Merbau, Mirabow, Ipil, Kwila, Vesi are not permitted under any circumstances. 		

		<ul style="list-style-type: none"> • All engineered wood products, including office furniture and fit outs to comply with E0 standard for formaldehyde levels. Where no E0 Product is readily available criteria within the Green Star Formaldehyde Minimisation credit can be applied. • The use of laminated timber structural members (plantation) will be given precedence over native hardwood structural members. 		
M4	Poly Vinyl Chloride (PVC)	<ul style="list-style-type: none"> • To reduce environmental and health impacts for building users, internal plastic materials (e.g. vinyl flooring and carpet underlays) should exclude PVC. Where PVC is used apply Best Practice Guidelines for PVC in the Built Environment by specifying eco-labels (e.g. Global-Mark Certified) that comply with the Green Star PVC credit. A Material Safety Data Sheet is a means of verifying that a product does not contain PVC. https://www.gbca.org.au/green-star/revised-green-star-pvc-credit/2716.htm 		
M5	Internal surfaces and finishes	<ul style="list-style-type: none"> • Zero or Low Volatile Organic Compound (VOC) office furnishings, flooring and internal coatings (i.e. paints, adhesives and sealants) in accordance with the Green Star Rating Tool. • Plasterboard with recycled content. 		
M6	Concrete	<ul style="list-style-type: none"> • All concrete to have a recycled content and use recycled aggregate wherever possible 		
M7	Steel	<ul style="list-style-type: none"> • Preference steel suppliers who meet the objectives of Green Star Rating tool i.e have a valid ISO 14001 Environmental Management System certificate and are a member of the World Steel Association (WSA) Climate Action program (CAP). • Where possible use steelwork fabricators, steelwork processors and contractors that have signed up to the Environmental Sustainability charter of the Australian Steel Institute (ASI). http://steel.org.au/asi-committees/environmental-sustainability-charter/find-a-charter-member/ 		

TRANSPORT			Y/N	Comments
T1	Bike parking	<ul style="list-style-type: none"> Secure mix of on wall and on ground bicycle parking for staff and visitors in excess of planning scheme and/or to meet BESS Best practice. Covered bike parking wherever possible. Provide showers and change rooms for staff. Continuous and accessible travel to the bike parking area. 		
T2	Electric cars and bikes	<ul style="list-style-type: none"> Allowance for at least 2 single phase sub-circuits (40 Amp capacity) on switch board to allow for e - vehicle recharging for projects over \$5million that have a carpark. 		

WASTE AND RECYCLING			Y/N	Comments
W1	Demolition	<ul style="list-style-type: none"> Where building works require partial or complete demolition at least 70% (by weight) of all demolished materials will be recycled or reused with verification. The Green Star tool has a suitable method of assessing recycling of materials. 		
W2	Recycling	<ul style="list-style-type: none"> Design to maximise recycling inside with double or triple bins and outside with equal access for waste and recycling bins Provide space for green bins and compost bins. All lights to be recycled at the Council Office carpark or make arrangements for recycling on-site. 		

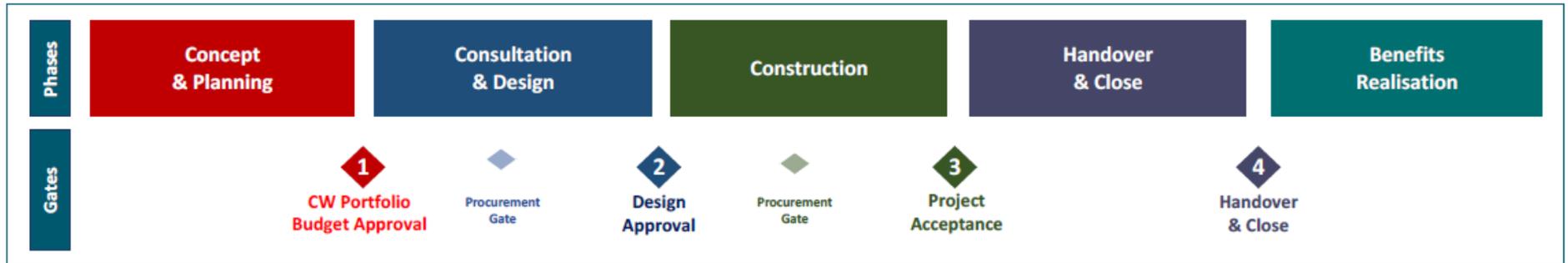
3.1 Monitoring and Reporting

An annual report for the previous financial year will be prepared for Council in October based on the following measures. This evaluation will also be included in the Benefits Realisation process for each project..

Performance measure	Target	Reporting Responsibility
<i>Percentage (%) of capital building projects undertaken during the financial year complying with policy</i>	<i>100%</i>	<i>Infrastructure and Capital Delivery Unit</i>
Performance of upgraded buildings against key environmental performance targets	<i>Reduced energy usage as a %</i> <i>Increased renewable energy in kW</i> <i>Reduced potable water usage in kL</i> <i>Increased Water harvesting/Reuse in kL</i> <i>CSIRO Urban Stormwater Best practice Guidelines have been met and demonstrated through the STORM or MUSIC tools.</i> <i>Sustainable transport infrastructure improvements (# of bike parks etc)</i>	<i>Environment and Sustainable Transport</i>
Waste	<i>Demolition projects achieve 70% of demolished materials recycled or reused.</i> <i>% Recycled content achieved in building materials (by weight)</i>	<i>Infrastructure and Capital Delivery Unit</i>

Exception reporting will occur throughout each project with project manager to liaise with ESD officer where outcomes are unable to be met.

Appendix A Capital Works Portfolio Management Framework



Project Initiation Document (PID) to have approved ESD budget or a minimum of 4% allocated for ESD.

SMP, SDA or ESD minimum requirements list to be checked by ESD officer and other relevant parties.

Architects, building designers, ESD consultants, builders to be approved for ESD experience and knowledge. Design development drawings to be checked by ESD Officer and other relevant parties to ensure all commitments included.

Consultants to be approved for experience with ESD. Working drawings and schedule documents to be checked to ensure all ESD items are included and sustainable procurement guidelines are followed.

All manuals for all systems and appliances, and schedules for maintenance to be given to Facilities Management and Building manager. Building Users Guide to be written by Environment team and given to occupants.

Project manager, Environment and Community Outcomes team and Facilities Management Team to review all benefits articulated in the approved PID 12 months after closure. Benefits and lessons of ESD items to be shared to all stakeholders.

Appendix B Glossary of Terms

BCA	Building Code of Australia
BESS	Built Environment Sustainability Scorecard (BESS) is an assessment tool created by local governments in Victoria. It shows how a proposed development demonstrates sustainable design at the planning permit stage. http://www.bess.net.au/
ESD	Environmental Sustainable Development
Ecospecifier	Sustainable materials and products database. http://www.ecospecifier.com.au/
GBCA	Green Building Council of Australia www.gbca.org.au
GECA	Good Environmental Choice Australia - Sustainable materials and products database. http://www.geca.eco/
GFA	Gross Floor Area – a measure of the size of a building
Green Star	Green Star building environmental rating system administered by the Green Building Council of Australia.
HVAC	Heating, Ventilation And Cooling (building systems)
ICA	Independent Commissioning Agents role is to advise monitor and verify the running of building systems such as HVAC. They must be independent from the design and construction of the building.
kWh	Kilowatt Hour - a measure of electricity consumption
MWh	Megawatt Hour- a measure of 1,000 kWh of electricity consumption
MSS	Municipal Strategic Statement
MUSIC	Model for Urban Stormwater Improvement Conceptualisation – A tool that predicts the performance of stormwater quality management systems by measuring the predicted levels of pollution.
NABERS	National Australian Built Environment Rating System is a performance-based rating system for existing offices, hotels, shopping centres and data centres.
NCC	National Construction Code
OH&S	Occupational Health and Safety
PVC	Polyvinyl chloride is a common material used for plumbing pipes and electrical cables. The manufacture requires toxic chemicals and disposal is also toxic
R value	A measure of heat transfer that is used for insulation. The higher the R value the lower the heat loss from inside in winter and heat gain when hot outside.

SDA	Sustainable Design Assessment
SMP	Sustainable Management Plan
STORM	Stormwater Treatment objective relative measure calculator measures if best practice stormwater objectives have been met by measuring the projected reduction in nitrogen pollution. 100% in STORM = 45% reduction in nitrogen. See http://storm.melbournewater.com.au
U value	A measure of the heat transfer from inside to outside that is used for windows. Lower u value = less heat loss.
VOC	Volatile Organic Compounds
WELS	Water Efficiency Labelling Scheme – benchmarks water efficiency and applies a WELS star rating of 1 to 6 stars
WMP	Waste Management Plan
WSUD	Water Sensitive Urban Design