GBI ASSESSMENT CRITERIA
FOR
RESIDENTIAL NEW CONSTRUCTION (RNC)

FIRST EDITION | JUNE 2009 | VERSION 1.0

www.greenbuildingindex.org | info@greenbuildingindex.org

GREENBUILDINGINDEX SDN BHD (845666-V) 4 & 6 Jalan Tangsi, 50480 Kuala Lumpur, Malaysia **Tel** 603 2693 4182 **Fax** 603 2692 8782

CONTENTS

ACKNOWLEDGEMENT & COPYRIGHT

The Green Building Index (GBI) is developed by PAM and ACEM for the purposes as mentioned herein and may be subject to updating and/or modification in future.

While every care has been taken by PAM and ACEM in the development of the GBI to establish and acknowledge copyright of the information and materials used, and contact the copyright owners known to PAM/ACEM, PAM and ACEM tender their apologies for any accidental omissions.

DISCLAIMERS

PAM and/or ACEM and/or GSB shall not be held liable for any improper or incorrect use of the GBI (inclusive of the materials and/or information contained therein) and assume no responsibility for any user's use of it. In no event shall PAM and/or ACEM and/or GSB be liable for any damages whatsoever, whether direct, indirect, incidental, special, exemplary or consequential (including, but not limited to business interruption or loss of use, data or profits) regardless of cause, and on any basis of liability, whether in contract, strict liability or tort (including negligence, misrepresentation or otherwise) arising in any way out of the use of the GBI or the information and materials contained therein.

The information and materials in the GBI are provided "as is" and without warranties of any kind expressed or implied. PAM, ACEM and GSB do not warrant or make representations as to the accuracy and completeness of any information and/or materials contained therein. While every effort has been made to check the accuracy and completeness of the information and materials given, the users should always make their own relevant checks. Accordingly, PAM, ACEM and GSB do not accept responsibility and liability for misstatements made in it or misunderstanding from it.

The GBI is no substitute for professional advice. Users are advised to consult with appropriate and accredited professional advisors for advice concerning specific matters pertaining to the GBI before adopting or using it. PAM, ACEM and GSB disclaim any responsibility for positions taken by users in their individual cases or for any misunderstandings and losses, direct or indirectly, on the part of the users.

PAM, ACEM and GSB do not endorse or otherwise acknowledge the GBI rating achieved by the use of the GBI. PAM, ACEM and GSB offer a formal certification process for ratings; which service provides for independent third party review of points claimed to ensure that all credits can be demonstrated to be achieved by the provision of the necessary documentary evidence. Use of the GBI without formal certification by GSB does not entitle the user or any other party to promote the achieved GBI rating.

INDEMNIFICATION

To the extent permitted by applicable law, by using GSB's GBI, the user agrees to defend, indemnify, and hold harmless, PAM and/or ACEM and/or GSB, their officers, employees, members, representatives and agents from and against all claims and expenses of whatsoever kind and amount, arising out of the user's use of the GBI or materials and information contained therein and not to pursue any cause of action whatsoever against PAM and/or ACEM and/or GSB under any conceivable circumstances.

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	23	
2	Indoor Environmental Quality	11	
3	Sustainable Site Planning & Management	39	
4	Material & Resources	9	
5	Water Efficiency	12	
6	Innovation	6	
	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 SCORE SUMMARY

PART	CRITERIA	ITEM	POINTS	TOTAL
1	**EE**	**ENERGY EFFICIENCY**		
	EE1	Minimum EE Performance	3	**23**
	EE2	Renewable Energy	5	
	EE3	Advanced EE Performance based on OTTV & RTTV	10	
	EE4	Home Office & Connectivity	2	
	EE5	Sustainable Maintenance	3	
2	**EQ**	**INDOOR ENVIRONMENTAL QUALITY**		
	Air Quality, Lighting, Visual & Acoustic Comfort			**11**
	EQ1	Minimum IAQ Performance	2	
	EQ2	Daylighting	2	
	EQ3	Sound Insulation	2	
	EQ4	Good Quality Construction	1	
	EQ5	Volatile Organic Compounds	1	
	EQ6	Formaldehyde Minimisation	1	
	Verification			
	EQ7	Post Occupancy Evaluation: Verification	2	
3	**SM**	**SUSTAINABLE SITE PLANNING & MANAGEMENT**		
	Site Planning & Transport			**39**
	SM1	Site Selection	1	
	SM2	Public Transportation Access	12	
	SM3	Community Services & Connectivity	8	
	SM4	Open Spaces, Landscaping & Heat Island Effect	4	
	Site & Construction Management			
	SM5	Construction System & Site Management	3	
	SM6	Stormwater Management	3	
	SM7	Re-development of Existing Sites & Brownfield Re-development	4	
	SM8	Avoiding Enviromentally Sensitive Areas	2	
	SM9	Building User Manual	2	
4	**MR**	**MATERIALS & RESOURCES**		
	Reused & Recycled Materials			**9**
	MR1	Storage & Collection of recyclables	2	
	MR2	Materials Reuse and Selection	2	
	MR3	Construction Waste Management	2	
	Sustainable Resources			
	MR4	Recycled Content Materials	1	
	MR5	Regional Materials	1	
	MR6	Sustainable Timber	1	
5	**WE**	**WATER EFFICIENCY**		
	Water Harvesting & Recycling			**12**
	WE1	Rainwater Harvesting	4	
	WE2	Water Recycling	2	
	Increased Efficiency			
	WE3	Water Efficient Landscaping	2	
	WE4	Water Efficient Fittings	4	
6	**IN**	**INNOVATION**		
	IN1	Innovation in Design & Environmental Design Initiatives	5	**6**
	IN2	Green Building Index Facilitator (GBIF)	1	
			TOTAL POINTS	**100**

1 ENERGY EFFICIENCY (EE)

MINIMUM EE PERFORMANCE | RENEWABLE ENERGY | ADVANCED EE PERFORMANCE | HOME OFFICE & CONECTIVITY

23 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
EE1	**MINIMUM EE PERFORMANCE**			
	Establish minimum Energy Efficiency (EE) performance to reduce energy consumption in buildings, thus reducing CO_2 emission to the atmosphere. Apply OTTV and RTTV formulas of MS 1525 for residential buildings. OTTV ≤ 50 W/m², RTTV ≤ 25 W/m² Roof U ≤ 0.4 W/m²K (Lightweight) Roof U ≤ 0.6 W/m²K (Heavyweight)	3	**3**	
EE2	**RENEWABLE ENERGY**			
	Encourage use of renewable energy.		**5**	
	A) Low-rise (3-Storeys and below):			
	Where 1 kWp is generated by renewable energy, ***OR***	1		
	Where 40% of building energy consumption or 2 kWp (whichever is the lower) is generated by renewable energy, ***OR***	2		
	Where 60% of building energy consumption or 3 kWp (whichever is the lower), ***OR***	3		
	Where 80% of building energy consumption or 4 kWp (whichever is the lower), ***OR***	4		
	100% of building energy consumption or 5 kWp (whichever is the lower)	5		
	B) Hi-rise (Above 3-Storeys):			
	Where 0.5% of building energy consumption or 5 kWp (whichever is the higher) is generated by renewable energy, ***OR***	1		
	Where 1.0% of building energy consumption or 10 kWp (whichever is the higher), ***OR***	2		
	Where 1.5% of building energy consumption or 20 kWp (whichever is the higher), ***OR***	3		
	Where 2.0% of building energy consumption or 30 kWp (whichever is the higher), ***OR***	4		
	Where 2.5% of building energy consumption or 40 kWp (whichever is the higher)	5		
EE3	**ADVANCED EE PERFORMANCE BASED ON OTTV & RTTV**			
	Establish EE Performance to reduce dependence on Energy to keep indoor environment at satisfactory comfort level. Computed OTTV and RTTV to show lower dependence on Energy to maintain indoor thermal comfort.		**10**	
	OTTV ≤ 46 W/m² Lightweight Roof U-value ≤ 0.35 W/m²K Heavyweight Roof U-value ≤ 0.5 W/m²K	2		
	OTTV ≤ 44 W/m² Lightweight Roof U-value ≤ 0.30 W/m²K Heavyweight Roof U-value ≤ 0.4 W/m²K	4		
	OTTV ≤ 42 W/m² Lightweight Roof U-value ≤ 0.25 W/m²K Heavyweight Roof U-value ≤ 0.3 W/m²K	6		
	OTTV ≤ 40 W/m² Lightweight Roof U-value ≤ 0.2 W/m²K Heavyweight Roof U-value ≤ 0.2 W/m²K	8		
	OTTV ≤ 38 W/m² Lightweight Roof U-value ≤ 0.15 W/m²K Heavyweight Roof U-value ≤ 0.15 W/m²K	10		
EE4	**HOME OFFICE & CONNECTIVITY**			
	Encourage dual use spaces and working from Home thereby discourage avoidable commuting.		**2**	
	Multiple-use type developments, ***OR*** High speed internet access available at homes > 1MB/s	2		
EE5	**SUSTAINABLE MAINTENANCE**			
	Ensure that the building's energy related systems will continue to perform as intended beyond the 12 months Defects & Liability Period. Document Green Building Design features and strategies for user information and guide to sustain performance during occupancy.		**3**	
	Buildings With Common Management: 1. Provide a designated building maintenance office equipped with facilities (including tools and instrumentation) and inventory storage; 2. Provide evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget; ***OR***	3		
	Buildings Without Common Management: 1. Provide a evidence of documented plan for at least 3-year preventive maintenance budget.	3		
	ENERGY EFFICIENCY (EE) TOTAL		**23**	

2 INDOOR ENVIRONMENTAL QUALITY (EQ)

AIR QUALITY, LIGHTING, VISUAL & ACOUSTIC COMFORT | VERIFICATION

11 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
AIR QUALITY, LIGHTING, VISUAL & ACOUSTIC COMFORT				
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.		**2**	
	Meet the minimum requirements of ventilation rate in the local building code	1		
	Provide cross ventilation for all public and circulation spaces	2		
EQ2	**DAYLIGHTING**			
	Encourage and recognise designs that provide good levels of daylighting for building occupants. Demonstrate that a nominated percentage of the Habitable Rooms as defined under UBBL has a daylight factor in the range 1.0 – 3.5% as measured at floor level;		**2**	
	if > 50% of Habitable spaces, ***OR***	1		
	if > 75% of Habitable spaces	2		
EQ3	**SOUND INSULATION**			
	Encourage and recognise building that is designed with adequate insulation between dwelling units. Ensure that the air bourne sound penetration between spaces are controlled within the following criteria;		**2**	
	Inter dwelling sound penetration between dewelling units < 45 dBAeq.	1		
	Intra dwelling air bourne sound penetration between walls in the same dwelling unit should not exceed the following values: Bedroom < 40 dBAeq Other areas < 30 dBAeq	1		
EQ4	**GOOD QUALITY CONSTRUCTION**			
	Encourage and recognise good quality construction – first time right – that does not require re-work that wastes materials and labour.		**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		
EQ5	**VOLATILE ORGANIC COMPOUNDS**			
	Encourage and recognise projects that reduce the detrimental impact on occupant health from finishes emitting internal air pollutants. Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants. Volatile Organic Compound (VOC) content to comply with requirements specified in international labelling schemes recognised by GBI. ***0.5 point is awarded for each of the following up to a maximum of 1 point:*** 1. Low VOC paint and coating 2. Low VOC carpet or flooring 3. Low VOC adhesive and sealant ***OR*** no adhesive and sealant used.	1	**1**	
EQ6	**FORMALDEHYDE MINIMISATION**			
	Reduce the exposure of occupants to formaldehyde and promote good indoor air quality in the living space. Products with no added urea formaldehyde are to be used. ***0.5 point is awarded for each of the following up to a maximum of 1 point:*** 1. Composite wood and agrifiber products defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores; 2. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies; 3. Insulation foam; 4. Draperies	1	**1**	
VERIFICATION				
EQ7	**POST OCCUPANCY EVALUATION: VERIFICATION**			
	Provide for the assessment of comfort of the building occupants over time.		**2**	
	Commit to implement a post-occupancy comfort survey of building occupants within a period of 12 months after occupancy. This survey should collect anonymous responses about thermal comfort, visual comfort and acoustic comfort in a building. This should include an assessment of overall satisfaction with thermal, visual and acoustic performance and identification of thermal-related, visual-related and acoustic-related problems.	1		
	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.	1		
	INDOOR ENVIRONMENTAL QUALITY (EQ) TOTAL		**11**	

3 SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SITE PLANNING & TRANSPORT | SITE & CONSTRUCTION MANAGEMENT

39 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
SITE PLANNING & TRANSPORT				
SM1	**SITE SELECTION & PLANNING**			
	Proposed development is appropriate for the site and complies with the Local Plan or Structure Plan for the area. **The proposed building must comply with the following requirements:** 1. The Structure Plan for the area ***AND/OR*** The Local Plan where available 2. Infrastructure requirement is available for the area.	1	**1**	
SM2	**PUBLIC TRANSPORTATION ACCESS**			
	Encourage the selection of sites close to transport hubs and the planning of new housing areas to encourage the use of public transport. This is to reduce the current and future heavy dependence on private transport, which is the greatest contributor to Green House Gas (GHG) emission. Points are awarded according to proximity of the development to public transport hubs and quality of the access to the transport hub. For new housing areas, the provision of transport hubs for the housing concerned with proper shelter, amenities, shuttle facilities and parking facilities are encouraged. Points are awarded according to the subsection categories. **NOTE: SELECT EITHER SM2A & SM2B *OR* SM2C & SM2D**		**12**	
	SM2A — **Distance from Mass Transport Station/Hub to building within 1km (50% of points if from Shuttle Bus Stop)**			
	0 - 250m	8	**8**	
	251 - 500m	6		
	501 - 750m	4		
	751m - 1km	2		
	SM2B — **Walkway from building to Mass Transport Station if less than 750m from Mass Transport Station**			
	Dedicated footpath	2	**4**	
	Covered walkway	3		
	Covered walkway that incorporates provision for the handicapped	4		
	OR			
	Sheltered and secured waiting area for shuttle van or bus in the residential building if more than 750m from Mass Transport Station	4		
	SM2C — **Transport Terminal within the Residential Area with covered seating and waiting area for a minimum of 10% of the total number of residential units**			
	Score is average of points of all residential units in the residential area as for **SM2A**	8	**8**	
	SM2D — **Walkway from building to Transport Terminal if less than 750m from Transport Terminal:**			
	Dedicated footpath	2	**4**	
	Covered walkway	3		
	Covered walkway that incorporates provision for the handicapped	4		
	OR			
	Car park provision next to Transport Terminal:			
	Car park provision for at least 20% of total number of residential units not more than 250m from the Terminal	4		
	OR			
	Designated bicycle lane provision in at least 90% of the Residential area and a Secured bicycle parking area in the Transport Terminal for 10% of the total number of residential units:			
	Provision of Bicycle Lanes	2		
	AND Provision of Bicycle Parking Area	2		

Continued on next page >>

ITEM	AREA OF ASSESSMENT		DETAIL POINTS	MAX POINTS	SCORE
SM3	**COMMUNITY SERVICES & CONNECTIVITY**				
	Encourage the selection of sites close to basic community amenities and the planning of new residential areas to encourage the provision of local amenities. This is to reduce the current and future heavy use of private transport after working hours, which is the greatest contributor to GHG emission. Points are awarded according to proximity of the development to community amenities. Points are awarded according to the subsection categories.			**8**	
	SM3A	Basic Amenities as listed below are provided or are available within 750m of the residential units ***(Less 1 point if more than 750m away)***: 1. Grocery Store or Mini-market 2. Restaurant or Coffee Shop 3. Surau or Mosque 4. Playground or Public Park	4		
	SM3B	Other Amenities as listed below are provided or are available within 750m of the residential units ***(0.5 point per item or equivalent up to maxiumm of 2 points. Less 0.5 point if more than 750m away)***: 1. Clinic or Medical Center 2. Police Station or Police Pondok 3. School or Creche 4. Bank, Post Office or ATM	2		
	SM3C	Additional Amenities as listed below are provided or are available within 750m of the residential units ***(0.5 point per item or equivalent up to maxiumm of 2 points. Less 0.5 point if more than 750m away)***: 1. Library 2. Community Center or Hall 3. Wet Market or Supermarket 4. Barber Shop 5. Laundry	2		
SM4	**OPEN SPACES, LANDSCAPING AND HEAT ISLAND EFFECT**				
	Development should have smaller footprints and more landscaping, thereby reducing the well known effects of heat islands around hard scaped areas.			**4**	
	Provision of landscaping with indigenous plants to 10% of total development area		1		
	Provision of additional similar landscaping of every extra 5%: ***1 point up to a maximum of 3 points***		3		
SITE & CONSTRUCTION MANAGEMENT					
SM5	**CONSTRUCTION SYSTEM & SITE MANAGEMENT**				
	Encourage IBS and reduce on-site construction. Reduce material wastage and construction wastage to landfill sites. Reduce the polluting effects of construction and from workers during construction.			**3**	
	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		
	CIDB IBS score ≥ 50%, ***OR***		1		
	CIDB IBS score ≥ 70%		2		
SM6	**STORM WATER MANAGEMENT**				
	Manage surface water run off from developments. Reduce the pollution and storm water loading of the river systems from the development. Reduce flood risk. Retain rainwater for recycling and appropriate use.			**3**	
	Complies with MASMA minimum requirements		1		
	Exceeds MASMA requirements by 30%: ***entitled to 2 additional points pro rated for lower values***		2		
SM7	**RE-DEVELOPMENT OF EXISTING SITES & BROWNFIELD SITES**				
	Discourage development in environmentally sensitive areas. Encourage re-development of existing sites. Reward rehabilitation of Brownfield site and development in the rehabilitated sites.			**4**	
	Re-development of exisitng sites or refurbishment of existing building		2		
	Rehabilitation of brownfield sites		2		
SM8	**AVOIDING ENVIROMENTALLY SENSITIVE AREAS**				
	Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.			**2**	
	Do not develop buildings, hardscape, roads or parking areas on portions of sites that meet any one of the following criteria: • Prime agriculture land as defined by the Town and Country Planning Act • Land that is specifically identified as habitat for any species threatened or endangered lists • Within 30 meters 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: • Previously undeveloped land that is within 15 meters of a water body, defined as seas, lakes, rivers, streams and tributaries which support or could support fish, recreation or industrial use. • Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner. • Land which is classified as Class IV (steeper than 30 degrees)		2		
SM9	**BUILDING USER MANUAL**				
	Document Green Building Design features & 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.		2	**2**	
	SUSTAINABLE SITE PLANNING & MANAGEMENT (SM) TOTAL			**39**	

4 MATERIALS & RESOURCES (MR)

REUSED AND RECYCLED MATERIALS | SUSTAINABLE RESOURCES

9 POINTS

ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS	SCORE
REUSED AND RECYCLED MATERIALS				
MR1	**STORAGE & COLLECTION OF RECYCLABLES**			
	Facilitate the reduction of waste generated by construction that is hauled and disposed off in landfills and recycling after occupancy.		**2**	
	During Construction, provide dedicated area(s) and storage for collection of non-hazardous materials for recycling.	1		
	During Building Occupancy, provide permanent recycle bins.	1		
MR2	**MATERIALS REUSE AND SELECTION**			
	Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources. Integrate building design and its buildability, with careful selection of building materials in relation with embodied energy and durability of the materials to lower carbon content and better building life cycle.		**2**	
	Use salvaged, refurbished or used materials such that the sum of these materials constitutes at least 1% (based on cost) of the total materials for the project. The used, refurbished and new building materials concerned are to be assessed for eco preferred content, durability, the product manufacturer's environmental management system and whether the product is modular and/or designed for disassembly. To include reusability and the number of cycles on the usage (minimum 15 cycles) of temporary materials; such as temporary formwork system, temporary framing or support system, etc. ***0.5 point for 1.0% and additional 0.25 point for every additional 0.5% up to a maximum of 2 points.***	2		
MR3	**CONSTRUCTION WASTE MANAGEMENT**			
	Divert construction debris from disposal in landfill and incinerator. Redirect recyclable recovered resources back to manufacturing process. Redirect reusable materials to appropriate sites.		**2**	
	Recycle and/or salvage at least 50% of non-hazardous construction debris. Develop and implement a construction waste management plan that, at a minimum identifies the materials to be diverted from disposal and whether the materials will be sorted on site or co-mingled. Quantify by measuring total tonnage of waste or truck loads of waste disposal. ***1 point for 50% and additional 0.25 point for every additional 5% up to a maximum of 2 points.*** ***If project uses high level of prefabrication with IBS score > 70, 1 point for every 10% increase in prefabrication up to a maximum of 2 points.***	2		
SUSTAINABLE RESOURCES				
MR4	**RECYCLED CONTENT MATERIALS**			
	Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.		**1**	
	Use materials with recycled content such that the sum of post-consumer recycled plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project. Recycled content shall be defined in accordance with the International Organization of Standards Document. ***0.5 point for 10% and 0.25 point for every additional 5% up to a maximum of 1 point.***	1		
MR5	**REGIONAL MATERIALS**			
	Increase demand for 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 a minimum of 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. ***0.5 point for 20% and 0.25 point for every additional 5% up to a maximum of 1 point.***	1		
MR6	**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.* ***Where the project has no timber content, this credit may be transferred to MR5***	1	**1**	
	MATERIALS & RESOURCES (MR) TOTAL		**9**	

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:		**4**	
	Rainwater harvesting that leads to ≥ 10% 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 > 40% reduction in potable water consumption, ***OR***	3		
	Rainwater harvesting that leads to > 50% reduction in potable water consumption	4		
WE2	**WATER RECYCLING**			
	Encourage water recycling that will lead to reduction in potable water consumption:		**2**	
	Treat and recycle ≥ 5% wastewater leading to reduction in potable water consumption, ***OR***	0.5		
	Treat and recycle ≥ 10% wastewater leading to reduction in potable water consumption, ***OR***	1		
	Treat and recycle ≥ 20% wastewater leading to reduction in potable water consumption, ***OR***	1.5		
	Treat and recycle ≥ 30% wastewater leading to reduction in potable water consumption	2		
INCREASED EFFICIENCY				
WE3	**WATER EFFICIENT 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:		**4**	
	Reduce annual potable water consumption by > 10%, ***OR***	1		
	Reduce annual potable water consumption by > 30%, ***OR***	2		
	Reduce annual potable water consumption by > 40%, ***OR***	3		
	Reduce annual potable water consumption by > 50%	4		
	WATER EFFICIENCY (WE) TOTAL		**12**	

6 INNOVATION (IN)

INNOVATION INITIATIVES | MAINTENANCE PROGRAM & GREEN BUILDING INDEX FACILITATOR

6 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 5 points, such as:*** • Innovative planning that displays "less is more" and "small is beautiful"; • Rehabilitation of existing buildings for re-use in innovative ways; • Innovative use of building features to passively cool the building • Heat recovery system (contributing to at least 10% of total required capacity); • Mixed mode / low energy ventilation system; • Waterless urinals (fitted to all male toilets); • Central waste conveyance system; • Central vacuum system	5	**5**	
IN2	**GREEN BUILDING INDEX FACILITATOR (GBIF)**			
	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 principle participant of the project team shall be a Green Building Index Facilitator.	1		
	INNOVATION (IN) TOTAL		**6**	