كمنترين ڤمباڠونن
KEMENTERIAN PEMBANGUNAN
BRUNEI DARUSSALAM

MINISTRY OF DEVELOPMENT

B.A.G.U.S Certification Green Building Initiative

Criteria Requirements for New Non- Residential Buildings

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1.0. BAGUS Introduction

1.1. What is BAGUS?

BAGUS (Brunei Accredited Green Unified Seal) was launched in March 2016 as a rating tool and certification scheme for Brunei which aims to be used as a 'green tool' to assess the sustainability of buildings. The criteria for new non-residential buildings (e.g. commercial including offices and retails, industrial and educational facilities) was developed and is to be utilised on projects to assess and improve their environmental attributes and ensures environmental initiatives and practices from the design, construction and operational phases of new construction of building in Brunei.

This documentation launched in January 2022 has been created to update the key criteria requirements the latest revision has been developed specifically for the Brunei tropical weather, environmental and developmental context, cultural and social needs.

1.2. Who can use BAGUS?

BAGUS will be used to assess and verify buildings for their overall environmental performance therefore helps projects to deliver a more sustainable built environment and encouraging best practices and improve market in Brunei.

BAGUS is to be read in conjunction with PBD 2015: EEC Building Guidelines which provides minimum requirements for the energy-efficient design and construction of buildings, as well as, BAGUS technical guidelines which explains the certification process and calculations on how to achieve higher scoring following each category.

Key documents:

- PBD 12 EEC: 2015: Energy Efficiency and Conservation Building Guidelines
- BAGUS Technical Guidelines

1.3. Why BAGUS?

BAGUS as a rating tool identifies the key green building needs in Brunei, by following specific criteria and minimum requirements in order to achieve National Goals for Energy Efficiency and Climate Change towards creating a sustainable development in Brunei.

BAGUS (NEW- Non Residential Building) Certification - Framework

TO ACHIEVE BAGUS CERTIFICATION AWARD

MANDATORY MINIMUM REQUIREMENTS TO MEET

ENERGY RELATED CRITERIA REQUIREMENT

(MINIMUM 30 PTS)

+

OTHER GREEN CRITERIA REQUIREMENT

(MINIMUM 20 PTS)

Optional Criteria
(Combination must total to meet 30 points)

1.1	Building Envelope – OTTV
1.2	Air-Conditioning System
1.3	Building Design and Thermal Parameters
1.4	Natural Ventilation/ Mechanical Ventilation
1.5	Artificial Lighting
1.6	Ventilation in Carparks
1.7	Ventilation in Common Areas
1.8	Lifts and Escalators
1.9	Energy Efficient Practices
1.10	Renewable Energy

Optional Criteria
(Combination must total to meet 20 points)

2.1	Water Efficient Fittings
2.2	Water Usage and Leak Detection Rainwater
2.3	Harvesting or alternative water sources from potable water
3.1	Sustainable Construction
3.2	Greenery
3.3	Environmental Management Practices
3.4	Transportation
3.5	Refrigerants
4.1	Thermal Comfort
4.2	Lighting, Visual and Acoustic Comfort
4.3	Indoor Air Quality
5.1	Green Features and Innovation

BAGUS (NEW- Non Residential Building) Certification - Minimum Requirements and Rating

B.A.G.U.S Score	B.A.G.U.S Rating
100 and above	B.A.G.U.S Platinum
85 to < 100	B.A.G.U.S Gold
70 to < 85	B.A.G.U.S Silver
50 to < 70	B.A.G.U.S Certified

Proposed Mandatory Minimum Requirements	
Provision of Overall Thermal Transmittance Value (OTTV) Calculation* Baseline for OTTV - following Singapore's GreenMark V4.1 requirements below: - Certified: 50W/m2 - GoldPlus: < 42W/m2 - Platinum: < 40W/m2	Part 1: Energy Efficiency and Conservation
Provision of EEI Calculation* Baseline: Energy Efficiency Index (EEI)) from Ministry of Energy: - Government Buildings – 175kWh/m2/year - Commercial Buildings – 255 kWh/m2/year **Provision of Energy Savings** (following Singapore's GreenMark V4.1 requirements)* - GoldPlus: 25% energy savings - Platinum: 30% energy savings	
Provision of Energy Metering: - Commercial buildings with an aggregate floor area >500 sqm shall be installed or equipped with means to facilitate the collection of energy consumption data (BCR 2014).	
Provision of Water Efficient Fittings from DWS: - Use sanitaryware under BWELS (Brunei Water Efficient Labelling Scheme)	Part 2: Water Efficiency and Conservation
Restoration of Trees on Site from Brunei Climate Change Secretariat: - Under Protokol Hijau clients or project developers are expected to follow the Guidelines for 'Remove 1: Plant 1'	Part 3: Environmental Protection & Management
Provision of land space from Town and Country Planning: - 10% of land area to be provided as green spaces	
Selection of green building products certified from ABCi: - Minimum 3 products certified by ABCI	

**Note: As stated in BCR ' A building shall be designed and constructed with energy conservation measures to reduce - {a} solar heat gain through the roof; {b) solar heat gain through the building envelope. c) air leakage through doors, windows and other openings on the building envelope. {d) energy consumption of lighting, air- conditioning and mechanical ventilation systems; and {e) energy wastage through adequate provisions of switching means.*

BAGUS (NEW- Non Residential Building) Certification – Scoring

	i) ENERGY RELATED REQUIREMENTS			
MINIMUM 30 POINTS	**Part 1: Energy Efficiency and Conservation**			**Point Allocation**
	1.1	Building Envelope – OTTV	*(A) Applicable to AC Areas*	15
	1.2	Air-Conditioning System		28
		Part 1 (A) : Max Points		**43**
	1.3	Building Design and Thermal Parameters	*(B)Applicable to Non-AC Areas*	28
	1.4	Natural Ventilation/ Mechanical Ventilation (exc carparks)		32
		Part 1 (B) : Max Points		**60**
	1.5	Artificial Lighting	*(C)Applicable All Areas - General*	10
	1.6	Ventilation in Carparks		3
	1.7	Ventilation in Common Areas		5
	1.8	Lifts and Escalators		3
	1.9	Energy Efficient Practices		14
	1.10	Renewable Energy		**10**
		Part 1 (C) : Max Points		**45**
		Part 1: Max Points		**105**

The total **Part 1: Max Points** achieved is based from pro-rated AC and Non-AC floor areas as shown below:

$$\frac{\text{Sub Total (A) x AC Floor Area}}{\text{Total Floor Area}} + \frac{\text{Sub Total (B) x Non- AC Floor Area}}{\text{Total Floor Area}} + \text{Sub-Total (C)}$$

**Note: If either Section (A) /(B) is not applicable, no prorating of areas is required for score computation.*

	ii) OTHER GREEN REQUIREMENTS		
MINIMUM 15 POINTS	**Part 2 – Water Efficiency and Conservation**		
	2.1	Water Efficient Fittings	12
	2.2	Water Usage and Leak Detection	2
	2.3	Rainwater Harvesting or alternative water source from potable water	7
		Part 2: Max Points	**21**
	Part 3 – Site Environmental Protection and Management		
	3.1	Sustainable Construction	26
	3.2	Greenery	17
	3.3	Environmental Management Practices	7
	3.4	Transportation	5
	3.5	Refrigerants	2
		Part 3: Max Points	**57**
	Part 4 – Indoor Environmental Quality		
	4.1	Thermal Comfort	2
	4.2	Lighting, Visual and Acoustic Comfort	5
	4.3	Indoor Air Quality	5
		Part 4: Max Points	**12**
	Part 5 – Other Green Features		
	5.1	Green Features and Innovation	**5**
		Part 5: Max Points	**5**

BAGUS Certification: Max Points	**200**

2.0 BAGUS (New Non-Residential Building) - Criteria

Part 1: Energy Efficiency and Conservation

1.1	OTTV	
	Refer to Part PBD 12 EEC: 2015 Part 5 Building Envelope	
	Enhance the overall thermal performance of building envelope to minimise heat gain thus reducing the overall cooling load requirement	
a)	Baseline : Maximum Permissible OTTV = 50 W/m²	2 points for every reduction of 1 W/m2 in Points scored = 100 – [2 x (OTTV)] where OTTV ≤ 50 W/m2 **(Up to 15 points)**

1.2	**Air Conditioning System**	
	Refer to Part PBD 12 EEC: 2015 Part 7 Air-conditioning Equipment **Refer to Part PBD 12 EEC: 2015 Part 6 Air-conditioning and Mechanical Ventilation (ACMV) System**	
	Encourage the use of better efficient AC equipment to minimize energy consumption. *Baseline: Min. efficiency requirement of the air- conditioning system stated in PBD12:EEC2015*	
	The systems to be considered are as follows (a)(i) Air-Conditioned Plant: • Chiller • Chilled-water pump • Condenser water pump • Cooling tower	1.45 points for every percentage improvement in the efficiency of chiller, chilled-water pump and condenser water pump. **Points scored = 1.45 x (% improvement)** 0.05 point for every percentage improvement in the performance required for cooling tower. **Points scored = 0.05 x (% improvement)** **(Up to 20 points)**
	(a)(ii) Air Distribution System : • Air handling Units (AHUs) • Fan Coil Units (FCUs)	0.5 point for every percentage improvement in the air distribution system efficiency. **Points scored = 0.5 x (% improvement)** **(Up to 5 points)**
	OR (b) Unitary Air-Conditioners/Condensing Units : • Single split Units • Multi split Units • Variable Refrigerant Volume (VRV) System	1.5 points for every % (average improvement in the efficiency of all unitary air conditioners/ condensing units. **Points scored = 1.5 x (% improvement)** **(Up to 25 points)**
	Note: Where there is a combination of centralized air-con system with unitary air-conditioned system, the computation for the points scored will only be based on the AC system with a larger aggregate capacity.	
	(c) Sensors or similar automatic control devices are used to regulate outdoor air flow rate to maintain the concentration of carbon dioxide below 1000ppm	**2 points**
	Prerequisite Requirements: Provision of permanent measuring instruments for monitoring of water cooled chilled water plant efficiency. The installed instrumentation shall have the capability to calculate a resultant plant efficiency (ie kW/RT) within 5% of its true value and in accordance with ASHRAE Guide 22 and AHRI 550/590	
	The following instrumentation and installation are also requirement to be complied with: i. Location and installation the measuring devices to meet the manufacturer's recommendation ii. Data acquisition system to have a minimum resoloution of 16bit. iii. All data logging with capability to trend at 1 minute sampling time interval	Applicable only to buildings with provision of water cooled chilled-water plant **1 point**

<table>
<tr><td>1.3</td><td colspan="2">Building Design and Thermal Parameters</td></tr>
<tr><td></td><td colspan="2">Refer to Part PBD 12 EEC: 2015 Part 4 Architectural and Passive Design Strategy</td></tr>
<tr><td>a)</td><td>Minimum direct west facing façade through building design orientation.

Note (3) : Orientation of façade that falls within the range of 22.5° N of W and 22.5° S of W will be defined as west facing facade. Core walls for lifts or staircases and toilets that are located within this range are exempted in computation.</td><td>Points scored = 15 – 0.3 x (% of west facing facade areas over total façade areas)

(Up to 10 points)

Where there is no west facing façade, the total points scored for this item will be 24 points; the Part 1.3 b(i), b(ii) and (c) as listed below will not be applicable.</td></tr>
<tr><td>b)</td><td>(i) Minimum west facing window openings.

(ii) Effective sun shading provision for windows on the</td><td>Points scored = 10 – [0.1 x (% of west facing window areas over total west facing façade areas)]

Points scored = 0.1 x (% of west facing window areas with sun shading devices over total west facing façade areas)

(Up to 10 points for Part 1.3b(i) & b(ii))</td></tr>
<tr><td>c)</td><td>Better thermal transmittance (U-value) of external west facing walls.</td><td>Points scored = 0.04 x (% of the external west facing walls areas with U value of 2 W/m2K or less over total west facing facades areas)
(Up to 4 points)</td></tr>
<tr><td>d)</td><td>Better thermal transmittance (U-value) of roof.
Baseline: U-value for roof stated below depending on the weight range of roof structure
<table>
<tr><th>Roof Weight Group</th><th>Maximum U-Value (W/m² K)</th></tr>
<tr><td>Light (Under 50 kg/m²)</td><td>0.4</td></tr>
<tr><td>Heavy (Above 50kg/m²)</td><td>0.6</td></tr>
</table></td><td>2 points for every 0.1 W/m2K reduction
(Up to 4 points)</td></tr>
</table>

<table>
<tr><td>1.4</td><td colspan="2">Natural Ventilation/ Mechanical Ventilation (excludes carparks)</td></tr>
<tr><td></td><td colspan="2">Refer to Part PBD 12 EEC: 2015 Part 4 Architectural and Passive Design Strategy</td></tr>
<tr><td>a)</td><td>Enhance building design to achieve good natural ventilation.

Proper design of building layout that utilizes prevailing wind conditions to achieve adequate cross ventilation.</td><td>10 point for every 10% of units/rooms with window openings facing north and south directions

Points scored = 1.0 x (% of units/10)
(Up to 12 points)</td></tr>
<tr><td>b)</td><td>Use of ventilation simulation software to identify the most effective building design and layout to achieve good natural ventilation.</td><td>Points can only be scored if the recommendations from ventilation simulations are implemented
(4 points)</td></tr>
<tr><td></td><td>Baseline: SS553:2009 Table 8 – Fan power limitation in mechanical ventilation systems
<table>
<tr><th colspan="2">Allowable nameplate motor power</th></tr>
<tr><td>Constant volume</td><td>Variable volume</td></tr>
<tr><td>1.7 kW/m³/s</td><td>2.4 kW/m³/s</td></tr>
</table></td><td>0.6 point for every percentage improvement in the air distribution system efficiency

Points scored = 0.6 x (% improvement)
(Up to 15 points)

1 point installation of readily accessible switch or other means for shut off or volume reduction when ventilation is not required. Examples of such devices would include timer switch control, thermostat control, duty cycle programming and CO/CO2 sensor control</td></tr>
</table>

1.5	**Artificial Lighting**	
	Refer to Part PBD 12 EEC: 2015 Part 6 Lighting	
	Encourage the use of better efficient lighting to minimize energy consumption from lighting usage while maintaining proper lighting level. Baseline = Maximum lighting power budget stated in PBD12:EEC2015	0.5 point for every percentage improvement in lighting Points scored = 0.5 x (% improvement) **(Up to 10 points)**

1.6	Natural Ventilation in Carparks	
	Refer to Part PBD 12 EEC: 2015 Part 4 Architectural and Passive Design Strategy	
c)	Ventilation in Carparks: Encourage the use of energy efficient design and control of ventilation systems in carparks. (a) Carparks designed with natural ventilation. (b) CO sensors are used to regulate the demand for mechanical ventilation (MV). Note (4) : Where there is a combination of different ventilation modes adopted for carpark design, the points obtained will be prorated accordingly.	Naturally ventilated carparks – 3 points Points scored based on the mode of mechanical ventilation provided Fume extract – 2 points MV with or without supply – 1 points **(Up to 3 points)**

1.7	Ventilation in Common Areas	
	Refer to Part PBD 12 EEC: 2015 Part 4 Architectural and Passive Design Strategy	
d)	Ventilation in Common Areas: Encourage the use of energy efficient design and control of ventilation systems in the following common areas : a) Toilets b) Staircases c) Corridors d) Lift Lobbies **e)** Atrium	Extent of Coverage: At least 90 % of each applicable area Points scored based on the mode of ventilation provided in the applicable areas Natural ventilation – 1.5 points for each area Mechanical ventilation – 0.5 point for each area **(Up to 5 points)**

1.8	Lifts and Escalators	
	Encourage the use of efficient lifts and escalators. Extent of Coverage : All lifts and/or escalators	
a)	Lifts with the following energy efficient features : (i) AC variable voltage and variable frequency (VVVF) motor drive or equivalent (ii) (Sleep mode features or equivalent.	1 point 1 point
b)	Escalators with energy efficient features such as motion sensors	1 point

1.9	Energy Efficient Practices and Features	
	Encourage the use of energy efficient practices and features which are innovative and have positive environmental impact.	
a)	Computation of energy consumption based on design load in the form of energy efficiency index (EEI). Baseline: EEI shall comply with benchmark **EEI Benchmark (Entry Level) for Brunei Buildings:** **Commercial Buildings: 255 kwh/sqm/yr.** ***Reference from Ministry of Energy*** **EEI < 255 = 2 points** **EEI < 235 = 3 points** **EEI < 215 = 4 points** **EEI < 195 = 5 points** **EEI < 175 = 6 points** **EEi < 155 = 7 points** **EEi < 135 = 8 points**	**(Up to 8 points)**
b)	Use of energy efficient features such as: • Motion sensors for stair landing • Use of Energy Management System/ Metering to monitor and analyse energy consumption	3 points for every 1% energy saving over the total building energy consumption **(Up to 6 points)**

1.10	Renewable Energy	
	Encourage the application of renewable energy sources and low carbon technologies in buildings	
a)	The minimum renewable energy percentage for each point threshold is as follows: Percentage replacement of Building Electricity Consumption by renewable energy 1% - 1 point 3% - 2 points 5% - 3 points 7% - 4 points 9% - 5 points 11% - 6 points 13% - 7 points Utilization of on-site Energy Storage system (1 point) BIPV / Solar Roof Tiles (2 points)	**(Up to 10 points)**

Part 2: Water Efficiency and Conservation

2.1	**Water Efficient Fittings**	
	Encourage the use of water efficient fittings that are certified under the Brunei Water Efficient Products Labelling Scheme (BWELS) *Points scored based on the number and water efficiency rating of the fitting type used.*	<table><tr><th>WATER FITTING</th><th>GOOD</th><th>V. GOOD</th><th>EXCELLENT</th></tr><tr><td>Basin Taps</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Sink Taps</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Bib Taps</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Water Closet (Flushing Cistern)</td><td>1</td><td>2</td><td>3</td></tr></table> Points scored are based on the type of water fitting used. If there is more than one model of a type of water fitting, an average rating should be used (Up to 12 points)

2.2	Water Usage and Leak Detection	
	Promote the use of sub-metering and leak detection system for better control and monitoring.	
a)	Provision of sub-meters for major water uses including automatic irrigation, cooling tower and fountains	1 point
b)	Provision of flow controller or a pressure reducing valve to control the flow or water pressure in the building	1 point

2.3	**<u>Rainwater Harvesting or alternative water source from potable water</u>**	
	Provision of suitable systems that utilise harvested rainwater or alternative sources of water to reduce treated water consumption for the following items:	
a)	(a) Landscape watering/gardening and outdoor cleaning activities through standpipes outside the building	1 point
b)	Use of water efficient irrigation system**.** Extent of Coverage: At least 50% of the landscape areas are served by the system	Extent of Coverage: At least 50% of the landscape areas are served by the system 50% - 1 point 100% - 2 points (Up to 2 points)
c)	Supply water to toilet flushing cisterns inside the building	2 points
d)	Supply water to a cooling tower	2 points

Part 3: Environmental Protection and Management

<table>
<tr><td>3.1</td><td colspan="2">Sustainable Construction</td></tr>
<tr><td></td><td colspan="2">Encourage the adoption of building designs, construction practices and materials that are environmentally friendly and sustainable.</td></tr>
<tr><td>a)</td><td>(i) More efficient concrete usage for building components.</td><td><table><tr><th>Project CUI (m^3/m^2)</th><th>Points Allocation</th></tr><tr><td>≤ 0.70</td><td>1 point</td></tr><tr><td>≤ 0.60</td><td>2 points</td></tr><tr><td>≤ 0.50</td><td>3 points</td></tr><tr><td>≤ 0.40</td><td>4 points</td></tr><tr><td>≤ 0.35</td><td>5 points</td></tr></table>(Up to 5 points)</td></tr>
<tr><td></td><td>(ii) Products certified by ABCi under raw materials for concrete (e.g sand, stone, clay, etc)</td><td>1 point for each product
(Cap at 4 points)</td></tr>
<tr><td>b)</td><td>Conservation of existing building structure - Applicable to existing structural elements or building envelope.</td><td>Extent of Coverage :
Conserve at least 50 % of the existing structural elements or building envelope (by area)
1 point</td></tr>
<tr><td>c)</td><td>Use of sustainable materials and products in building construction such as:

(i) Environmentally friendly products that have valid Green Label certification (SGLS/SGBC/Green Listing) recognized by ABCi</td><td>1 point for high impact item
0.5 point for low impact item
(Cap at 8 points)</td></tr>
<tr><td></td><td>(ii) Products with at least 30% by weight or volume (applicable only to non-structural elements).</td><td>1 point for high impact item
0.5 point for low impact item
(Cap at 4 points)</td></tr>
<tr><td></td><td>(iii) Products certified by ABCi under Scheme 5 (Local Products)</td><td>2 point for each product
(Cap at 4 points)</td></tr>
<tr><td></td><td colspan="2">Note (5) : For products that are certified under SGLS and with at least 30% recycled contents, points can only be scored either from Part 3.1(c)(i) or (c)(ii)
Each Products can only be scored under one category in Part 3.1 (c) (i) (ii) (iii)</td></tr>
</table>

3.2	Greenery	
	Encourage greater use of greenery, restoration of trees to reduce heat island effect.	
a)	Green Space Calculation (under TCP) (Area of green space provided and retained out of total land area)	1 point = 10% 2 point = 15% 3 point = 20% 4 point = 25% 5 point = 30% 6 point > 35% (Max 6 points)
b)	Restoration of trees on site, conserving or relocating of existing trees on site. *Mandatory follow the guidelines: Remove 1 plant, Plant 1 For 1 existing tree cut, replant 4 tree – 2 points For 1 existing tree cut, replant 8 tree – 4 points For 1 existing tree cut, replant 16 tree – 6 points	(Max 6 points)
c)	Use of compost recycled from horticulture waste.	1 point
d)	Install a vegetated roof for at least 50% of the roof area	1 point
e)	Vertical greenery on the east and west façade	2 point for more than 30% of east and west façade areas 1 point for more than 15% of east and west façade areas (Max 2 point)
f)	Provison of water scape at development parameters	1 point

3.3	Environmental Management Practice	
	Encourage the adoption of environmental friendly practices during construction and building operation.	
a)	Implement effective environmentally friendly programmes including monitoring and setting targets to minimise energy use, water use and construction waste	1 point
b)	Project team comprises any green building certified professional (e.g. GreenMark Manager/ Professional, Green Building Index Facilitatior, LEED Accredited Professional, BAGUS)	Green Mark AP / GBI Facilitator / LEED AP, BAGUS -2 points
c)	Provision of building users' guide including details of the environmental friendly facilities and features within the building and their uses in achieving the intended environmental performance during building operation.	1 point
d)	Provision of facilities or recycling bins for collection and storage of different recyclable waste such as paper, glass, plastic etc (registered recycling vendors with MOD to be selected)	1 point
e)	Use of BIM (e.g. REVIT) for collaboration between various parties and through the use of clash detection software to help project run more smoothly.	1 point
g)	Use of integrative process worksheet (involvement of all parties and record of discussion from early stage of project in regards to the energy, water, green features to be implemented and appointement of consultants	1 point

3.4	Transportation	
	Encourage to improve transportation with use of green vehicles and discourage overprovision of car parking capacity	
a)	Transportation Impact Analysis	1 point
b)	Provision of preferred parking for Electric Vehicles (Low Emitting & Fuel Efficient) charging stations within the development	1 point
c)	Provision parking for preferred parking or carpools lots	1 point
d)	Provision of covered pedestrian connectivity to surrounding developments or public transport	1 point
e)	Provision of other modes of transportation such as bicycle lane or parking, shuttle bus, park and ride facilities and etc.	1 point
	Note: Preferred parking" refers to the parking spots that are closest to the main entrance of the project (exclusive of spaces designated for handicapped or parking passes provided at a discounted price)	

3.5	Refrigerants	
	Reduce the potential damage to the ozone layer and the increase in global warming through the release of ozone depleting substances and greenhouse gases	
a)	(a) Refrigerants with ozone depletion potential (ODP) of zero or with global warming potential (GWP) of less than 100.	1 point
b)	(b) Use of refrigerant leak detection system at critical areas of plant rooms containing chillers and other equipment with refrigerants	1 point

Part 4: Indoor Environmental Quality

4.1	**Thermal Comfort**	
	Encourage the adoption of building designs, construction practices and materials that are environmentally friendly and sustainable.	
a)	Air-conditioning system is designed to allow for cooling load variations due to fluctuations in ambient air temperature to ensure consistent indoor conditions for thermal comfort. Indoor temp between 23 to 25° C Relative Humidity < 70%	2 points

4.2	Lighting, Visual and Acoustic Comfort	
	Improve noise levels of occupied spaces	
a)	Occupied spaces in buildings are designed with good ambient sound levels as recommended in SS CP 13. Sound Level Measurements Verification: 1 point	(Up to 2 Points)
b)	Improve workplace lighting quality by avoiding low frequency flicker associated with fluorescent lighting with use of high frequency ballasts in the fluorescent luminaries. Applicable to offices, classrooms and similar room areas must meet requirements as stated in PBD: EEC Guidelines Lighting Lux Measurements Verification: 1 point	(Up to 2 Points)
c)	Use of quality views to promote wellbeing through use of nature and greenery	1 points

4.3	Indoor Air Quality	
	Minimise airborne contaminants, mainly from inside sources to promote a healthy indoor environment.	
a)	Use of products that have low volatile organic compounds (VOC) which are certified under Green Label (e.g. Singapore Green Labeling Scheme) and certified under ABCi (applicable to at least 90% of area) i. Paints ii. Sealants	1 point each (Up to 2 Points)
b)	Ensure AHUs or dedicated outdoor air units are designed to accommodate fine dust filters of least a rating of Minimum Efficiency Reporting Value (MERV) 14 (ASHRAE 52.2: 2012) or F8 (EN779: 2012),	1 point
c)	Create IAQ Management Plan and verification stage - conduct IAQ (Indoor Air Quality) Testing/ Audit at least one year after occupancy	1 point
d)	Conduct Post Occupancy Survey to monitor Indoor Comfort of Building Users	1 point

Part 5: Other Green Features and Innovations

5.1	Green Features and Innovations	
	Encourage the use of other green features which are innovative and have positive environmental impact	
a)	Examples (Reference from GreenMark and GBi): • Central pneumatic waste collection system • Dual chute system • Self-cleaning façade system • Solar water heating technologies • Infiltration trenches • Integrated storm water retention/treatment into landscaping • Condensate water recovery (accounting for at least 50% of total AHUs/FCUs) for use as cooling tower make-up water etc; • Co-generation / Tri-generation system; • Thermal / PCM / Thermal Mass storage system (accounting for at least 25% of total required capacity); • Solar thermal technology / Solar Airconditioners (generating at least 10% of total required capacity); • Heat recovery system (contributing to at least 10% of total required capacity); • Light pipes; • Auto-condenser tube cleaning system (fitted to plant equipment serving at least 50% of total capacity); • Non-chemical water treatment system (serving at least 50% of total capacity); • Mixed mode / low energy ventilation system; • Advanced air filtration technology (serving at least 50% of the NLA); • Waterless urinals (fitted to all male toilets); • Central vacuum system (serving at least 50% of NLA); • Electrochromic glazed façade; • Refrigerant leakage detection and recycling facilities; • Recycling of all fire system water during regular testing;	2 points for high impact item 1 point for medium impact item 0.5 point for low impact item (Up to 5 points)