

Green Star

Design Intent Report

Template

September 2013

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| --- | --- |
| **Date** | **Change** |
| **16th Sept 2013** | Draft Issued for Comment |

# About this template

This document has been developed to provide project teams a template when developing the Design Intent Report for their project. The development of a Design Intent Report is a requirement of credit Man-2 'Commissioning Clauses' (also referred to as 'Commissioning' in the Green Star - Industrial v1 and Green Star - Public Buildings v1 rating tools and Man-2 'Tenancy Fitout Commissioning' in the Green Star - Office Interiors v1.1 rating tool) .

This Design Intent Report template can be used by project teams when preparing their documentation for a Green Star design rating. It provides the structure of the Design Intent Report and provides example text to provide guidance on the type of information required under each heading. Please note, that the example text provided in this template is taken from various sources and together is not intended to represent an actual building in its entirety. The example text under each heading should be read in isolation and is provided to give project teams a sample of information relevant to each section.

In order for the Design Intent Report to be an effective tool, the project must include building specific information throughout the document.

This document is being released as a draft for comment. GBCA encourages project teams to use this guide to develop their Green Star submissions. In addition, GBCA invites people to provide feedback on the guidance stated below.

# Design Intent Report

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# <Building’s name> Design Intent Report

## Building address

### 

### Record of Changes

| Version | Date | Nature of Amendment |
| --- | --- | --- |
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|  |  |  |
|  |  |  |
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|  |  |  |

<copyright information, if any

# 1. Introduction

This building has been designed to incorporate a range of sustainable building principles which will help the building operate in an efficient and cost-effective manner. This Design Intent Report (DIR) has been developed to provide the building owner with details of the building's nominated systems with the aim of ensuring the systems operate to optimal design potential.

This DIR also includes the following:

* Targets for the reduction of energy, water and waste;
* A description of the buildings services and operational requirements for efficient and safe use of these systems;
* Building initiatives to reduce energy and water use; and
* Monitoring provisions for energy, water and indoor environment quality.

The DIR covers the following nominated systems:

* Mechanical systems [provide specifics here – this may include HVAC and refrigeration systems, mechanically operable systems such as blinds and actuated shading devices];
* Ventilation systems;
* Electrical systems [provide specific examples here – this may include systems such as electrical generation, electrical supply, distribution systems, security and alarm systems];
* Lighting controls;
* Hydraulic systems [provide specifics here – this may include gas and water supply distribution systems, sewage collection and distribution systems, stormwater collection and distribution systems];
* Building Management and Control System;
* [Include any other systems that have an impact on water or energy consumption within the building.]

[Note: Do not include fire and lift systems, as these have separate commissioning practices and are not covered under credit Man-2 ‘Commissioning’.]

## 1.1 Commitment to Sustainability

[Include details of any Environmental/ Energy or related policies and commitments of the building owner.]

**Example:**

Green Star certified buildings contain a number of environmental benefits including the following:

* On average, Green Star certified buildings produce 62% fewer greenhouse gas emissions than average Australian buildings.
* On average, Green Star certified buildings produce 45% fewer greenhouse gas emissions than if they had been built to meet minimum industry requirements.
* On average, Green Star certified buildings use 66% less electricity than average Australian buildings.
* On average, Green Star certified buildings use 50% less electricity than if they had been built to meet minimum industry requirements.
* On average, Green Star buildings use 51% less potable water than average buildings.
* On average, Green Star As Built certified buildings recycled 96% of their construction and demolition waste.
* Since Green Star’s introduction to the market in 2003, more than 5.5 million square metres of building area have been Green Star certified.
* Green Star certified buildings save the equivalent of 76,000 average households’ electricity use annually.
* 37,600 truckloads of construction and demolition waste has been diverted from landfill due to good waste management practices when constructing Green Star certified buildings.
* The higher the Green Star certified rating of a building (4, 5 or 6 star) the greater the environmental savings across all key areas – greenhouse gas emissions, energy use, water consumption, and construction and demolition waste.

The most effective way to address the environmental impact of buildings, their construction and operation, is at the design stage. It is then that key decisions are made about passive and active systems to be incorporated into the building; of which materials and products are to be used and when space is allocated for initiatives and innovations that may be otherwise excluded from the design. The costs associated with incorporating various features and systems can be analysed over the life-cycle of the building to assess the effectiveness and feasibility of different initiatives.

Green Star was developed by the GBCA to:

* establish a common language
* set a standard of measurement for built environment sustainability
* promote integrated, holistic design;
* recognise environmental leadership;
* identify and improve life-cycle impacts; and
* raise awareness of the benefits of sustainable design, construction and urban planning.

It is conditional requirement of obtaining a Green Star - Office v3 rating that the base building’s predicted greenhouse gas emissions not exceed 110 kgCO2/m2/annum.

# 2. Key Personnel

The following are details of key personnel involved with the building:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Position | Responsibility | Telephone number | Email address |
|  | Eg Owner’s representative |  |  |  |
|  | Eg Building Services designer |  |  |  |
|  | Eg Commissioning agent |  |  |  |

# 3. About Building

[Provide a short description of the building including any other uses (such as retail, community facilities etc)]

## 3.1 Mechanical Systems (Heating, Ventilation and Cooling System)

[Provide a simple description of the HVAC system including the following:

* Provide a simplified diagram of the system]

**Example:**

The HVAC has been designed to include active chilled beams and constant volume Air Handling Units. The cooling system will be served by high efficiency mechanical chillers located on the roof. The heating system will be provided with heating from gas fired boilers on the roof.

### 3.1.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

The HVAC system has been designed to the following Design Criteria.

|  |  |
| --- | --- |
| Item | Design Criteria |
| Ambient design conditions for  air conditioning plant | Summer:-  36.6 ºC dry bulb maximum  23.0 ºC wet bulb maximum  Full solar load  Winter:-  6.0 ºC dry bulb minimum  Zero solar load |
| Internal conditions for air conditioning plant | Summer: 23.0ºC +/- 1.5K dry bulb  50% Relative Humidity (Anticipated – Not controlled)  Winter:- 21.0ºC +/- 1.5K dry bulb minimum |
| Ventilation | In accordance with AS1668.2 – 1991 – plus 50% additional to meet Green Star requirements - Generally 11.25 l/s / person. |
| Etc |  |

### 3.1.2 Components and Importance of Efficient Use

[List the main components (including control) and the importance of their efficient use].

**Example:**

The cooling and heating systems shall comprise of the following:

Four heat recovery variable refrigerant volume (VRV) systems consisting of high efficiency air cooled condensers to be located on the external roof deck connected via insulated refrigerant pipework to internal ducted fan coil units (FCU’s) located in the building's ceiling space.

Conditioned air from the FCU’s will be delivered to the occupied spaces via insulated steel and flexible ductwork and ceiling mounted high induction radial swirl diffusers.

### 3.1.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

Maintenance is essential in ensuring the systems perform according to the design criteria. The following outlines the maintenance requirements of the HVAC system to ensure it performs optimally.

|  |  |
| --- | --- |
| Item | Frequency |
| Maintain air handling systems in accordance with requirements of the referenced Standards/Codes and Statutory Authorities | Every 3 months |
| Inspect air handling units and perform service work, as necessary to ensure the correct operation and performance of the plant | Every 3 months |
| Check operation of internal lights and repair as necessary | Every 3 months |

### 3.1.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the HVAC system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Loss of thermal comfort / excessive temperature fluctuations throughout the day | Sensor is not measuring correctly | Recalibrate and restart system |
| Time taken to reach set point temperatures in the morning warm up cycle | Sensor is not measuring correctly | Check the location of the sensor and if required move.  Recalibrate and restart system |
|  |  |  |

### 3.1.5 System Efficiency

[Outline any notes on how to maintain efficiency of the system]

**Example:**

To maintain system efficiency, the following should be addressed:

* Adjust control system to better match occupancy patterns and seasonal temperature.
* Adjust set-point temperatures per the Design Criteria to account for clothing factors.

## 3.2 Ventilation System

[Provide a simple description of the ventilation system including the following:

* Provide a simplified diagram of the system]

**Example:**

The ventilation systems within the building are designed to provide high quality air to a variety of spaces. These include providing dedicated fresh air intake fans to the heating and cooling systems on each floor to ensure that good indoor air quality is maintained by reducing the build-up of indoor air pollutants. A dedicated air supply system has been designed for the BMS to reduce the build-up of waste heat from the BMS.

Dedicated exhaust systems have been designed for each of the following:

* Tenant print and photocopy rooms;
* Toilets;
* Recycling waste storage room ; and
* Car park.

### 3.2.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

In order to improve air quality and in accordance with Green Star the ventilation has been designed to increase fresh air intakes by 50% as measures against the minimum code standards.

### 3.2.2 Components and Importance of Efficient Use

[List the main components (including control) and the important of their efficient use]

**Example:**

The car park exhaust system has been design to include inline fans located within the ground floor bin store and sheet metal exhaust ductwork within the car park. The fan design includes a variable speed drive (VSD) to be controlled by a carbon monoxide (CO) monitoring detection system throughout the car park. The system shall operate the fan at the lowest possible speed (and hence lowest energy use) whilst maintaining acceptable ventilation rates within the car park....etc

### 3.2.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

The following outlines the maintenance requirements of the ventilation system to ensure it performs as intended by the design.

|  |  |
| --- | --- |
| Ventilation systems | Frequency (months) |
| Maintain ventilation systems in accordance with requirements of the referenced Standards/Codes and Statutory Authorities | Every 3 months |
| Inspect the system and perform service work, as needed to ensure the correct operation and performance of the plant | Every 3 months |
| Etc |  |

### 3.2.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the ventilation system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Discomfort from a loss of ventilation | Sensor is not measuring correctly | Recalibrate and restart system |
| Odours present in occupied areas | Fans have stopped working | Reset and restart ventilation system or repair the fault. |
| Ventilation system operation out of hours | Schedule has not been maintained | Re-schedule the ventilation system to operate during hours of occupancy |

### 3.2.5 System Efficiency

[Include any notes on how to maintain system efficiency]

**Example:**

To maintain efficiency of the ventilation system, the following should be undertaken:

* Keep pre-conditioner filters and/or heat exchange surfaces clean. When these become dirty it leads to high energy use and a loss of performance.
* Keep air handling unit filters clean. When these become dirty it leads to high energy use by the fans.

## 3.3 Electronic Systems

[Provide a simple description of the electronic system including the following:

* Provide a simplified diagram of the system]

**Example:**

Incoming power shall be provided by the Electrical services utility. Space has been provided for the future installation of generators, should tenants wish to provide back up for their power supply.

### 3.3.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

The design of electrical services has been carried out in order to minimise greenhouse gas emissions associated with operational energy consumption and maximise potential operation efficiency of the base building services. All electrical lighting and power services have been selected and approved in consultation with the architect and developer with the aim of minimising energy consumption.

### 3.3.2 Components and Importance of Efficient Use

[List the main components (including control) and the important of their efficient use]

**Example:**

The following is a brief description of the Electrical Services designed for this Building:

* Electrical Substation: The electrical substation shall be located at the ground level of Building B. It will consist of two (2) transformers to feed the Building Main Switchboard.
* Main Switchboards: The Main Switchboard shall be located in a dedicated Switchroom on the basement level.
* Power shall be distributed from the main switchboards to the rest of the building.
* Energy Metering: Energy metering shall be provided for mechanical plant, lifts general light and power, tenant floor light and tenant floor power for loads over 100kVA. The energy meters are designed to connect to the building BMS system for ease of monitoring and collection of data

### 3.3.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

The following outlines the maintenance requirements of the electrical system to ensure it performs as intended by the design.

|  |  |
| --- | --- |
| Item | Frequency |
| Single Phase | Inspection and testing to BS 7671 |
| 3 Phase | Inspection and testing to BS 7671 |

### 3.3.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the electrical system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Power failure | Failure of mains to provide electricity | Contact energy utility and rectify issue |
| Distribution board isolation |  | Maintain clearance and isolation around switchboard cupboards. |
| Significant changes in energy usage | Systems not operating to design intent | Check metering data and determine cause of usage patterns. Where needed, maintain system and continue to monitor. |

### 3.3.5 System Efficiency

[Include any notes on how to maintain system efficiency]

**Example:**

To maintain efficiency of the electrical system, the following should be undertaken:

* Where a fault is found in the system ensure it is fixed in a timely manner. Failure to do so will result in increased energy use.
* Undertake regular energy audits to review BMCS metering data and check for signs of inefficient scheduling, malfunctioning equipment or inefficient energy use. Through this, the intent of the design can be maintained throughout the building's operations.
* Follow manufacturer’s maintenance instructions and only allow qualified personnel to perform maintenance.

## 3.4 Lighting Systems

[Provide a simple description of the lighting system including the following:

* Provide a simplified diagram of the system]

**Example:**

The Lighting Control design is based upon maximum flexibility to give control to occupants. The design provides a system that can be refit completely without the need to rewire, while providing control to each individual light fitting.

### 3.4.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

Lighting Controls: A programmable automatic control system has been designed to be employed throughout the Building. The typical open plan office floor lighting shall consist of high efficiency T5 luminaires in suspended ceilings with compact fluorescents downlights in lift lobbies and amenities.

Lighting to the open plan office floors shall be connected to the tenant distribution boards whilst lighting in amenities and lift lobbies shall be connected to the house distribution board.

A lighting control system shall be connected throughout the building to allow lighting areas to be automatically switched on and off or dimmed depending on inputs from the following:

* Local switches
* Motion detectors
* Daylight sensors
* Photocell detectors
* Floor override switches

### 3.4.2 Components and Importance of Efficient Use

[List the main components (including control) and the important of their efficient use]

**Example:**

Each level will be provided with its own individual lighting control – these installed control systems are designed to be flexible and as such the floor lighting configurations will be adaptable to a Tenants' requirements. The lighting shall be programmed to retain automatic dimming based on daylight levels and motion detection. Override switches/Light Switch Panels shall be provided to each tenancy level to be used by cleaners to allow 100% lighting to the floor for a maximum preset time.  
The lighting in toilets, stairwells and other transitional areas are designed to be automatically controlled.

### 3.4.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

The following outlines the maintenance requirements of the lighting system to ensure it performs as intended by the design.

|  |  |
| --- | --- |
| Item | Frequency |
| Tubular fluorescent  Periodic clean and replacement | Lamp life of order of 10 000 hours (e.g. 3 years at 10 hours per day, 6 days per week) |
| Compact fluorescent  Periodic cleaning and replacement | Lamp life of order of 8000 hours |
| High bay luminaires  Periodic cleaning and lamp replacement | Lamp life  height 12 000 to 22 000 hours, depending on type |
| Etc. |  |

### 3.4.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the lighting system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Greater than expected after hours lighting use | System not operating to design intent or a change in occupancy patterns | Review cleaning staff procedures for turning on / off lights  Modify benchmark targets to reflect actual business operation |
| Poor lighting zoning | A reconfiguration of tenancy | Re-check light zones against office layout and rectify where needed |
| Lights flickering | Faulty light | Replace light |

### 3.4.5 System Efficiency

[Include any notes on how to maintain system efficiency]

**Example:**

To maintain efficiency of the lighting system, the following should be undertaken:

* Turn off unused lights to prevent energy wastage.
* Carry out after hours cleaning on timed controls and interface to turn on and off via the security. This will reduce energy wastage through lighting afterhours.
* Carry out planned preventative maintenance to ensure the lighting system operates optimally and in accordance with the design intent.

## 3.5 Hydraulic Systems

[Provide a simple description of the hydraulic system including the following:

* Provide a simplified diagram of the system]

**Example:**

Water saving fixtures and fittings have been incorporated in the design of the hydraulic systems. The building shall utilise a Greywater recycling system to collect water from the basins for reuse in toilet flushing.

### 3.5.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

Domestic hot water shall be supplied to amenities within the building by a gas hot water system located to be located in the basement of the building. The hot water system shall be equipped with a water sub-meter on the mains feeding into the hot water system and on the hot water return from each level back to the hot water system in the basement.

### 3.5.2 Components and Importance of Efficient Use

[List the main components (including control) and the important of their efficient use]

**Example:**

The Hydraulic Services for this project consist of the following:

* Grey water Recycling System
* Sanitary Drainage
* Potable Hot and Cold Water Services
* Stormwater Drainage
* Natural Gas Service
* Fire Services

### 3.5.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

The following outlines the maintenance requirements of the hydraulic system to ensure it performs as intended by the design.

|  |  |
| --- | --- |
| Item | Frequency |
| Check for water leaks, excessive water use, loose fitting | Every month |
| Clean drains and drip trays | Every 6 months |
| Etc. |  |

### 3.5.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the hydraulic system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Extended use | System not operating to design intent or a change in usage and occupancy patterns | Modify benchmark targets to reflect actual business operation  Provide education and signage on efficient use of water |
| Leaks from fittings and fixtures | Faulty system | Undertake regular inspections  Install a leak detection system |
| Fluctuations in water pressure | Faulty pumps | Check pumps for faults and warning signs and rectify where needed |

### 3.5.5 System Efficiency

[Include any notes on how to maintain system efficiency]

**Example:**

To maintain efficiency of the hydraulic system, the following should be undertaken:

* Check water meters regularly to ensure water is monitored effectively. The effective monitoring of water allows efficient use to be maintained during building operations.
* Ongoing education will ensure that building occupants continue to use water efficiently.

## 3.6 Building Management and Control Systems

[Provide a simple description of the BMCS system including the following:

* Provide a simplified diagram of the system]

**Example:**

Electrical and water consumption shall be metered within the building and connected to the building management and control system (BMCS). Building Managers will be required to compile reports from the BMCS information to use in quarterly assessments of building performance.

### 3.6.1 Intended Operation of the System

[Describe the intended operation of the system]

**Example:**

The BMCS has been designed to have the capability to generate reports on a monthly and/or as required basis for energy and water meters t. The following information will be able to be obtained from the BMCS:

* Tenant / House / Use;
* Meter No, Billing Address and Contact;
* Monthly use;
* Graph of previous 12 months usage (rolling time scale);
* Average daily use;
* Actual versus target; and
* Cost.

### 3.6.2 Components and Importance of Efficient Use

List the main components (including control) and the important of their efficient use

**Example:**

The BMCS shall also collate the building’s base energy consumption and provide this in a report format . The base building energy report will include the following:

* HVAC systems (VRV, mechanical vent, car park, bin store etc);
* Lifts;
* House / Common area lights and power (i.e. lobby, car park, external lighting, toilets);
* Monthly use (total and individual service);
* Graph of previous 12 months usage (rolling time scale);
* Average daily use (total and individual service);
* After hours use of each services;
* Peak Demand;
* Actual versus target consumption;
* Cost; and
* GST.

### 3.6.3 Maintenance Needs

[Detail maintenance needs]

**Example:**

The following outlines the maintenance requirements of the BMCS system to ensure it performs as intended by the design.

|  |  |
| --- | --- |
| Item | Frequency |
| Training on Mechanical Systems to the Facilities Manager | During first 12 months |
| BMCS operational monitoring | 3 months |
| Etc. |  |

### 

### 3.6.4 Signs of System Failure

[Outline tell-tale signs of system failure]

**Example:**

The following table includes a list of issues that may arise should the BMCS system fail. It also includes actions to be taken should this occur.

|  |  |  |
| --- | --- | --- |
| Issue | Cause | Follow up action |
| Power failure | Power failure | The BMCS shall rely on battery backup to retain program memory and time-clock information. |
| System failure | Power failure | Undertake regular inspections and maintenance of the system.  Re-commission the system to ensure it operates as intended. |
|  |  | Check pumps for faults and warning signs and rectify where needed |

### 3.6.5 System Efficiency

[Include any notes on how to maintain system efficiency]

**Example:**

* BMCS sub-contractor will demonstrate and explain the operating features of the BMCS.
* Energy monitoring protocols will be set-up to monitor and trend-log the energy consumption levels of the various services to enable energy target levels to be tracked on a monthly basis with predictive end-of-year targets displayed.
* Building tuning will be undertaken for the first year of operation to ensure efficient operation of BMCS system.

# 4. Energy Strategy

The building has been designed to incorporate a range of initiative to reduce energy demand and to manage energy use in an efficient manner.

## 4.1 Benchmarks and targets

|  |  |
| --- | --- |
| Benchmark Energy Use | [insert benchmark] watts/m2 or the ABGR Rating |
| Energy Reduction Target |  |
| Greenhouse gas emissions saved resulting from energy reduction target | tonnes / year |
| Cost savings resulting from achieving energy reduction target | $ / year |

## 4.2 Description of building’s nominated systems

[Describe the nominated energy related systems in the building]

## 4.3 Energy Reduction Strategies

[Describe the initiatives incorporated in the design of the building to enhance energy efficiency and minimise greenhouse gas emissions. Include details of what building occupants should do to maximise benefits from the design strategies

**Example:**

The main energy saving features of the ventilation system are as follows:

* Active chilled beams: By passing water through the chilled beam coils, rather than using air as the primary cooling medium, air quantities are reduced by around 50%, with around 30% saving in fluid handling power.  
  Active chilled beams work best in open plan office environments with low humidity gain. This allows them to use the warmest possible supply air and get the greatest benefit from the use of water as a cooling medium.
* VSD’s and Pressure Control: All fans, even constant volume systems, are provided with Variable Speed Drives (VSD’s). This enables building operators to tune the speed of systems and air movement without wasting energy.   
  When used properly, VSD’s can reduce energy consumption by as much as 50%...etc

## 4.4 Energy Monitoring Strategy

[Briefly discuss how energy will be monitored in the building. Provide details of the metering and sub-metering strategy to be used within the building and the locations of the energy meters and sub-meters]

**Example:**

The features of the building electrical services related to metering and monitoring include:

* Sub Metering of tenant risers at the main switchboard.
* Separate Sub Metering of Base Building sections and Tenant sections of main switchboards
* Sub metering of mechanical plant.
* Sub Metering of Lifts Services
* Sub metering at base building distribution boards to individually monitor lighting consumption and power consumption
* Sub metering at tenant floor distribution boards to individually monitor lighting consumption and power consumption.
* Sub Metering loads over 100kVA

All meters shall be linked to the BMCS for ease of monitoring and collection of data. The BMCS is designed to provide a means to centrally monitor energy and also control the designated equipment installed on the site. Training and full documentation of the BMCS interface shall be provided as part of the commissioning of this building.

In addition, there separate meters have been designed per tenant area per floor to allow tenants to meter their lighting energy use and their power energy use separately. All meters shall be connected to a BMCS which allows for the effective monitoring of energy consumption data.

# 5. Water Strategy

The building incorporates a range of initiative to reduce water demand and to use water in an efficient manner.

## 5.1 Benchmarks and targets

|  |  |
| --- | --- |
| Benchmark Water Use | [insert benchmark] L/person/day |
| Water Reduction Target |  |
| Cost savings resulting from achieving water reduction target | $ /year |

## 5.2 Description of building’s nominated systems

[Describe the nominated water related systems in the building]

## 5.3 Water Reduction Strategies

[Describe the initiatives incorporated in the design of the building to reduce water demand and to manage water efficiently during building operations. Include details of what building occupants should do to maximise benefits from the design strategies]

**Example:**

The project shall utilise high efficiency fixtures and fittings. Toilets shall be flushed with harvested rainwater.

Numerous water saving initiatives have been designed into the project including: Wash basin taps –

* 84% - FX-44/45 - WELS 6 Star sensor tap (3.5 litre/min)
* 14% - FX-50 WELS 6 Star 4.5 Litre/min
* 2% - FX-49 WELS 1 star 16 Litre/min
* 90% WCs – FX-37 WELS 4 Star 3.5 litre / flush
* 10% WCs – FX-38 WELS 4 Star 3.5 litre / flush
* 100% Urinal – FX-39 WELS 6 Star (Waterless)
* 100% Showers– WELS 3 Star (9 litre/min)

## 5.4 Water Monitoring Strategy

[Briefly discuss how water will be monitored in the building. Provide details of the metering and sub-metering strategy to be used within the building and the locations of the water meters and sub-meters]

**Example:**

Water to base building amenities, cooling towers, hot water services, rainwater collection systems and each commercial tenancy and other high water uses shall be individually metered via water sub meters and monitored by BMCS in accordance with Green Star requirements.

Maintenance procedures after practical completion include as a minimum:

* Monthly measurements and reporting of major water uses compared against predicted results in a simple to read format showing water consumption.
* As previously mentioned, metering shall be provided so that water measurements indicate separate water consumption for each floor and tenancy and for the following water uses as a minimum: domestic cold water, domestic hot water, irrigation, cooling towers, and rainwater.

# 6. Indoor Environmental Quality

People spend around 90% of their time indoors therefore providing a healthy and safe indoor environment is an important aspect of the design of this building.

|  |  |
| --- | --- |
| Indoor Environment Quality Reduction Target |  |

## 6.1 Indoor Environment Quality Reduction Strategies

[Describe the initiatives incorporated in the building to reduce and avoid exposure to VOCs, formaldehyde and other indoor pollutants. Include details of what building occupants should do to avoid exposure to indoor pollutants during the building’s operations]

**Example:**

* The building shall use of low VOC paints; and carpets and low emission formaldehyde only;
* The Building includes mould prevention measures;
* The building has designed and installed tenant exhaust risers;
* The HVAC system has been designed to have outside air rates 50% above Australian Standard requirement of 7.5 L/s/person;
* Computational Fluid Dynamics (CFD) modelling has been undertaken and demonstrates that more than 98% of the commercial office NLA will achieve an Air Change Effectiveness (ACE) greater than 0.95;
* The building has designed and installed a CO2 monitoring and control system throughout the occupied areas;
* 30% of the Net Lettable Area (NLA) has been designed to achieve a Daylight Factor of >=2% at desk level;
* Fixed shading devices as well as internal blinds for daylight glare control shall be installed on facades. Automated blinds shall be used along the north western and south western façade;
* The building shall install high frequency ballasts to all fluorescent luminaires;
* Electric Lighting levels have been designed to not exceed 400 Lux for 95% of the NLA measured at the working plane;
* Thermal comfort modelling has been undertaken and demonstrates that the PMV levels of each office NLA area are between -0.5 and +0.5 for more than 98% of the year during air conditioned hours; and
* Base building services noise levels are designed to not exceed ‘satisfactory’ noise levels in accordance with the AS/NZS 2107:2000.

## 6.2 Indoor Environment Quality Monitoring Strategy

[Briefly discuss how Indoor Environment Quality will be monitored in the building]

**Example:**

Targets for maintaining a high quality indoor environment include:

Undertaking a building tuning on a quarterly basis for the first 12 months is an effective way of monitoring fresh air rates are as per the building’s design intent.

The building will also conduct a post occupancy evaluation (POE), to have a green maintenance plan in place to ensure non-toxic materials are used for maintenance, or to use the Green Star - Performance rating tool. The Green Star - Performance rating tool's Indoor Environment Quality category assesses the following key issues:

* Thermal comfort;
* Air quality;
* Acoustic comfort;
* Lighting; and
* Office layout .

## Any other systems impacting on energy and water consumption of the building

[Provide a simple description of the heating system including the following:

* Provide a simplified diagram of the system]

### Intended Operation of the System

[Describe the intended operation of the system]

### Components and Importance of Efficient Use

[List the main components (including control) and the important of their efficient use]

### Maintenance Needs

[Detail maintenance needs, responsible parties and maintenance frequency]

### Signs of System Failure

[Outline tell-tale signs of system failure]

### System Efficiency

[Include any notes on how to maintain system efficiency]