NON-RESIDENTIAL NEW CONSTRUCTION (NRNC): RESORT

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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 fundamentally derived from existing international rating tools, including the Singapore Green Mark and the Australian Green Star system, but extensively modified for relevance to the Malaysian tropical weather, environmental context, cultural and social needs.

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

- **Define green building 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 the environmental impact of development; and**
- **ensure new buildings remain relevant in the future and existing buildings are refurbished properly to remain relevant.**

WHO CAN USE THE GREEN BUILDING INDEX (NON-RESIDENTIAL)?

PAM/ACEM encourage all members of Project Teams, Building owners, Developers and other interested parties (including Contractors, Government and Design and Build Contractors) to use the Green Building Index to validate environmental initiatives of the design phase of new non-residential construction or base non-residential building refurbishment; or construction and procurement phase of non-residential 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 (Non-Residential) 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 PAM/ACEM 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 PAM/ACEM.

Whilst GBI NRNC is a generic rating tool for Office Buildings, GBI NRNC: RESORT is a bespoke rating tool developed for Resort Hotels.

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

PROJECT INFORMATION

PROJECT NAME		
PROJECT REGISTRATION NO.		
PROJECT ADDRESS		
	POSTCODE	STATE
CONSTRUCTION TYPE		
TOTAL GROSS FLOOR AREA (GFA)		
LAND AREA (FOR LANDED PROPERTY)		
REGISTRATION FEE (EXCLUDING GST)		
TARGETTED RATING		
TOTAL POINTS CLAIM		
EXPECTED CONSTRUCTION DATE	COMMENCED	COMPLETION
DATE BUILDING COMPLETED (NREB/IEB ONLY)		
PROJECT DESCRIPTION & MAJOR DESIGN FEATURES		

CONSULTANTS INFORMATION

OWNER'S NAME		
COMPANY		
OWNER'S REPRESENTATIVE	NAME	DESIGNATION

ARCHITECT	NAME	PROFESSIONAL REG. NO.	COMPANY
CIVIL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
STRUCTURAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
MECHANICAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
ELECTRICAL ENGINEER	NAME	PROFESSIONAL REG. NO.	COMPANY
QUANTITY SURVEYOR	NAME	PROFESSIONAL REG. NO.	COMPANY
LAND SURVEYOR	NAME	PROFESSIONAL REG. NO.	COMPANY
LANDSCAPE ARCHITECT	NAME	PROFESSIONAL REG. NO.	COMPANY
COMMISSIONING SPECIALIST (CxS)	NAME	PROFESSIONAL REG. NO.	COMPANY
GBI FACILITATOR	NAME	PROFESSIONAL REG. NO.	COMPANY
OTHER SPECIALIST CONSULTANT(S)			
MAIN CONTRACTOR			
LOCAL AUTHORITY			

DETAIL ASSESSMENT CRITERIA
SUMMARY OF FINAL SCORE

PART	ITEM	MAXIMUM POINTS	SCORE
1	Energy Efficiency (EE)	35	
2	Indoor Environmental Quality (EQ)	16	
3	Sustainable Site Planning & Management (SM)	15	
4	Material & Resources (MR)	13	
5	Water Efficiency (WE)	12	
6	Innovation (IN)	9	
	TOTAL SCORE	100	

GREEN BUILDING INDEX CLASSIFICATION:

POINTS	GBI RATING
86 to 100 points	Platinum
76 to 85 points	Gold
66 to 75 points	Silver
50 to 65 points	Certified

DETAIL ASSESSMENT CRITERIA
SUMMARY OF CONTENTS

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			16
	EQ1	Minimum IAQ Performance	1	
	EQ2	Environmental Tobacco Smoke (ETS) Control	1	
	EQ3	Indoor Air Pollutants	2	
	EQ4	Mould Prevention	1	
	Thermal Comfort			
	EQ5	Air Movement for Comfort	1	
	EQ6	Thermal Comfort: Design & Controllability of Systems	2	
	Lighting, Visual & Acoustic Comfort			
	EQ7	Daylighting	2	
	EQ8	Electric Lighting Levels	1	
	EQ9	High Frequency Ballasts	1	
	EQ10	Internal Noise Levels	1	
	Verification			
	EQ11	IAQ Before Occupancy	1	
	EQ12	Post Occupancy Comfort Survey: Verification	2	

PART	CRITERIA	ITEM	POINTS	TOTAL
3	**SM**	**SUSTAINABLE SITE PLANNING & MANAGEMENT**		
	Site Planning			15
	SM1	Site Selection	1	
	SM2	Redevelopment fo Existing Site & Brownfield	1	
	SM3	Community Connectivity	1	
	SM4	Environment Management	3	
	Construction Management			
	SM5	Earthworks - Construction Activity Pollution Control	1	
	SM6	QLASSIC	1	
	SM7	Workers' Site Amenities	1	
	Transportation			
	SM8	Resort Guests Transportation - Green Vehicle	1	
	SM9	Staff Mobility	1	
	Design			
	SM10	Stormwater Design – Quantity & Quality Control	1	
	SM11	Greenery & Roof	2	
	SM12	Building User Manual	1	
4	**MR**	**MATERIALS & RESOURCES**		
	Reused & Recycled Materials			13
	MR1	Materials reuse and selection	3	
	MR2	Recycled content materials	3	
	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			12
	WE1	Rainwater Harvesting	3	
	WE2	Water Recycling	3	
	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	8	9
	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 (MANDATORY COMPLIANCE)**			
	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:		1	
	a) OTTV ≤ 50, RTTV ≤ 25, Roof U-Value ≤ 0.4 (Light weight) or ≤ 0.6 (Heavy weight). Submit calculations (use of the BEIT software or other GBI approved software is acceptable), ***AND*** b) Provision of Energy Management Control system where Air-conditioned space ≥ 4000 m^2	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 30m^2; with switching clearly labelled and easily accessible. Guestrooms to be provided with multi-light switches.	1		
	Provide auto-sensor controlled lighting in conjunction with daylighting strategy for all perimeter zones and daylit areas, including external corridors/compounds, common areas, porch etc.	1		
	Provide motion or occupancy sensors or equivalent to complement lighting zoning equivalent to at least 25% NLA. For guestroom, master switch or access card switch or equiv to switch off all lights, fan, tv and airconditioning when room is not occupied will qualify as occupancy sensor.	1		
EE3	**ELECTRICAL SUB-METERING**			
	Monitor energy consumption of key building services as well as major Resort facilities:-		1	
	Provide sub-metering for all energy uses ≥ 100kVa and demonstrate suitability of metering for energy monitoring and improvement. (There shall be a minimum of 3 sub-meters for the 3 biggest energy components).	1		
EE4	**RENEWABLE ENERGY**			
	Encourage use of renewable energy:-		5	
	Where 0.5 % or 5 kWp (PV or equiv) whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	2		
	Where 1.0 % or 10 kWp (PV or equiv) whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	3		
	Where 1.5 % or 20 kWp (PV or equiv) whichever is the greater, of the total electricity consumption is generated by renewable energy, ***OR***	4		
	Where 2.0 % or 40 kWp (PV or equiv) 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) as defined by GBI for the following corresponding credit points. The default operating hours for Resort is 24/7. Non-electricity fuel energy is excluded in the BEI calculation.		15	
	BEI ≤ 245, ***OR***	2		
	BEI ≤ 230, ***OR***	3		
	BEI ≤ 212, ***OR***	5		
	BEI ≤ 196, ***OR***	8		
	BEI ≤ 181, ***OR***	10		
	BEI ≤ 165, ***OR***	12		
	BEI ≤ 148	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 areas where fit-out (changes) are undertaken.		**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:-		**2**	
	1. Use Energy Management System (or have a dedicated Energy Management Team) to monitor and analyse energy consumption including reading of sub-meters.	1		
	2. Fully commission EMS including Maximum Demand Limiting programme within 12 months of practical completion (or earlier if there is at least 50% occupancy), ***OR***	1		
	Where EMS is not provided and air-conditioned area is < 4,000m^2, the dedicated Energy Management Team to demonstrate EE operational strategy.			
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		
	EE SUB-TOTAL	**35**	**35**	**0**

2 INDOOR ENVIRONMENTAL QUALITY (EQ)

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

16 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:-		1	
	Meet the minimum requirements of ventilation rate in ASHRAE 62.1 or the local building code whichever is the more stringent.	1		
EQ2	**ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL**			
	Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS):-		1	
	Prohibit smoking in airconditioned premises, ***AND*** Locate any exterior designated smoking areas at least 10m away from entries, outdoor air intakes and operable windows so as not to contaminate airconditioned space.	1		
EQ3	**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: a) Composite wood and agrifiber products defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores, ***AND*** b) Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies, ***AND*** c) Insulation foam, ***AND*** d) Draperies	1		
EQ4	**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: i) Rainwater leakage through roof and walls ii) Infiltration of moist air iii) Diffusion of moisture through walls, roof and floors iv) Groundwater intrusion into basements and crawl spaces through walls and floors v) Leaking or burst pipes vi) Indoor moisture sources vii) Construction moisture ***OR*** The building is fully naturally ventilated	1	1	
THERMAL COMFORT				
EQ5	**AIR MOVEMENT FOR COMFORT**			
	Provide air movement for indoor comfort and to reduce airconditioning use in guestrooms:-		1	
	For guestrooms, provide ceiling fan and contact switch at balcony door/window to switch off airconditioner unit when relevant door/window is opened to prevent wastage of conditioned air.	1		
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 standards in conjunction with the relevant localised parameters in MS1525.	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		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
LIGHTING, VISUAL & ACOUSTIC COMFORT				
EQ7	**DAYLIGHTING**			
	Provide good levels of daylighting for building occupants:-		**2**	
	Demonstrate that ≥ 30% of Back-of-the-House (BOTH) and common areas have 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 BOTH and common areas have a daylight factor in the range of 1.0 – 3.5% as measured at the working plane, 800mm from floor level.	2		
EQ8	**ELECTRIC LIGHTING LEVELS**			
	Baseline building lighting not to be over designed:-		**1**	
	Demonstrate that lighting designs for different spaces of the building maintain luminance levels of no more than specified in MS1525 for 90% of NLA.	1		
EQ9	**HIGH FREQUENCY BALLASTS**			
	Increase workplace amenity by avoiding low frequency flicker that may be associated with fluorescent lighting:-		**1**	
	Install high frequency ballasts for at least 90% of all fluorescent luminaires used.	1		
EQ10	**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:-		**1**	
	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. *Note that internal noise level thresholds for areas other than office space shall not exceed values stipulated in ASHRAE Standard or other GBI approved Standards, Code of Practice or Design Guides; e.g. CIBSE Guide.*	1		
VERIFICATION				
EQ11	**IAQ BEFORE 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	**1**	
EQ12	**POST OCCUPANCY COMFORT SURVEY: VERIFICATION**			
	Provide for the assessment of comfort of the building occupants:-		**2**	
	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		
	EQ SUB-TOTAL	**16**	**16**	**0**

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3 SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SITE PLANNING | CONSTRUCTION MANAGEMENT | TRANSPORTATION | DESIGN

15 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**	
	a) Prime farmland as defined by the Structure Plan of the area or the National Physical Plan. b) Forest reserve or State Environmental Protection Zones that is specifically identified as habitat for any species found on the endangered lists. c) Within 30 m 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. d) Previously undeveloped land that is within 30 m 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. e) Previously undeveloped land that is within 20 m of lake, river, stream and tributary which support or could support wildlife or recreational use. f) Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is provided.	1		
SM2	**REDEVELOPMENT OF EXISTING SITE & BROWNFIELD**			
	Discourage development in environmentally sensitive areas. Encourage redevelopment of existing sites. Reward rehabilitation of Brownfield site.		**1**	
	Redevelopment , refurbishment ***OR*** extension of existing buildings ***OR*** sites ***OR*** rehabilitation of brownfield site.	1		
SM3	**COMMUNITY CONNECTIVITY**			
	Reduce pollution due to transportation by having within 3 km of the Resort (or within the Resort), at least 5 of the following Basic Services. Basic Services include, but are not limited to: 1) Place of Worship; 2) Convenience / Grocery; 3) Day Care; 4) Fire Station/Beat; 5) Beauty; 6) Library; 7) School *Proximity is determined by drawing a 3 km radius around the main building entrance on a site map and counting the services found within that radius.*	1	**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:-		**3**	
	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 12 m beyond the building perimeter; 3 m beyond surface walkway, patio, surface parking and utilities less than 300 mm in diameter; 4.5 m beyond primary roadway curb and main utility branch trench; and 7.5 m 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%(1 point) or 50%(2 points), 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. ***OR*** For areas with no local zoning requirement, provide vegetated open space adjacent to the building whose area is equal to 100%(1 point) or 200%(2 points) 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 25%(1 point) or 50%(2 points) of the project's site area.	2		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
CONSTRUCTION MANAGEMENT				
SM5	**EARTHWORKS - CONSTRUCTION ACTIVITY POLLUTION CONTROL**			
	Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation:-		**1**	
	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: a) Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse. b) Prevent sedimentation of storm sewer or receiving stream. c) Prevent polluting the air with dust and particulate matter.	1		
SM6	**QLASSIC - QUALITY ASSESSMENT SYSTEM FOR BUILDING CONSTRUCTION WORK**			
	Achieve quality of workmanship in construction works:-		**1**	
	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		
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:-		**1**	
	The plan shall describe the measures implemented to accomplish the following objectives: a) Proper accommodation for construction workers at the site or at temporary rented accommodation nearby. b) Prevent pollution of storm sewer or receiving stream by having proper septic tank. c) Prevent polluting the surrounding area from open burning and proper disposal of domestic waste. d) Provide adequate health and hygiene facilities for workers on site.	1		
TRANSPORTATION				
SM8	**RESORT GUESTS' TRANSPORTATION - GREEN VEHICLE**			
	Use of only green vehicles for guests' transport (e.g. airport/port transfer or transportation hubs) and for movement of guests within the resort (such as electric buggies and trishaws).	1	**1**	
SM9	**STAFF MOBILITY - PROVISION OF GREEN TRANSPORTATION**			
	Provide bicycles and/or other forms of non motorised or green transportation for staff movement within the resort.	1	**1**	
DESIGN				
SM10	**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 (MSMA). ***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 MSMA. 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**	

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
SM11	**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 1) Provide any combination of the following strategies for 50% of the site hardscape (including sidewalks, courtyards, plazas and parking lots): a) Shade (within 5 years of occupancy); b) Paving materials with a Solar Reflectance Index (SRI) of at least 29; c) 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		
SM12	**BUILDING USER MANUAL**			
	Document Green building design features and strategies for user information and guide to sustain performance during occupancy:-	1	**1**	
	Provide a Building User Manual which documents passive and active features that should not be downgraded (including housekeeping SOP).			
	SM SUB-TOTAL	**15**	**15**	**0**

4 MATERIALS & RESOURCES (MR)

REUSED & RECYCLED MATERIALS | SUSTAINABLE MATERIALS & RESOURCES AND POLICY | WASTE MANAGEMENT | GREEN PRODUCTS

13 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:-		3	
	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, ***OR***	2		
	Where reused products/materials constitutes ≥ 10% of the project's total material cost value	3		
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)*		3	
	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		
	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 50% (based on cost) of the total value of the materials in the project.	3		
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:-		1	
	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		
MR4	**SUSTAINABLE TIMBER**			
	Encourage environmentally responsible forest management:-		1	
	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 Malaysian Timber Certification Scheme or Forest Stewardship Council requirements.	1		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
WASTE MANAGEMENT				
MR5	**STORAGE & COLLECTION OF RECYCLABLES**			
	Facilitate reduction of waste generated during construction and during building occupancy that is hauled and disposed off in landfills:-		**1**	
	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		
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		
GREEN PRODUCTS				
MR7	**REFRIGERANTS & CLEAN AGENTS**			
	Use environmentally-friendly Refrigerants and Fire Suppression 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 ***AND*** fire suppression clean agents;	1		
	Use non-synthetic (natural) refrigerants ***AND*** fire suppression clean agents with zero ODP and negligible Global Warming Potential of ≤10.	1		
	MR SUB-TOTAL	**13**	**13**	**0**

5 WATER EFFICIENCY (WE)

WATER HARVESTING & RECYCLING | INCREASED EFFICIENCY

12 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:-		3	
	Rainwater harvesting that leads to ≥ 15% reduction in potable water consumption, ***OR***	1		
	Rainwater harvesting that leads to ≥ 30% reduction in potable water consumption, ***OR***	2		
	Rainwater harvesting that leads to ≥ 75% reduction in potable water consumption.	3		
WE2	**WATER RECYCLING**			
	Encourage rainwater harvesting that will lead to reduction in potable water consumption:-		3	
	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, ***OR***	2		
	Treat and recycle ≥ 50% wastewater leading to reduction in potable water consumption.	3		
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		
	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 (including faucets, washing equipment, etc.):-		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 or have a dedicated Energy Management Team to facilitate early detection of water leakage.	1		
	WE SUB-TOTAL	**12**	**12**	**0**

6 INNOVATION (IN)

INNOVATION IN DESIGN & ENVIRONMENTAL DESIGN INITIATIVES | GREEN BUILDING INDEX FACILITATOR

9 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 8 points, such as (refer to GBI website for updates and details); • Condensate water recovery (accounting for at least 50% of total AHUs/FCUs) for use e.g., as cooling tower make-up water etc; • Solar thermal technology / Solar Airconditioners (generating at least 10% of total required capacity); • Innovative Kitchen Grease & Waste Disposal; • Educational Sorting centre for recycleables; • Beach Erosion Maintenance; • Rehabilitation of unsuitable sandy soil for greenery; • Environmental activities promotion; • Staff eco-awareness training programmes; • Environmental effluent control; • ISO14001 practice with dedicated Sustainable Team; • Use of eco-friendly products (bio-degradable soap, shampoo and cleaning agents) throughout resort; • Solar hot water heaters for at least 90% of guestrooms.	8	**8**	
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:-		**1**	
	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		
	IN SUB-TOTAL	**9**	**9**	**0**