



## **GREEN STAR – EDUCATION RATING TOOL PILOT**

### **Documentation Guidelines for new DESIGN credits**

(Similar guidelines will be produced for an As Built rating)

July 2007

Where equivalent credits already exist in Green Star – Office (Design, As-Built or Interiors) rating tools, projects must submit documentation according to ‘the letter’ of the most recent version of the Technical Manual for the same phase of the building’s life cycle (for Green Star - Education PILOT rating, use Green Star – Office Design v2 and Green Star - Office Interiors v1.1). For credits that were retained but where benchmarks may have changed to accommodate the education sector, the benchmarks in the PILOT rating tool take precedent over benchmarks in the relevant Green Star – Office rating tool and Technical Manual.

For credits that are new to the Green Star – Education PILOT rating tool, please refer to these Documentation Guidelines. Due to the nature of the PILOT process, there may be some flexibility in interpreting these guidelines, and final assessment will be left to the Certified Assessors. The knowledge gained from this will in turn determine the Compliance Requirements section of the first version of the Green Star – Education Technical Manual.

#### **Management**

##### **Man-5 ‘Building Users’ Guide’**

The following documentation is required, in addition, to demonstrate compliance:

- A copy of the Building Management Plan (BMP), demonstrating that procedures are in place and responsibility has been allocated for the proper management and running and maintenance of the building and its systems.

##### **Man-8 ‘Learning Resource’**

The following documentation is required at a minimum, to demonstrate compliance:

- A copy of excerpts from the Building Maintenance Plan, created by the design team for the Building Owner or Manager, which provide detailed guidance on accessing and maintaining the building's external building fabric and mechanical, electrical and hydraulic services (copies of equipment sheets are not equivalent to the BMP);
- A copy of the relevant specification which explains how each high-performance feature works, its environmental and economic benefits and how it exemplifies an holistic and integrated approach to sustainable design across topics such as site, water, energy, materials, and indoor environmental quality;
- Relevant documentation, such as drawings, showing the utilisation of building fabric or structure (e.g., a cutaway wall section) that shows building insulation, combined with internal and external temperature readings to demonstrate the effectiveness of the insulation;
- Specifications for easily-interpreted electricity meters at each classroom or functional area to illustrate the impact of usage, weather, or time of day, on the building’s electricity use;

- Specifications for clear pipes showing collected rainwater being transported to storage or to locations within the buildings for re-use or recycling;
- Specifications for a working renewable energy source such as photovoltaic cells or wind turbines, with a description of the technology and evidence of how live data, on the energy being generated and subsequent CO2 emissions prevented, will be displayed;
- Specifications for equipment utilising alternative heating sources such as wood fuel, solar thermal, or geothermal energy, with a description of the technology and evidence of how live data, representing the energy generated and subsequent CO2 emissions prevented, will be displayed;
- Specifications for all of the equipment utilising water from rainwater collection systems with evidence of how live readings, along with a basic description of how the technology works and its related environmental benefit, will be displayed;
- Where energy or water meters with a pulse output have been provided, the data can be displayed with a description of the system being monitored; and
- Specifications or drawings showing that the landscaping and site space(s) clearly demonstrates that an area or areas within, or adjacent to, the school boundary or in the local vicinity / region has been set aside to allow pupils to create and manage a natural habitat or wetland.

#### **Man-9 'Maintainability'**

The following documentation is required, at a minimum, to demonstrate compliance:

Regarding the nominated representative of the organisational unit responsible for the management and maintenance of the building:

- A copy of his/her professional qualification or equivalent;
- A copy of his/her letter of appointment listing the scope of works; and
- A list of the meetings and other involvement of the nominated representative in the project to date.

The Assessor(s) will not award points for this credit unless it is clear that a facilities manager with a working knowledge or experience of sustainability measures and their implications within an education or similar facility has been employed, and is a principal participant in the design team.

### **Indoor Environment Quality**

#### **IEQ-1 'Ventilation Rates'**

The following has been clarified:

Table A1 of AS1668.2 1991 sets minimum outdoor air flow rates, which equate to 12L/s/p for Primary and Secondary schools and 10L/s/p for Tertiary educational establishments.

#### **IEQ-3 'Carbon Dioxide and VOC Monitoring and Control'**

The following documentation is required to demonstrate compliance:

Mechanically Ventilated Buildings:

- Extracts from the specifications clearly describing the operation of the mechanical systems and demonstrating that these systems are not linked to automatic adjustment of outside air rates;

- A short report describing the mechanical ventilation systems in place and details of how the Credit Criteria are achieved; and
- Drawings or schematics of the design showing the proposed location of CO<sub>2</sub> and VOC sensors or ventilation system which supplies 100% outside air with no re-circulated component.

Naturally Ventilated Buildings:

- Compliance with natural ventilation requirements outlined in IEQ-1 must be demonstrated.

The Assessor(s) will not award the point unless it is demonstrated that mechanical ventilation includes CO<sub>2</sub> and VOC monitoring which meets the Credit Criteria, or 100% outside air with no re-circulated component is provided, or the building is naturally ventilated. In addition, mechanical ventilation systems and monitoring devices must be linked to the Building Management System.

#### **IEQ-4 'Daylight'**

For Primary and Secondary schools achieving a Daylight Factor of 2.5% across 90% of the UFA, the following must be demonstrated in order to achieve the additional point:

- A Daylight Modelling Report describing the software or calculation methodology and variables used for the daylight modelling and providing daylight results for each area claimed to have a Daylight Factor of minimum 4.0% across 95% of the learning space, at FFL. The Daylight Modelling Report must provide all information nominated in 'Additional Guidance';
- Copies of architectural façade and roof drawings and elevations to show the transparent façade materials in the design;
- Copies of architectural plan drawings clearly showing those areas considered to have a Daylight Factor of ≥4.0% with the NLA of each section clearly shown;
- Copies of the sections of the specification where all glazing properties and minimum visual transmittance levels are nominated; and
- A copy of the site plan in the context of the surrounding area showing heights and location of surrounding buildings and average reflectance for those buildings.

#### **IEQ-9 'Thermal Comfort'**

For the additional point mentioned within this credit to be awarded the applicant must have achieved at least one point within this credit already and also provide evidence that the base building's HVAC system was altered to meet the Credit Criteria. The following documentation is required to demonstrate compliance:

- An extract from the contract that includes the HVAC alteration scope of works; and
- Confirmation from the sub-contractor that confirms that the said works were undertaken.

#### **IEQ-10 'Hazardous Materials'**

This credit has been expanded from previously solely referring to asbestos. Refer to IEQ-11 'Asbestos' in Green Star – Office Design v2 for requirements regarding asbestos

This credit now also covers the following hazardous materials:

##### ***Lead***

Lead is most commonly found in paints. Wherever found around the project site, it must be removed in accordance with AS4361 'Guide to Lead Paint Management'.

##### ***Polychlorinated Biphenyls (PCBs)***

PCBs are most commonly found in the ballasts of fluorescent light fixtures. Wherever found, they must be removed in accordance with the ANZECC Polychlorinated Biphenyls Management Plan.

Asbestos or other hazardous materials that legally must be withheld from the general construction waste do not have to be included in the calculation for the total waste by mass.

#### **IEQ-11 'Internal Noise Levels'**

In order to fulfil the requirements in minimising disturbance from 'cross-talk', the following documentation is required to demonstrate compliance:

- Extracts from the commissioning report showing the results of noise level testing and outlining the conditions under which the tests were carried out.

It is recommended that the commissioning contract stipulates that these tests be carried out at regular points around classrooms, learning and teaching facilities.

#### **IEQ-12 'Volatile Organic Compounds'**

Regarding tables, chairs and desks, the following documentation is required to demonstrate compliance:

- Copies of VOC data sheets that detail the VOC level of each product used or installed, which points are claimed for;
- Corresponding information from the supplier(s) that quantifies the product(s) supplied; and
- Information from the sub-contractor that confirms that the product(s) supplied were used or installed in the tenancy fitout.

The Assessor(s) will not award points unless it is demonstrated that the prescribed low-VOC emission benchmarks have been met in all instances where the specified product (i.e. chair, table, desk) has been used or installed in the fitout. The applicant must also demonstrate, through documentation from the supplier, that the VOC content of the materials/finishes are within the VOC limits prescribed in the 'Additional Guidance' section and that the low-VOC emitting products were supplied and installed.

## **Energy**

#### **Ene-1 'Energy Improvement'**

Refer to the Green Star – Education Energy Calculator Guide

#### **Ene-2 'Car Park Ventilation'**

The following documentation is required at a minimum, to demonstrate compliance:

- A summary document clearly demonstrating that the claimed area of the car park meets the Credit Criteria; and
- A copy of all specifications stipulated for the relevant mode of car park ventilation.

#### ***Naturally Ventilated Car Park***

- A copy of scale architectural section and elevation drawings for each naturally ventilated space showing openings and ventilation inlets and outlets;

AND one of the following:

- A sheet listing the opening sizes and floor area for each naturally ventilated space demonstrating that the deemed-to-comply requirements of AS 1668.2-2002 are met;

OR

- Copies of all empirical calculations to be submitted to the local authorities to demonstrate compliance with AS 1668.2-2002;

OR

- A copy of the computer modelling report to be submitted to the local authorities which demonstrates that the design meets the intent of AS 1668.2-2002.

#### ***Mechanically Ventilated Car Park***

- A copy of the section of the mechanical specification clearly describing the operation of the mechanical system, including the passive supply and/or exhaust; and

- Drawings clearly illustrating the proposed location of the passive supply or exhaust provisions.

For the additional point, the following documentation is required, at a minimum, to demonstrate compliance:

- A copy of the section of the mechanical specifications clearly describing the operation of the mechanical system, and stating that the car park mechanical ventilation fans include variable-speed drives controlled by carbon monoxide monitoring;
- A short report describing the mechanical ventilation system in place and details of how the Credit Criteria are achieved; and
- Drawings or schematics of the design showing the proposed location of all CO2 sensors.

### **Ene-3 'Peak Energy Demand Reduction'**

Peak energy demand is to be calculated as follows:

- In accordance with AS3000;
- As the absolute predicted annual peak, prior to the application of a diversity or contingency factors as required for utility agreements (the value is likely to be about 30% less than that for the utility agreement); mixed-mode ventilated buildings must also take the peak as the point when all chillers are running at full capacity;
- Everything except tenant light and power must be included in assessing peak demand; and
- Assuming the 'Deemed-to-Satisfy' (as per the BCA) building fabric; this will reward projects that are able to decrease the size of chillers through more sustainable design decisions.

The Certified Assessor(s) will not award points unless it has been clearly demonstrated that the demand on the infrastructure will never exceed the threshold established by claiming this credit (i.e. that it is not within 20% of the peak demand).

To demonstrate compliance through the differential between the peak and the average demand, the total predicted energy demand of the building must not exceed 80 kWh/m<sup>2</sup>/annum (i.e. achieve five points under Ene-1 'Predicted Greenhouse Gas Emissions').

### **Ene-5 'Stairs'**

The following documentation is required at a minimum, to demonstrate compliance:

- An extract from the specification outlining the design criteria for all internal stairs demonstrating compliance with the Credit Criteria;
- Drawings showing the locations of the internal stairs within each typical floor plate, with the location of lifts or main entrance clearly identified;

AND

- Elevation drawings of the stairwell;

OR

- A Daylight Modelling Report describing the software or calculation methodology and variables used for the daylight modelling and providing daylight results for each level of the stairwell to have a Daylight Factor of at least 3.5% at FFL.

### **Ene-6 'Unoccupied Areas'**

One point is awarded where it is demonstrated that each separate enclosed space within the UFA (e.g., laboratory, classroom, tutorial space, lecture theatre) is designed to be automatically shut down or the temperature set-back (air-conditioning) when not in use.;

OR

Where it is demonstrated that the building is naturally ventilated.

### ***Mechanically Ventilated***

The following documentation is required at a minimum, to demonstrate compliance:

- An extract from the HVAC specification outlining the design criteria demonstrating compliance with the Credit Criteria, or demonstrating that the facility will automatically shut down after set periods of time of non-use.

***Naturally ventilated:***

The following documentation is required at a minimum, to demonstrate compliance:

- A copy of scale architectural sections and elevation drawings for each naturally ventilated (UFA) space showing openings and ventilation inlets and outlets;

AND one of the following:

- A sheet listing the opening sizes and floor area for each naturally ventilated space (UFA) demonstrating that the deemed-to-comply requirements of AS 1668.2-2002 are met;

OR

- Copies of all empirical calculations to be submitted to the local authorities to demonstrate compliance with AS 1668.2-2002;

OR

- A copy of the computer modelling report to be submitted to the local authorities which demonstrates that the design meets the intent of AS 1668.2-2002.

**Ene-7 'Lighting Zoning and Control'**

The following documentation is required at a minimum, to demonstrate compliance:

- The schedule of lighting fixtures indicating compliance with the Credit Criteria, including:
  - Individual switches in all individual or enclosed spaces;
  - Individually switched zones that do not exceed 100m<sup>2</sup> by total area;
  - Clearly labelled and easily accessible switching for building occupants.
- An extract from the lighting specifications outlining the automated lighting control, including occupant detection and daylight adjustment.

**Ene-8 'Efficient External Lighting'**

The following documentation is required, at a minimum, to demonstrate compliance:

- The schedule of external lighting fixtures indicating efficacy for external and outbuilding lighting of at least 50 lumens/watt (such as high- and low-pressure sodium, metal halide, induction lighting, tubular and compact fluorescent);
- An extract from the specification indicating that efficiency requirements for external lighting are not exceeded for 95% of outdoor spaces
- An extract from the specification indicating that 95% of external lights have daylight sensors which can be combined with a time switch.

For the credit to be 'Not Applicable', the following must be demonstrated:

- An extract from calculations indicating that the externally lit area requires less than 10kW total lighting.

**Ene-9 'Centralised Energy Systems'**

The following documentation is required at a minimum, to demonstrate compliance:

- Drawings and / or specifications demonstrating that the central energy system supplies at least two buildings;
- An extract from the specification outlining the design criteria for the centralised energy station, demonstrating compliance with the Credit Criteria;
- A report from the hydraulic engineer describing how water requirements for the centralised energy station will be met, including evidence demonstrating that water used for once-through cooling does not come from potable sources, and if non-potable water is to be used, confirmation that the water is at the appropriate standard as established by a relevant state authority, as well as specifications for all relevant equipment demonstrating that it does not require once-through cooling;

## **Transport**

### **Tra-2 'Fuel Efficient Transport'**

The following documentation is required, at a minimum, to demonstrate compliance:

- Drawings of all areas with car parking clearly showing the total number of small car spaces and the number of motorbike spaces being provided;
- A calculation sheet showing the number of motorbike, small car, carpool, hybrid / other alternative fuel vehicles and total number of parking spaces being provided;
- An extract from the contract documentation showing that the spaces are designed in accordance with the dimensional requirements for small spaces set out in AS/NZS 2890.1:2004;
- Evidence illustrating how the car spots will be clearly signposted and marked to distinguish their separate use from other spots; and
- Evidence of carpooling arrangements, such as an extract from the contract with the carpool company operating the scheme.

For projects claiming that this credit is 'Not Applicable' the following documentation is required:

- Drawings of all areas clearly indicating that no car spaces are being provided.

### **Tra-3 'Cyclist Facilities'**

The following documentation is required, at a minimum, to demonstrate compliance:

- Drawings showing the number and location, including distances, of bicycle racks/rails/storage facilities, as compared with student numbers for overall student levels, including peak and average occupancy;
- Where points are claimed, the number and location of shower and locker facilities;
- A copy of an extract from the specification which stipulates that bicycle storage must comply with AS 2890.3 or as defined in 'Additional Guidance' and the number of spaces to be provided;
- A copy of an extract from the specification which describes the provision of lockers and showers in accordance with this credit; and
- A brief description of the location of the bicycle facilities demonstrating that the spaces with good natural surveillance (or in a secured area) and weather protection.

The Assessor(s) will not award the additional point for visitor bicycle storage unless the following documentation is provided:

- Drawings showing the number and location of visitor bicycle racks/rails/storage facilities;
- A copy of an extract from the specification which stipulates that bicycle storage must comply with AS 2890.3 and the number of spaces to be provided; and
- A brief description of the location of the bicycle facilities demonstrating that the spaces provided are in an accessible location near a major public entrance, signposted and provided with good natural surveillance and weather protection.

### **Tra-4 'Commuting Mass Transport'**

Please refer to Tra-4 'Commuting Mass Transport' in Green Star – Office Design v2.

In addition, the following documentation is required to demonstrate compliance regarding the deemed-to-comply provision:

- Bus schedules indicating the times and routes of public or private services available, and with the capacity to accommodate at least 80% of students to and from the school at appropriate times.

### **Tra-5 'Pedestrian Routes'**

The following documentation is required at a minimum, to demonstrate compliance:

- A copy of the site plan, to scale, in context of the surrounding area showing the location of public transport nodes and other nearby amenities, with the dedicated pedestrian connection(s) clearly identified;
- Drawings or appropriate documentation of the dedicated pedestrian connections to indicate that they will be accessible and signposted; and
- An extract from the specification and drawings that describes the provision of safe night-time lighting.

## **Water**

### **Wat-3 'Landscape Irrigation Water Efficiency'**

The following documentation is required at a minimum, to demonstrate compliance regarding xeriscapes ('dry' landscaping, not requiring additional water or irrigation):

- A letter from a qualified horticulturalist confirming that the garden is a xeriscape garden;
- Extracts from the user guide and O&M manuals describing the low water use garden and its care; and
- An extract from the hydraulic specification showing that there is no permanent watering system installed.

Drawings demonstrating that over 30% of the site area meeting the above criteria is vegetated.

### **Wat-1 'Occupant Amenity - Potable Water Efficiency'**

The calculator has been revised with benchmarks appropriate to Educational facilities.

### **Wat-4 'Heat Rejection Water Consumption'**

This credit has been revised to include all heat rejection cooling systems; see Wat-4 'Cooling Tower Water Consumption' in Green star – Office Design V2

### **Wat-6 'Potable Water Use in Laboratories'**

The following documentation is required at a minimum, to demonstrate compliance:

- An extract from the specification outlining the design criteria for all laboratory equipment, demonstrating compliance with the Credit Criteria;
- A report from the hydraulic engineer describing how the water requirements for laboratory equipment will be met;
- Documentary evidence demonstrating that water used for once-through cooling does not come from potable sources, and if non-potable water is to be used, confirmation that the water is at the appropriate standard as established by a relevant state authority;
- Specifications for equipment demonstrating that it does not require once-through cooling (excluding evaporative systems).

## **Materials**

### **Mat-4 'Recycled-Content & Reused Products & Materials'**

The following documentation is required at a minimum, to demonstrate compliance:

- A copy of a documented schedule of all uses of recycled-content products and materials in the project;
- A copy of each section in the specification where the recycled-content products and materials are described with recycled content value clearly stipulated;
- A statement from the Interior Designer (DIA or IAID qualified) with supporting evidence demonstrating that the items were previously used; evidence can include:

- The final schedule of furniture, fittings and finishes
- Purchase receipts should the items have been acquired from a second hand retailer
- A removalist's inventory from the previous location of the item
- Where the specification states the item must be reused, a statement from the Interior Designer confirming that the specified item as installed on-site;
- A copy of an extract from issued contract that includes the project's total value; and
- A calculations summary sheet nominating the percentage value of the recycled-content products and materials within the project contract value, in accordance with the Credit Criteria.

#### **Mat-11 'Disassembly & Deconstruction**

The following documentation is required at a minimum, to demonstrate compliance:

- Detailed drawings of connections to demonstrate that the claimed structural framing, roofing and façade cladding systems can be disassembled;
- Manufacturers' data sheets for pre-fabricated elements, detailing the deconstruction process;
- Evidence that elements to be recovered are clearly marked to enable reuse:
  - For materials delivered to site, evidence that their inherent performance specification properties (clearly marked and correspond to deconstruction and disassembly plan) and date of manufacture; and
  - For materials fabricated on site, a copy of an extract from the contract conditions between the contractor and either the developer or the owner that stipulates that the contractor is required to mark those materials with their inherent properties and date of fabrication.
- A comprehensive Disassembly Plan to include a calculations summary sheet that illustrates that the claimed percentage of the structural framing, roofing and façade cladding systems can be recovered, and to detail how they should be recovered (indicative of order of disassembly).

Where the points are claimed, or where the credit is claimed to be 'Not Applicable', the following documentation is required to demonstrate the percentage of the total contract value that the structural framing, roofing and façade cladding systems represent:

- A copy of an extract from issued contract that includes the project's total value; and
- A copy of a statement from a quantity surveyor estimating the total cost of structural framing, roofing and façade cladding systems (including existing elements if part of refurbishment) as a proportion of the project's total contract value.

#### **Mat-7 'Flooring'**

Refer to Green Star – Office Interiors v1.1.

#### **Mat-8 'Joinery'**

Refer to Green Star – Office Interiors v1.1 ('Mat-1 Workstations) for documentation criteria regarding modularity.

#### **Mat-9 'Loose Furniture'**

Refer to Green Star – Office Interiors v1.1.

### **Emissions**

#### **Emi-3 'Refrigerant Leak Detection & Recovery'**

The following documentation is required at a minimum, to demonstrate compliance with refrigerant leak detection and recovery:

- A copy of the section of the specification where the refrigerant leak detection system(s) is detailed, and drawings showing the sensor locations. The detection system may either be an 'in-room' sensor (within an air-tight room), or an internal equipment monitoring device.

- A copy of the section of the specification that details that the refrigerant recovery system is to automatically pump down the refrigerant to the heat exchanger or storage tank (with automatically operating isolation valves) upon either detection of a leak or manual activation for each HVAC system containing refrigerants.

The Assessor(s) will not award the point for this credit unless the documented design details a leak detection and recovery system for each HVAC component containing refrigerants, as required by the Credit Criteria.

Where no refrigerants are used, achieving full credits within Emi-1 and Emi-2 is sufficient to demonstrate this credit is 'Not Applicable'

**Emi-7 'Legionella'**

Refer to Emi-8 'Cooling Towers' in Green Star – Office Design v2.