GBI ASSESSMENT CRITERIA
FOR
NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

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INTRODUCTION

WHAT IS THE GREEN BUILDING INDEX (GBI)?

The Green Building Index is an environmental rating system for buildings developed by PAM (Pertubuhan Arkitek Malaysia / Malaysian Institute of Architects) and ACEM (the Association of Consulting Engineers Malaysia). The Green Building Index is Malaysia's first comprehensive rating system for evaluating the environmental design and performance of Malaysian buildings based on the six (6) main criterias of Energy Efficiency, Indoor Environment Quality, Sustainable Site Planning & Management, Materials & Resources, Water Efficiency, and Innovation.

The Green Building Index is developed specifically for the Malaysian tropical weather, environmental and developmental context, cultural and social needs.

The GBI initiative aims to assist the building industry in its march towards sustainable development. The GBI environmental rating system is created to:

- **Define green buildings by establishing a common language and standard of measurement;**
- **Promote integrated, whole-building design;**
- **Recognise and reward environmental leadership;**
- **Transform the built environment to reduce it's environmental impact; and**
- **Ensure new buildings remain relevant in the future and existing buildings are refurbished and upgraded properly to remain relevant.**

WHO CAN USE THE GREEN BUILDING INDEX?

GSB encourages all members of Project Teams, Building owners, Developers and other interested parties (including Contractors, Government and Design & Build Contractors) to use the Green Building Index to validate environmental initiatives at the design phase of new construction or base building refurbishment; or construction and procurement phase of buildings. Use of the Green Building Index is encouraged on all such projects to assess and improve their environmental attributes.

Use of the Green Building Index tool without formal certification by an independent accredited GBI Certifier does not entitle the user or any other party to promote the Green Building Index rating achieved. No fee is payable to GSB for such use, however formal recognition of the Green Building Index rating - and the right to promote same - requires undertaking the formal certification process offered by Greenbuildingindex Sdn Bhd.

All Green Building Index rating tools are reviewed annually; please forward any feedback to info@greenbuildingindex.org

PROJECT INFORMATION

PROJECT NAME	
PROJECT ADDRESS	
POSTCODE	
STATE	

APPLICANT	
CONTACT PERSON	

ARCHITECT	
CIVIL ENGINEER	
STRUCTURAL ENGINEER	
MECHANICAL ENGINEER	
ELECTRICAL ENGINEER	
QUANTITY SURVEYOR	
LAND SURVEYOR	
LANDSCAPE CONSULTANT	
OTHER SPECIALIST CONSULTANT(S)	
MAIN CONTRACTOR	
LOCAL AUTHORITY	
TOTAL GROSS FLOOR AREA	
LAND AREA FOR LANDED PROPERTY	

BUILDING DESCRIPTION	

ASSESSMENT CRITERIA
OVERALL POINTS SCORE

PART	ITEM	MAXIMUM POINTS	SCORE
1	Energy Efficiency	35	
2	Indoor Environmental Quality	21	
3	Sustainable Site Planning & Management	16	
4	Material & Resources	11	
5	Water Efficiency	10	
6	Innovation	7	
	TOTAL SCORE	100	

GREEN BUILDING INDEX CLASSIFICATION

POINTS	GBI RATING
86+ points	Platinum
76 to 85 points	Gold
66 to 75 points	Silver
50 to 65 points	Certified

ASSESSMENT CRITERIA SCORE SUMMARY

PART	CRITERIA	ITEM	POINTS	TOTAL
1	**EE**	**ENERGY EFFICIENCY**		
	Design			35
	EE1	Minimum EE Performance	1	
	EE2	Lighting Zoning	3	
	EE3	Electrical Sub-metering	1	
	EE4	Renewable Energy	5	
	EE5	Advanced EE Performance - BEI	15	
	Commissioning			
	EE6	Enhanced Commissioning	3	
	EE7	Post Occupancy Commissioning	2	
	Verification & Maintenance			
	EE8	EE Verification	2	
	EE9	Sustainable Maintenance	3	
2	**EQ**	**INDOOR ENVIRONMENTAL QUALITY**		
	Air Quality			21
	EQ1	Minimum IAQ Performance	1	
	EQ2	Environmental Tobacco Smoke (ETS) Control	1	
	EQ3	Carbon Dioxide Monitoring and Control	1	
	EQ4	Indoor Air Pollutants	2	
	EQ5	Mould Prevention	1	
	Thermal Comfort			
	EQ6	Thermal Comfort: Design & Controllability of Systems	2	
	EQ7	Air Change Effectiveness	1	
	Lighting, Visual & Acoustic Comfort			
	EQ8	Daylighting	2	
	EQ9	Daylight Glare Control	1	
	EQ10	Electric Lighting Levels	1	
	EQ11	High Frequency Ballasts	1	
	EQ12	External Views	2	
	EQ13	Internal Noise Levels	1	
	Verification			
	EQ14	IAQ Before & During Occupancy	2	
	EQ15	Post Occupancy Comfort Survey: Verification	2	

PART	CRITERIA	ITEM	POINTS	TOTAL
3	**SM**	**SUSTAINABLE SITE PLANNING & MANAGEMENT**		
	Site Planning			16
	SM1	Site Selection	1	
	SM2	Brownfield Redevelopment	1	
	SM3	Development Density & Community Connectivity	2	
	SM4	Environment Management	2	
	Construction Management			
	SM5	Earthworks - Construction Activity Pollution Control	1	
	SM6	QLASSIC	1	
	SM7	Workers' Site Amenities	1	
	Transportation			
	SM8	Public Transportation Access	1	
	SM9	Green Vehicle Priority	1	
	SM10	Parking Capacity	1	
	Design			
	SM11	Stormwater Design – Quantity & Quality Control	1	
	SM12	Greenery & Roof	2	
	SM13	Building User Manual	1	
4	**MR**	**MATERIALS & RESOURCES**		
	Reused & Recycled Materials			11
	MR1	Materials reuse and selection	2	
	MR2	Recycled content materials	2	
	Sustainable Resources			
	MR3	Regional Materials	1	
	MR4	Sustainable Timber	1	
	Waste Management			
	MR5	Storage & Collection of recyclables	1	
	MR6	Construction waste management	2	
	Green Products			
	MR7	Refrigerants & Clean Agents	2	
5	**WE**	**WATER EFFICIENCY**		
	Water Harvesting & Recycling			10
	WE1	Rainwater Harvesting	2	
	WE2	Water Recycling	2	
	Increased Efficiency			
	WE3	Water Efficient - Irrigation/Landscaping	2	
	WE4	Water Efficient Fittings	2	
	WE5	Metering & Leak Detection System	2	
6	**IN**	**INNOVATION**		
	IN1	Innovation in Design & Environmental Design Initiatives	6	7
	IN2	Green Building Index Accredited Facilitator	1	
			TOTAL POINTS	**100**

1 ENERGY EFFICIENCY (EE)

DESIGN | COMMISSIONING | VERIFICATION & MAINTENANCE

35 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
DESIGN				
EE1	**MINIMUM EE PERFORMANCE**			
	Establish minimum energy efficiency (EE) performance to reduce energy consumption in buildings, thus reducing CO_2 emission to the atmosphere. Meet the following minimum EE requirements as stipulated in MS 1525:2007: 1) OTTV ≤ 50, RTTV ≤ 25. Submit calculations using the BEIT software or other GBI approved software(s), ***AND*** 2) Provision of Energy Management Control system where Air-conditioned space ≥ 4000m²	1	**1**	
EE2	**LIGHTING ZONING**			
	Provide flexible lighting controls to optimise energy savings:		**3**	
	All individual or enclosed spaces to be individually switched; and the size of individually switched lighting zones shall not exceed 100m² for 90% of the NLA; with switching clearly labelled and easily accessible by building occupants.	1		
	Provide auto-sensor controlled lighting in conjunction with daylighting strategy for all perimeter zones and daylit areas, if any.	1		
	Provide motion sensors or equivalent to complement lighting zoning for at least 25% NLA.	1		
EE3	**ELECTRICAL SUB-METERING & TENANT SUB-METERING**			
	Monitor energy consumption of key building services as well as all tenancy areas: Provide sub-metering for all energy uses of ≥ 100kVA; with separate sub-metering for lighting and separately for power at each floor or tenancy, whichever is smaller.	1	**1**	
EE4	**RENEWABLE ENERGY**			
	Encourage use of renewable energy:		**5**	
	Where 0.5 % or 5 kWp whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	2		
	Where 1.0 % or 10 kWp whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	3		
	Where 1.5 % or 20 kWp whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	4		
	Where 2.0 % or 40 kWp whichever is the greater, of the total electricity consumption is generated by renewable energy	5		
EE5	**ADVANCED EE PERFORMANCE**			
	Exceed Energy Efficiency (EE) performance better than the baseline minimum to reduce energy consumption in the building. Achieve Building Energy Intensity (BEI) ≤ 150 kWh/m²yr as defined under GBI reference (using BEIT Software or other GBI approved software(s)), ***OR***	2	**15**	
	BEI ≤ 140, ***OR***	3		
	BEI ≤ 130, ***OR***	5		
	BEI ≤ 120, ***OR***	8		
	BEI ≤ 110, ***OR***	10		
	BEI ≤ 100, ***OR***	12		
	BEI ≤ 90	15		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
COMMISSIONING				
EE6	**ENHANCED COMMISSIONING OF BUILDING ENERGY SYSTEMS**			
	Ensure building's energy related systems are designed and installed to achieve proper commissioning so as to realise their full potential and intent. Appoint an independent GBI recognised Commissioning Specialist (CxS) at the onset of the design process to verify that comprehensive pre-commissioning and commissioning is performed for all the building's energy related systems in accordance with ASHRAE Commissioning Guideline or other GBI approved equivalent standard/s by: 1. Conducting at least one commissioning design review during the detail design stage and back-check the review comments during the tender documentation stage. 2. Developing and incorporating commissioning requirements into the tender documents. 3. Developing and implementing a commissioning plan. 4. Verifying the installation and performance of the systems to be commissioned. 5. Reviewing contractor submittals applicable to systems being commissioned for compliance. 6. Developing a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems. 7. Verifying that the requirements for training operating personnel and building occupants are completed.	3	**3**	
EE7	**POST OCCUPANCY COMMISSIONING**			
	Carry out post occupancy commissioning for all tenancy areas after fit-out changes are completed:		**2**	
	1) Design engineer shall review all tenancy fit-out plans to ensure original design intent is not compromised and upon completion of the fit-out works, verify and fine-tune the installations to suit.	1		
	2) Within 12 months of practical completion (or earlier if there is at least 50% occupancy), the CxS shall carry out a full post/re-commissioning of the building's energy related systems to verify that their performance is sustained in conjunction with the completed tenancy fit-outs.	1		
VERIFICATION & MAINTENANCE				
EE8	**EE VERIFICATION**			
	Verify predicted energy use of key building services: 1) Use Energy Management System to monitor and analyse energy consumption including reading of sub-meters, ***AND*** 2) Fully commission EMS including Maximum Demand Limiting programme within 12 months of practical completion (or earlier if there is at least 50% occupancy).	2	**2**	
EE9	**SUSTAINABLE MAINTENANCE**			
	Ensure the building's energy related systems will continue to perform as intended beyond the 12 months Defects & Liability Period:		**3**	
	1) At least 50% of permanent building maintenance team to be on-board one (1) to three (3) months before practical completion and to fully participate (to be specified in contract conditions) in the Testing & Commissioning of all building energy services.	1		
	2) Provide for a designated building maintenance office that is fully equipped with facilities (including tools and instrumentation) and inventory storage. 3) Provide evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget (inclusive of staffing and outsourced contracts).	2		
	ENERGY EFFICIENCY (EE) TOTAL		**35**	

2 INDOOR ENVIRONMENTAL QUALITY (EQ)

AIR QUALITY | THERMAL COMFORT | LIGHTING, VISUAL & ACOUSTIC COMFORT | VERIFICATION

21 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
AIR QUALITY				
EQ1	**MINIMUM IAQ PERFORMANCE**			
	Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in building, thus contributing to the comfort and well-being of the occupants: Meet the minimum requirements of ventilation rate in ASHRAE 62.1:2007 or the local building code whichever is the more stringent.	1	**1**	
EQ2	**ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL**			
	Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS): Prohibit smoking in the building, ***AND*** Locate any exterior designated smoking areas at least 10m away from entries, outdoor air intakes and operable windows	1	**1**	
EQ3	**CARBON DIOXIDE MONITORING AND CONTROL**			
	Provide response monitoring of carbon dioxide levels to ensure delivery of minimum outside air requirements: Install carbon dioxide (CO_2) monitoring and control system with at least one (1) CO_2 sensor at all main return points on each floor to facilitate continuous monitoring and adjustment of outside air ventilation rates to each floor, and ensure independent control of ventilation rates to maintain CO_2 level ≤ 1,000ppm	1	**1**	
EQ4	**INDOOR AIR POLLUTANTS**			
	Reduce detrimental impact on occupant health from finishes that emit internal air pollutants:		**2**	
	Use low VOC paint and coating throughout the building. Paints and Coatings to comply with requirements specified in international labelling schemes recognized by GBI, ***AND*** Use low VOC carpet or flooring throughout the building. Carpets to comply with requirements specified in international labelling schemes recognized by GBI. Other types of flooring to comply with requirements under FloorScore developed by Science Certification System or equivalent, ***AND*** Use low VOC adhesive and sealant or no adhesive or sealant used.	1		
	Use products with no added urea formaldehyde. These include: 1) Composite wood and agrifiber products defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores, ***AND*** 2) Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies, ***AND*** 3) Insulation foam, ***AND*** 4) Draperies	1		
EQ5	**MOULD PREVENTION**			
	Design system(s) which reduce the risk of mould growth and its associated detrimental impact on occupant health: Where it is demonstrated that the mechanical air-conditioned ventilation system will maintain a positive indoor air pressure relative to the exterior and can actively control indoor air humidity to be no more than 70% RH without the use of active control that will consume additional energy. Ensure that excessive moisture in building is controlled during the Design, Construction and Operation stages by the consideration and the control of the following: 1) Rainwater leakage through roof and walls 2) Infiltration of moist air 3) Diffusion of moisture through walls, roof and floors 4) Groundwater intrusion into basements and crawl spaces through walls and floors 5) Leaking or burst pipes 6) Indoor moisture sources 7) Construction moisture ***OR*** The building is fully naturally ventilated	1	**1**	

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
THERMAL COMFORT				
EQ6	**THERMAL COMFORT: DESIGN & CONTROLLABILITY OF SYSTEMS**			
	Provide a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces to promote the productivity, comfort and well-being of building occupants:		**2**	
	Design to ASHRAE 55 in conjunction with the relevant localised parameters as listed in MS1525:2007.	1		
	Provide individual comfort controls for ≥ 50% of the building occupants to enable adjustments to suit individual task needs and preferences. ***AND*** Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences. *Conditions for thermal comfort include the primary factors of air temperature, radiant temperature, air speed and humidity. Comfort system control for this purpose is defined as the provision of control over at least one of these primary factors in the occupants' local environment.*	1		
EQ7	**AIR CHANGE EFFECTIVENESS**			
	Provide effective delivery of clean air through reduced mixing with indoor pollutants in order to promote a healthy indoor environment. Demonstrate that the Air Change Effectiveness (ACE) meets the following criteria for at least 90% of the NLA: The ventilation systems are designed to achieve an ACE of ≥ 0.95 when measured in accordance with ASHRAE 129-1997: Measuring air change effectiveness where ACE is to be measured in the breathing zone (nominally 1.0m from finished floor level)	1	**1**	
LIGHTING, VISUAL & ACOUSTIC COMFORT				
EQ8	**DAYLIGHTING**			
	Provide good levels of daylighting for building occupants:		**2**	
	Demonstrate that ≥ 30% of the NLA has a daylight factor in the range of 1.0 – 3.5% as measured at the working plane, 800mm from floor level, ***OR***	1		
	Demonstrate that ≥ 50% of the NLA has a daylight factor in the range of 1.0 – 3.5% as measured at the working plane, 800mm from floor level	2		
EQ9	**DAYLIGHT GLARE CONTROL**			
	Reduce discomfort of glare from natural light. Where blinds or screens are fitted on all glazing and atrium as a base building, incorporate provisions to meet the following criteria: 1) Eliminate glare from all direct sun penetration and keep horizontal workspace lux level below 2,000; 2) Eliminate glare from diffuse sky radiation for occupant workspace at viewing angles of 15° to 60° from the horizontal at eye level (typically 1.2m from floor level) 3) Control with an automatic monitoring system (for atrium and windows with incident direct sun light only - not applicable for fixed blinds/screens); ***AND*** 4) Equip with a manual override function accessible by occupants (not applicable for fixed blinds/screens)	1	**1**	
EQ10	**ELECTRIC LIGHTING LEVELS**			
	Baseline building office lighting not to be over designed: Demonstrate that office lighting design maintains a luminance level of no more than specified in MS1525:2007 for 90% of NLA as measured at the working plane (800mm above the floor level).	1	**1**	
EQ11	**HIGH FREQUENCY BALLASTS**			
	Increase workplace amenity by avoiding low frequency flicker that may be associated with fluorescent lighting: Install high frequency ballasts in fluorescent luminaaires over a minimum of 90% of NLA.	1	**1**	
EQ12	**EXTERNAL VIEWS**			
	Reduce eyestrain for building occupants by allowing long distance views and provision of visual connection to the outdoor.		**2**	
	Demonstrate that ≥ 60% of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.	1		
	Demonstrate that ≥ 75% of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.	2		
EQ13	**INTERNAL NOISE LEVELS**			
	Maintain internal noise levels at an appropriate level. Demonstrate that 90% of the NLA do not exceed the following ambient internal noise levels: Within the entire baseline building general office, space noise from the building services does not exceed 40dBAeq. ***OR*** Within the baseline building office space, the sound level does not exceed 45dBAeq for open plan and not exceed 40dBAeq for closed offices	1	**1**	

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
VERIFICATION				
EQ14	**IAQ BEFORE & DURING OCCUPANCY**			
	Reduce indoor air quality problems resulting from the construction process in order to help sustain the comfort and well-being of building occupants. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the Pre-Occupancy phase as follows: 1) Perform a building flush out by supplying outdoor air to provide not less than 10 airchanges/hour for at least 30 minutes operation before occupancy and continuous minimum 1 ACH during the initial 14 days occupancy of the completed building ***OR*** 2) If low VOC materials and low formaldehyde composite wood are used, then building flush out can be performed by supplying outdoor air to provide not less than 10 airchanges/hour for at least 15 minutes operation or not less than 6 airchanges/hour for at least 30 minutes operation and continuous 1ACH during the initial 7 days occupancy of the completed building ***OR*** 3) Within 12 months of occupancy, conduct IAQ testing to demonstrate maximum concentrations for pollutants are not exceeded according to the Indoor Air Quality Code of Malaysia.	1	**2**	
	During Occupancy Stage: Where a permanent air flushing system of at least 10 airchanges/hour operation is installed for use during occupancy stage	1		
EQ15	**POST OCCUPANCY COMFORT SURVEY: VERIFICATION**			
	Provide for the assessment of comfort of the building occupants: Conduct a post-occupancy comfort survey of building occupants within 12 months after occupancy/ building completion. This survey should collect anonymous responses about thermal comfort, visual comfort and acoustic comfort in a building. It should include an assessment of overall satisfaction with thermal, visual and acoustic performance and identification of thermal-related, visual-related and acoustic-related problems. ***AND*** Develop a plan for corrective action if the survey results indicate that more than 20% of occupants are dissatisfied with the overall comfort in the building. This plan should include measurement of relevant environmental variables in problem areas. *The relevant environmental variables include 1) Temperature, relative humidity, air speed and mean radiant temperature, 2) Lighting level and glare problem, 3) Background noise level, 4) Odour problem, CO_2 level, VOCs, and particulate concentration*	2	**2**	
	INDOOR ENVIRONMENTAL QUALITY (EQ) TOTAL		**21**	

3 SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SITE PLANNING | CONSTRUCTION MANAGEMENT | TRANSPORTATION | DESIGN

16 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
SITE PLANNING				
SM1	**SITE SELECTION**			
	Do not develop building, hardscape, road or parking area on a site or part of a site that meet any one of the following criteria: 1. Prime farmland as defined by the Structure Plan of the area or the National Physical Plan. 2. Forest reserve or State Environmental Protection Zones that is specifically identified as habitat for any species found on the endangered lists. 3. Within 30m of any wetlands as defined by the Structure Plan of the area ***OR*** within setback distances from wetlands prescribed in state or local regulations, as defined by local or state rule or law, whichever is more stringent. 4. Previously undeveloped land that is within 30m of Mean High Water Spring (MHWS) sea level which supports or could support wildlife or recreational use, or statutory requirements whichever is the more stringent. 5. Previously undeveloped land that is within 20m of lake, river, stream and tributary which support or could support wildlife or recreational use. 6. Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is provided.	1	**1**	
SM2	**BROWNFIELD REDEVELOPMENT**			
	Reduce pressure on undeveloped land by rehabilitating damaged sites where development is complicated by environmental contamination, thereby reducing pressure on undeveloped land. This would typically involve old rubbish tips, former mining land, old factory sites, etc.	1	**1**	

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
SM3	**DEVELOPMENT DENSITY & COMMUNITY CONNECTIVITY**			
	Channel development to urban area with existing infrastructure, protect greenfield and preserve habitat and natural resources:		**2**	
	A) DEVELOPMENT DENSITY Construct a new building or renovate an existing building on a previously developed site ***AND*** in a community with a minimum density of 20,300m^2 per hectare net (87,000 sqft per acre net)	1		
	B) COMMUNITY CONNECTIVITY Construct a new building or renovate an existing building on a previously developed site ***AND*** within 1km of a residential zone or neighbourhood with an average density of 25 units per hectare net (10 units per acre net) ***AND*** within 1km of at least 10 Basic Services ***AND*** with pedestrian access between the building and the services. *Basic Services include, but are not limited to:* *1) Bank; 2) Place of Worship; 3) Convenience / Grocery; 4) Day Care; 5) Police Station; 6) Fire Station; 7) Beauty; 8) Hardware; 9) Laundry; 10) Library; 11) Medical / Dental; 12) Senior Care Facility; 13) Park; 14) Pharmacy; 15) Post Office; 16) Restaurant; 17) School; 18) Supermarket; 19) Theatre; 20) Community Centre; 21) Fitness Centre.* *Proximity is determined by drawing a 1km radius around the main building entrance on a site map and counting the services found within that radius.*	1		
SM4	**ENVIRONMENT MANAGEMENT**			
	A) Conserve existing natural area and restore damaged area to provide habitat and promote biodiversity & B) Maximize Open Space by providing a high ratio of open space to development footprint to promote biodiversity:		**2**	
	A) CONSERVATION On previously developed or graded site, restore or protect a minimum of 50% of the site area (excluding the building footprint) with native or adaptive vegetation. Native or adaptive plants are plants indigenous to a locality or cultivars of native plants that are adapted to the local climate and are not considered invasive species or noxious weeds. Applicable also to landscaping on rooftops and roof gardens so long as the plants meet the definition of native or adaptive vegetation. ***OR*** On greenfield sites, limit all site disturbance to within 12m beyond the building perimeter; 3m beyond surface walkway, patio, surface parking and utilities less than 300mm in diameter; 4.5m beyond primary roadway curb and main utility branch trench; and 7.5m beyond constructed area with permeable surface (such as pervious paving area, storm water detention facility and playing field) that require additional staging area in order to limit compaction in the constructed area.	1		
	B) OPEN SPACE: Reduce by 25%, the development footprint (defined as the total area of the building footprint, hardscape, access road and parking) and/or provide vegetated open space within the project boundary to exceed the local zoning's open space requirement for the site by 25%. ***OR*** For areas with no local zoning requirement (e.g. university campus, military bases), provide vegetated open space adjacent to the building whose area is equal to that of the building footprint. ***OR*** Where a zoning ordinance exists, but there is no requirement for open space (zero), provide vegetated open space equal to 20% of the project's site area.	1		
CONSTRUCTION MANAGEMENT				
SM5	**EARTHWORKS - CONSTRUCTION ACTIVITY POLLUTION CONTROL**			
	Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation. Create and implement an Erosion and Sedimentation Control (ESC) Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the approved Earthworks Plans OR Local erosion and sedimentation control standards and codes, whichever is the more stringent. The plan shall describe the measures implemented to accomplish the following objectives: 1. Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse. 2. Prevent sedimentation of storm sewer or receiving stream. 3. Prevent polluting the air with dust and particulate matter.	1	**1**	
SM6	**QLASSIC - QUALITY ASSESSMENT SYSTEM FOR BUILDING CONSTRUCTION WORK**			
	Achieve quality of workmanship in construction works: Subscribe to independent method to assess and evaluate quality of workmanship of building project based on CIDB's CIS 7: Quality Assessment System for Building Construction Work (QLASSIC). Must achieve a minimum score of 70%	1	**1**	
SM7	**WORKERS' SITE AMENITIES**			
	Reduce pollution from construction activities by controlling pollution from waste and rubbish from workers. Create and implement a Site Amenities Plan for all construction workers associated with the project. The plan shall describe the measures implemented to accomplish the following objectives: 1. Proper accommodation for construction workers at the site or at temporary rented accommodation nearby. 2. Prevent pollution of storm sewer or receiving stream by having proper septic tank. 3. Prevent polluting the surrounding area from open burning and proper disposal of domestic waste. 4. Provide adequate health and hygiene facilities for workers on site.	1	**1**	

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
TRANSPORTATION				
SM8	**PUBLIC TRANSPORTATION ACCESS**			
	Reduce pollution and land development impacts from automobile use: Locate project within 1km of an existing, or planned and funded, commuter rail, light rail or subway station. ***OR*** Locate project within 500m of at least one bus stop.	1	**1**	
SM9	**GREEN VEHICLE PRIORITY - LOW EMITTING & FUEL EFFICIENT VEHICLES**			
	Encourage use of green vehicles: Provide low-emitting and fuel-efficient vehicles for 5% of Full-Time Equivalent (FTE) occupants ***AND*** provide preferred parking for these vehicles. *"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).*	1	**1**	
SM10	**PARKING CAPACITY**			
	Discourage over-provision of car parking capacity: Size parking capacity to meet, but not to exceed the minimum local zoning requirements, ***AND*** provide preferred parking for carpools or vanpools for 5% of the total provided parking spaces.	1	**1**	
DESIGN				
SM11	**STORMWATER DESIGN – QUANTITY & QUALITY CONTROL**			
	Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing storm water runoff. Reduce or eliminate water pollution by reducing impervious cover, increasing onsite infiltration, eliminating sources of contaminants, and removing pollutants from storm water runoff: ***CONDITION 1:*** **IF EXISTING IMPERVIOUSNESS IS ≤ 50%:** Implement a storm water management plan that prevents the post development peak discharge rate and quantity from exceeding the pre-development peak discharge rate and quantity in conformance to the Storm Water Management Manual for Malaysia (MASMA). ***CONDITION 2:*** **IF EXISTING IMPERVIOUSNESS IS > 50%:** Implement a storm water management plan that results in a 25% decrease in the volume of storm water runoff required under MASMA. For either Condition, implement a storm water management plan that reduces impervious cover, promotes infiltration, and captures and treats the storm water runoff from 90% of the average annual rainfall using acceptable best management practices (BMPs).	1	**1**	
SM12	**GREENERY & ROOF**			
	Reduce heat island (thermal gradient difference between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat:		**2**	
	A) HARDSCAPE & GREENERY APPLICATION Provide any combination of the following strategies for 50% of the site hardscape (including sidewalks, courtyards, plazas and parking lots): 1) Shade (within 5 years of occupancy); 2) Paving materials with a Solar Reflectance Index (SRI) of at least 29; 3) Open grid pavement system;	1		
	B) ROOF APPLICATION 1) Use roofing material with a Solar Reflectance Index (SRI) equal to or greater than the value in the table below for a minimum of 75% of the roof surface; ***OR*** 2) Install a vegetated roof for at least 50% of the roof area; ***OR*** 3) Install high albedo and vegetated roof surfaces that, in combination, meet the following criteria: *(Area of SRI Roof / 0.75) + (Area of vegetated roof / 0.5) ≥ Total Roof Area* *Roof Type Slope SRI* *Low-Sloped Roof < 2:12 78* *Steep-Sloped Roof > 2:12 29*	1		
SM13	**BUILDING USER MANUAL**			
	Document Green building design features and strategies for user information and guide to sustain performance during occupancy: Provide a Building User Manual which documents passive and active features that should not be downgraded.	1	**1**	
	SUSTAINABLE SITE PLANNING & MANAGEMENT (SM) TOTAL		**16**	

4 MATERIALS & RESOURCES (MR)

REUSED AND RECYCLED MATERIALS | SUSTAINABLE RESOURCES | CONSTRUCTION MANAGEMENT | GREEN PRODUCTS

11 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
REUSED AND RECYCLED MATERIALS				
MR1	**MATERIALS REUSE AND SELECTION**			
	Reuse building materials and products to reduce demand for virgin materials and reduce creation of waste. This serves to reduce environmental impact associated with extraction and processing of virgin resources. Integrate building design and its buildability with selection of reused building materials, taking into account their embodied energy, durability, carbon content and life cycle costs:		2	
	Where reused products/materials constitutes ≥ 2% of the project's total material cost value, ***OR***	1		
	Where reused products/materials constitutes ≥ 5% of the project's total material cost value	2		
MR2	**RECYCLED CONTENT MATERIALS**			
	Increase demand for building products that incorporate recycled content materials in their production: *(Recycled content shall be defined in accordance with the International Organization of Standards Document)*		2	
	Where use of materials with recycled content is such that the sum of post-consumer recycled plus one-half of the pre-consumer content constitutes ≥ 10% (based on cost) of the total value of the materials in the project, ***OR***	1		
	Where use of materials with recycled content is such that the sum of post-consumer recycled plus one-half of the pre-consumer content constitutes at least 30% (based on cost) of the total value of the materials in the project.	2		
SUSTAINABLE RESOURCES				
MR3	**REGIONAL MATERIALS**			
	Use building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation: Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500km of the project site for ≥ 20% (based on cost) of the total material value. *Mechanical, electrical and plumbing components shall not be included. Only include materials permanently installed in the project.*	1	1	
MR4	**SUSTAINABLE TIMBER**			
	Encourage environmentally responsible forest management: Where ≥ 50% of wood-based materials and products used are certified. *These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. To include wood materials permanently installed and also temporarily purchased for the project. Compliance with Forest Stewardship Council and Malaysian Timber Certification Council requirements.*	1	1	
WASTE MANAGEMENT				
MR5	**STORAGE & COLLECTION OF RECYCLABLES**			
	Facilitate reduction of waste generated during construction and during building occupancy that is hauled and disposed of in landfills: During Construction, provide dedicated area/s and storage for collection of non-hazardous materials for recycling, ***AND*** During Building Occupancy, provide permanent recycle bins.	1	1	
MR6	**CONSTRUCTION WASTE MANAGEMENT**			
	Develop and implement a construction waste management plan that, as a minimum identifies the materials to be diverted from disposal regardless of whether the materials will be sorted on site or co-mingled. Quantify by measuring total truck loads of waste sent for disposal:		2	
	Recycle and/or salvage ≥ 50% volume of non-hazardous construction debris, ***OR***	1		
	Recycle and/or salvage ≥ 75% volume of non-hazardous construction debris.	2		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
GREEN PRODUCTS				
MR7	**REFRIGERANTS & CLEAN AGENTS**			
	Use environmentally-friendly Refrigerants and Clean Agents exceeding Malaysia's commitment to the Montreal & Kyoto protocols:		**2**	
	Use zero Ozone Depleting Potential (ODP) products: non-CFC and non-HCFC refrigerants/clean agents;	1		
	Use non-synthetic (natural) refrigerants/clean agents with zero ODP and negligible Global Warming Potential.	1		
	MATERIALS & RESOURCES (MR) TOTAL		**11**	

5 WATER EFFICIENCY (WE)

WATER HARVESTING & RECYCLING | INCREASED EFFICIENCY

10 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
WATER HARVESTING & RECYCLING				
WE1	**RAINWATER HARVESTING**			
	Encourage rainwater harvesting that will lead to reduction in potable water consumption:		**2**	
	Rainwater harvesting that leads to ≥ 15% reduction in potable water consumption, ***OR***	1		
	Rainwater harvesting that leads to ≥ 30% reduction in potable water consumption	2		
WE2	**WATER RECYCLING**			
	Encourage water recycling that will lead to reduction in potable water consumption:		**2**	
	Treat and recycle ≥ 10% wastewater leading to reduction in potable water consumption, ***OR***	1		
	Treat and recycle ≥ 30% wastewater leading to reduction in potable water consumption	2		
INCREASED EFFICIENCY				
WE3	**WATER EFFICIENT - IRRIGATION/LANDSCAPING**			
	Encourage the design of system that does not require the use of potable water supply from the local water authority:		**2**	
	Reduce potable water consumption for landscape irrigation by ≥ 50% (e.g. through use of native or adaptive plants to reduce or eliminate irrigation requirement, ***OR***	1		
	Do not use potable water at all for landscape irrigation	2		
WE4	**WATER EFFICIENT FITTINGS**			
	Encourage reduction in potable water consumption through use of efficient devices:		**2**	
	Reduce annual potable water consumption by ≥ 30%, ***OR***	1		
	Reduce annual potable water consumption by ≥ 50%	2		
WE5	**METERING & LEAK DETECTION SYSTEM**			
	Encourage the design of systems that monitors and manages water consumption:		**2**	
	Use of sub-meters to monitor and manage major water usage for cooling towers, irrigation, kitchens and tenancy use	1		
	Link all water sub-meters to EMS to facilitate early detection of water leakage	1		
	WATER EFFICIENCY (WE) TOTAL		**10**	

6 INNOVATION (IN)

INNOVATION INITIATIVES & GBI FACILITATOR

7 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
IN1	**INNOVATION IN DESIGN & ENVIRONMENTAL DESIGN INITIATIVES**			
	Provide design team and project the opportunity to be awarded points for exceptional performance above the requirements set by GBI rating system: ***1 point for each approved innovation and environmental design initiative up to a maximum of 6 points, such as:*** • 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); • Heat pipe technology; • 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); • Central Pneumatic Waste Collection system; • Self-cleaning façade; • Electrochromic glazed façade; • Refrigerant leakage detection and recycling facilities; • Recycling of all fire system water during regular testing;	6	**6**	
IN2	**GREEN BUILDING INDEX FACILITATOR**			
	To support and encourage the design integration required for Green Building Index rated buildings and to streamline the application and certification process: At least one principal participant of the project team shall be a Green Building Index Facilitator who is engaged at the onset of the design process until completion of construction and Green Building Index certification is obtained.	1	**1**	
		INNOVATION (IN) TOTAL	**7**	