



GBI ASSESSMENT CRITERIA

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

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INTRODUCTION

WHAT IS THE GREEN BUILDING INDEX (GBI)?

The Green Building Index (GBI) is Malaysia's recognised green rating tool for buildings and townships, jointly developed by PAM (Pertubuhan Arkitek Malaysia) and ACEM (Association of Consulting Engineers Malaysia). As Malaysia's pioneering comprehensive environmental rating system, GBI evaluates the sustainability performance of buildings based on six (6) core criteria: Energy Efficiency, Indoor Environmental Quality, Sustainable Site Planning & Management, Materials & Resources, Water Efficiency, and Innovation.

Developed specifically for Malaysia's tropical climate, environmental conditions, developmental priorities, and socio-cultural context, GBI provides a practical and locally relevant framework for advancing sustainable development within the built environment.

The GBI initiative supports the transformation of the building industry towards a more sustainable, resilient, and low-carbon future. The GBI environmental rating system aims to:

- **Define green building by establishing a common language and standard of measurement;**
- **Promote integrated, whole-building design;**
- **Recognise and encourage leadership in environmental sustainability and innovation;**
- **Transform the built environment to reduce the environmental impact of development; and**
- **Ensure that both new and existing buildings remain sustainable, adaptable and future-ready through responsible development, refurbishment and long-term asset management.**

WHO CAN USE THE GREEN BUILDING INDEX TOOL?

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 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 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.

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

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	Materials & Resources	11	
5	Water Efficiency	10	
6	Innovation	7	
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

ASSESSMENT CRITERIA

PREREQUISITE

PART	CATEGORY	ITEM CODE	PREREQUISITE ITEM	REQUIREMENT
EE	Energy Efficiency	P-EE1	Minimum Energy Efficiency (EE) Performance	Meet the following minimum EE requirements as stipulated in local building code and MS 1525: 1) OTTV $\leq 50 \text{ W/m}^2$ AND 2) RTTV $\leq 25 \text{ W/m}^2$ OR Lightweight Roof U-Value $\leq 0.4 \text{ W/m}^2\text{K}$ OR Heavyweight Roof U-Value $\leq 0.6 \text{ W/m}^2\text{K}$ AND 3) Provision of Energy Management Control (EMCS) system where Air-conditioned space $\geq 4000\text{m}^2$
		P-EE5	Advanced EE Performance - BEI	Achieve Building Energy Intensity (BEI) of not more than 180 kWh/m ² /year.
		P-EE9(1)	Sustainable Maintenance	Provide for a designated building maintenance office that is fully equipped with facilities (including tools and instrumentation) and inventory storage.
EQ	Indoor Environmental Quality	P-EQ2	Environmental Tobacco Smoke (ETS) Control	Prohibit smoking in the building and locate any exterior designated smoking areas away from entries, outdoor air intakes and operable windows, OR Prohibit smoking in the building except in designated smoking rooms and establish negative pressure in the smoking rooms together with provision of effective air filtration system.
SM	Sustainable Site Planning & Management	P-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.

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PART	CATEGORY	ITEM CODE	PREREQUISITE ITEM	REQUIREMENT
				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.
MR	Materials & Resources	P-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.
WE	Water Efficiency	P-WE4	Water Efficient Fittings	Reduce potable consumption by > 30%

IMPORTANT

All prerequisite items are mandatory requirements. Projects must comply with all prerequisite requirements before any points obtained under the scoring criteria can be considered for GBI certification.

Failure to comply with any prerequisite item may result in ineligibility for certification or requirement for corrective action.

DETAIL ASSESSMENT CRITERIA

SUMMARY OF CONTENTS

PART	CRITERIA	ITEM	POINTS	TOTAL
1	EE	ENERGY EFFICIENCY		
	Design & Performance			35
	EE1	Minimum EE Performance	1	
	EE2	Lighting Zoning	3	
	EE3	Electrical Sub-metering & Tenant Sub-metering	1	
	EE4	Renewable Energy	5	
	EE5	Advanced EE Performance- BEI	15	
	Commissioning			
	EE6	Enhanced Commissioning of the Building Energy Systems	3	
	EE7	Post Occupancy Commissioning	2	
	Verification & Maintenance			
EE8	EE Verification	2		
EE9	Sustainable Maintenance	2		
EE10	Continuous Energy Management	1		
2	EQ	INDOOR ENVIRONMENTAL QUALITY		
	Air Quality			21
	EQ1	Minimum IAQ Performance	1	
	EQ2	Environmental Tobacco Smoke (ETS) Control	1	
	EQ3	Demand Controlled Ventilation	1	
	EQ4	Indoor Air Pollutants	2	
	EQ5	Mould Prevention	1	
	EQ6	Continuous IAQ Monitoring	1	
	Thermal Comfort			
	EQ7	Thermal Comfort: Design & Controllability of Systems	2	
	Lighting, Visual & Acoustic Comfort			
	EQ8	Integrated Daylighting Design	3	
	EQ9	Electric Lighting Design and Quality	1	
	EQ10	Reduced Flickering	1	
	EQ11	External Views	2	
EQ12	Internal Noise Levels	1		
Verification				
EQ13	IAQ Before & During Occupancy	2		
EQ14	Post Occupancy Comfort Survey: Verification	1		
Resilient Design				
EQ15	Resilient IAQ	1		

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PART	CRITERIA	ITEM	POINTS	TOTAL
3	SM	SUSTAINABLE SITE PLANNING & MANAGEMENT		16
	Site Planning			
	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 & Electric Vehicle Infrastructure	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		11
	Reused & Recycled materials			
	MR1	Materials Reuse and Selection	1	
	MR2	Recycled Content Materials	1	
	Sustainable Resources			
	MR3	Regional Materials	1	
	MR4	Sustainable Timber	1	
	Waste Management			
	MR5	Storage & Collection of Recyclables	1	
	MR6	Construction Waste Management	1	
	Green Products			
	MR7	Refrigerants & Clean Agents	2	
	MR8	Reduction of Upfront Carbon	3	
5	WE	WATER EFFICIENCY		10
	Water Harvesting & Recycling			
	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	1	
	Water Resiliency			
	WE6	Resilient Clean Water Supply	1	
6	IN	INNOVATION		7
	IN1	Innovation in Design & Environmental Design Initiatives	6	
	IN2	Green Building Index Accredited Facilitator	1	
TOTAL POINTS				100

1

ENERGY EFFICIENCY (EE)

DESIGN & PERFORMANCE | COMMISSIONING | MONITORING, IMPROVEMENT & MAINTENANCE

35 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
DESIGN & PERFORMANCE				
EE1	MINIMUM EE PERFORMANCE			
	Establish minimum energy efficiency (EE) performance to reduce energy consumption in buildings, thus reducing CO₂ emission to the atmosphere. Meet the following minimum EE requirements as stipulated in local building code and MS1525: 1) Submit calculations for OTTV $\leq 50 \text{ W/m}^2$ AND 2) RTTV $\leq 25 \text{ W/m}^2$ OR Lightweight Roof U-Value $\leq 0.4 \text{ W/m}^2\text{K}$ OR Heavyweight Roof U-Value $\leq 0.6 \text{ W/m}^2\text{K}$, AND 3) Provision of Energy Management Control system where Air-conditioned space $\geq 4000 \text{ m}^2$	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 100m ² 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 occupancy sensors or equivalent to complement lighting zoning for area equivalent to 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 $\geq 100\text{kVA}$; 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 2 % of the total electricity consumption is generated by renewable energy, OR	2		
	Where 5 % of the total electricity consumption is generated by renewable energy, OR	3		
	Where 10 % of the total electricity consumption is generated by renewable energy, OR	4		
	Where 15 % of the total electricity consumption is generated by renewable energy	5		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE		
DESIGN & PERFORMANCE (CONTINUED)						
EE5	ADVANCED EE PERFORMANCE					
	1) Exceed Energy Efficiency (EE) performance better than the baseline minimum to reduce energy consumption in the building operation.		15			
	PATHWAY 1: BENCHMARKING APPROACH					
	Achieve Building Energy Intensity (BEI) excluding On-Site Renewable Energy ≤ 180 kWh/m²yr, OR	1				
	BEI ≤ 150, OR	2				
	BEI ≤ 140, OR	3				
	BEI ≤ 130, OR	5				
	BEI ≤ 120, OR	8				
	BEI ≤ 110, OR	10				
	BEI ≤ 100, OR	12				
	BEI ≤ 90	15				
	PATHWAY 2: PERFORMANCE BASED APPROACH					
	Achieve Percentage Reduction of Building Energy Consumption excluding On-Site Renewable Energy compared to MS1525 baseline ≥ 15%, OR	1				
	≥ 30%, OR	2				
	≥ 35%, OR	3				
	≥ 40%, OR	5				
	≥ 45%, OR	8				
	≥ 50%, OR	10				
	≥ 55%, OR	12				
	≥ 60%	15				
COMMISSIONING						
EE6	ENHANCED COMMISSIONING OF THE 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: • Conducting at least one commissioning design review during the detail design stage and back-check the review comments during the tender documentation stage. • Developing and incorporating commissioning requirements into the tender documents. • Developing and implementing a commissioning plan. • Verifying the installation and performance of the systems to be commissioned. • Reviewing contractor submittals applicable to systems being commissioned for compliance. • Developing a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems. • Verifying that the requirements for training operating personnel and building occupants are completed. Awarded where the CxS carries out a full post/re-commissioning of the energy related systems to verify that their performance is sustained in conjunction with the completed tenancy fit-outs/plant modifications.	3	3			

GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
COMMISSIONING (CONTINUED)				
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 Control System (EMCS) to monitor and analyse energy consumption including reading of submeters, AND 2) Fully commission EMCS 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		2	
	1) Provide for a designated building maintenance office that is fully equipped with facilities (including tools and instrumentation) and inventory storage.	1		
	2) 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. 3) Provide evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget (inclusive of staffing and outsourced contracts).	1		
EE10	CONTINUOUS ENERGY MANAGEMENT			
	Develop and implement Energy Management System (EnMS) in accordance with ISO50001 or equivalent within 12 months of practical completion.	1	1	
ENERGY EFFICIENCY (EE) TOTAL			35	

2

INDOOR ENVIRONMENTAL QUALITY (EQ)

AIR QUALITY | OCCUPANT COMFORT | LIGHTING, VISUAL & ACOUSTIC | 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 or the local building code whichever is the more stringent.	1	1	
EQ2	ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL			
	Prohibit smoking in the building and locate any exterior designated smoking areas away from entries, outdoor intakes and operable windows, OR Prohibit smoking in the building except in designated smoking rooms and establish negative pressure in the smoking rooms together with provision of effective air filtration system.	1	1	
EQ3	DEMAND CONTROLLED VENTILATION			
	Provide response monitoring of carbon dioxide levels to ensure delivery of minimum outside air requirements: Installed 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 of Low-Emitting materials for paint, coatings and carpet.	1		
	Use Low-Emitting materials for composite wood, insulation, walls, adhesive and sealant.	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
AIR QUALITY (CONTINUED)				
EQ6	CONTINUOUS IAQ MONITORING			
	Install continuous indoor air quality monitoring system with at least one (1) IAQ monitor sensor at each occupancy floor. A minimum of three (3) of following parameters to be monitored: • Carbon dioxide (CO₂) • Particulate matter (PM_{2.5}) • Total volatile organic compounds • Temperature • Relative humidity Monitor sensor to be installed at 1-2 metres from the floor.	1	1	
THERMAL COMFORT				
EQ7	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.			
	Design to ASHRAE 55 in conjunction with the relevant localised parameters as listed 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	2	
LIGHTING, VISUAL & ACOUSTIC COMFORT				
EQ8	INTEGRATED DAYLIGHTING DESIGN			
	Provide good levels of daylighting for building occupants.			
	PATHWAY 1: STATIC SIMULATION METHOD 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.	1		
	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	3	
	PATHWAY 2: CLIMATE-BASED DAYLIGHT MODELING Demonstrate by simulation ≥ 50% of the NLA receives at least 300 lux of daylight for at least 50% of the annual occupied hours, AND Demonstrate by simulation the annual sunlight overexposure (>2000lx) does not exceed 250 annual working hours. Mitigation strategies to be provided if thresholds are exceeded. (Note: sDA_{300/50%} and ASE_{2000,250} is applicable for office buildings. For other building typologies, please referred to GBI.)	3		

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ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
LIGHTING, VISUAL & ACOUSTIC COMFORT (CONTINUED)				
EQ9	ELECTRIC LIGHTING DESIGN & QUALITY			
	Demonstrate that the lighting design maintains average illuminance levels no more than MS ISO/CIE 8995-1 and lighting power densities no more than MS1525 for a minimum of 90% of GFA, AND Unified Glare Rating (UGR) no more than MS ISO/CIE 8995-1 for a minimum of 90% of GFA, AND Colour Rendering Index (CRI) no less than 80 or as per MS ISO/CIE 8995-1, whichever is higher for a minimum of 90% of GFA.	1	1	
EQ10	REDUCED FLICKERING			
	Install low flicker luminaires for a minimum of 90% of GFA. Where LED luminaires are used, they shall be: a) Classified as "reduced flicker operation" per California Title 24, when tested according to the requirements in Joint Appendix JA-10. The LED product will have less than 30% flicker at frequencies below 200 Hz at 100% and 20% output. OR b) Comply with IEEE1789 Recommended practices where: - Below 90Hz the modulation % should be less than 0.025 x the frequency - At or above 90Hz, the modulation % is below 0.08x frequency - Modulation % = $100 \times (L_{max} - L_{min}) / (L_{max} + L_{min})$ where L_{max} and L_{min} corresponds to the maximum and minimum luminance. OR c) Comply with The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021 whereby $P_{st} LM \leq 1,0$ at full-load and $SVM \leq 0.4$ at full-load (except for light sources intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI < 80). Where fluorescent luminaires are used, electronic ballasts with a frequency range of 20kHz and higher shall be used.	1	1	
EQ11	EXTERNAL VIEWS			
	Reduce eyestrain for building occupants by allowing long distance views and provision of visual connection to the outdoor.		2	
	Demonstrate that $\geq 60\%$ of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.	1		
	Demonstrate that $\geq 75\%$ of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.	1		
EQ12	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				
EQ13	IAQ BEFORE AND 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		
EQ14	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. <i>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, CO2 level, VOCs, and particulate concentration.</i>	1	1	
RESILIENT DESIGN				
EQ15	RESILIENT IAQ			
	The ventilation system is able to meet the minimum Equivalent Clean Airflow Rate in ASHRAE 241 when operated under Infection Risk Management Mode (IRMM) for 50% of the building occupants.	1	1	
	INDOOR ENVIRONMENTAL QUALITY (EQ) TOTAL			21

3

SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

FACILITY MANAGEMENT | TRANSPORTATION | REDUCE HEAT ISLAND EFFECT

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	
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 20,300m² 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. <i>Basic Services include, but are not limited to:</i> 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. <i>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.</i>	1		

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GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
SITE PLANNING (CONTINUED)				
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 existing natural area and restore damaged area to provide habitat and promote biodiversity.	1	1	
SM6	QLASSIC			
	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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GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

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 & ELECTRIC VEHICLE INFRASTRUCTURE			
	Encourage use of green vehicles: Preferred parking for low-emitting and fuel-efficient vehicles for 5% of the total provided parking spaces AND At least one EV charging station with the spare electricity provision for future installation of EV charging station for each parking bay serving 5% of the total project parking (up to a maximum of 20 bays).	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. Implement a storm water management plan that results in a 25% decrease in the volume of storm water runoff required under MASMA.	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. 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; 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: $(Area\ of\ SRI\ Roof / 0.75) + (Area\ of\ vegetated\ roof / 0.5) \geq Total\ Roof\ Area$ <i>Roof Type Slope SRI</i> <i>Low-Sloped Roof < 2:12 78</i> <i>Steep-Sloped Roof > 2:12 29</i>	1	2	
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 & RECYCLED MATERIALS | SUSTAINABLE RESOURCES | WASTE & CARBON MANAGEMENT

11 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
REUSED AND RECYCLED MATERIALS				
MR1	MATERIAL REUSE AND SELECTION			
	Reuse construction formwork, 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. Where reused products/materials constitute $\geq 5\%$ of the project's total eligible permanently installed material cost.	1	1	
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) 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 $\geq 20\%$ (based on cost) of the total value of the materials in the project.	1	1	
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 $\geq 20\%$ (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 $\geq 50\%$ of wood-based materials and products used are certified. <i>These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. Compliance with Forest Stewardship Council and Malaysian Timber Certification Council requirements.</i>	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: Recycle and/or salvage $\geq 50\%$ volume of non-hazardous construction debris.	1	1	

GREEN BUILDING INDEX ASSESSMENT CRITERIA FOR NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
GREEN PRODUCTS				
MR7	REFRIGERANTS & CLEAN AGENTS			
	Use environmentally-friendly Refrigerants (for cooling & heating) and Clean Agents (for fire suppression) exceeding Malaysia's commitment to the Montreal & Kyoto protocols and the Kigali Amendment.		2	
	Use zero Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) < 700 refrigerants/clean agents;	1		
	Use non-synthetic (natural) refrigerants/clean agents with zero ODP and negligible Global Warming Potential.	1		
MR8	REDUCTION OF UPFRONT CARBON			
	Use of Low Embodied Carbon Building Materials that leads to ≥10% reduction in Upfront Carbon.	1	3	
	Use of Low Embodied Carbon Building Materials that leads to ≥20% reduction in Upfront Carbon.	1		
	Use of Low Embodied Carbon Building Materials that leads to ≥30% reduction in Upfront Carbon.	1		
MATERIALS & RESOURCES (MR) TOTAL			11	

5

WATER EFFICIENCY (WE)

WATER HARVESTING & RECYCLING | INCREASED EFFICIENCY | WATER RESILIENCY

10 POINTS

ITEM	AREA OF ASSESSMENT		DETAIL POINTS	MAX POINTS	SCORE
WATER HARVESTING & RECYCLING					
WE1	RAINWATER HARVESTING				
	Encourage rainwater harvesting and water recycling 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 the design of systems that monitors and manages water consumption:			2	
	Reduce annual potable water consumption by ≥ 30%, OR	1			
	Reduce annual potable water consumption by ≥ 50%	2			
WE5	METERING AND LEAK DETECTION SYSTEM				
	Encourage the design of systems that monitors and manages water consumption: Use of sub-meters to monitor and manage major water usage for cooling towers, irrigation, kitchens and tenancy use AND Link all water sub-meters to BAS to facilitate early detection of water leakage.		1	1	
WATER RESILIENCY					
WE6	RESILIENT CLEAN WATER SUPPLY				
	Resiliency of water supply during periods of water disruption due to drought or pollution of water source. Provide on-site potable water storage capacity for a minimum of three (3) days, based on a water-efficient building case and verified against monitored daily potable water consumption.		1	1	
WATER EFFICIENCY (WE) TOTAL				10	

6

INNOVATION (IN)

INNOVATION & ENVIRONMENTAL INITIATIVES | GBI FACILITATOR

7 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
IN1	INNOVATION & 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: • Advanced air filtration technology (serving at least 90% of the NLA); • Air & Dirt Separator for Chilled Water System; • Auto-condenser tube cleaning system (fitted to plant equipment serving at least 90% of total capacity); • Automatic Refrigerant leakage detection and recycling facilities; • Bioswales; • Central vacuum system (serving at least 50% of NLA); • Central Pneumatic Waste Collection system; • 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; • CUI $\leq 0.45 \text{ m}^3/\text{m}^2$; • Electrochromic Glazed Façade; • External Shading Devices; • Heat recovery system (contributing to at least 10% of total required capacity); • Heat pipe technology; • Herb Garden; • Industrialised Building System (IBS); • Light pipes; • LED Façade Lighting; • Mixed mode / low energy ventilation system; • Non-chemical condenser water treatment system; • On-site Composting; • Parking Guidance System; • Real time energy and water usage display and other educational features/facilities; • Regenerative Lift; • Self-cleaning façade; • Sprinkler System Alarm Valve Water Recycling during Regular Testing; • Solar thermal technology / Solar Air conditioners (generating at least 10% of total required capacity); • Thermal / PCM / Thermal Mass storage system (accounting for at least 25% of total required capacity); • Universal Design; • Vertical Green Wall; • Waterless urinals (fitted to all male toilets)	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	