



NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

DESIGN REFERENCE GUIDE &
SUBMISSION FORMAT

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INTRODUCTION

The purpose of the Green Building Index Design Reference Guide is to establish a guidance document to assist project teams in understanding the criteria for each of the main components of the Green Building Index Rating Tool. The project team can use the document as a guide when submitting for the Green Building Index as it clearly identifies examples of how and what is required for completing the submission. Each of the main six criteria's are further divided into the corresponding sub-sections in obtaining the necessary credit points. This guide is indicative and not an exhaustive/definitive reference to the Green Building Index rating tool.

The basic framework of this document sets out for each subsection the intent, description, requirements, approach & implementation and in some occasions calculations to achieve the credit point for each subsection. The Green Building Index Design Reference Guide further becomes the base curriculum for the training of facilitators on the Green Building Index Rating Tools.

To attain the Green Building Index classification, the procedures are as follows:

STAGE 1	APPLICATION & REGISTRATION
STAGE 2	DESIGN ASSESSMENT (DA)
STAGE 3	COMPLETION & VERIFICATION ASSESSMENT (CVA)

A summary of the stages is described below:

STAGE 1 | APPLICATION & REGISTRATION

Complete and submit the application through the GreenUP, including the Owner's information, project contact details, project information, and all required supporting documents to Greenbuildingindex Sdn Bhd (GSB). Upon review and approval of the application, GSB will confirm the applicable registration fee based on the project size. Once the registration fee has been paid, a unique GBI Registration Number will be issued, and the Terms and Conditions will be executed between the Applicant and GSB. Upon completion of the registration process, the Applicant may proceed to prepare and submit the Design Assessment (DA) through the GreenUP for certification.

GBI Registration Fees can be obtained from www.greenbuildingindex.org

GBI Terms & Conditions

An agreement spelling out the terms and conditions between Project owner and Greenbuildingindex Sdn Bhd to be duly signed at this stage.

STAGE 2 | DESIGN ASSESSMENT (DA)

The Design Assessment (DA) is conducted upon the submission of the required design documents and supporting information by the Project Design Team or Client (Architect, Engineer, Building Owner or Developer, either directly or through a GBI Facilitator) through the GreenUP. Following the acceptance of the project registration by Greenbuildingindex Sdn Bhd (GSB), the Project Design Team and Client shall compile and submit all information required to demonstrate compliance with the six GBI assessment criteria, in accordance with the submission requirements of the applicable GBI rating tool. It is recommended that the submission be based on the finalised design at the pre-construction stage (i.e. tender documentation stage), when all key design parameters have been confirmed. Upon satisfactory assessment, a Provisional GBI Design Assessment (DA) Certificate will be issued. Where additional information or clarification is required, the Applicant shall address the comments and resubmit the revised documents through the GreenUP for further assessment. A summary Design Assessment (DA) Checklist is provided to facilitate the determination of the project's target score and provisional certification rating.

STAGE 3 | COMPLETION & VERIFICATION ASSESSMENT (CVA)

The Completion & Verification Assessment (CVA) is conducted upon the issuance of the Certificate of Practical Completion (CPC), when the Project Design Team or Client (Architect, Engineer, Building Owner or Developer, either directly or through a GBI Facilitator) submits the required as-built drawings, calculations, and supporting documentation through the GreenUP. The Completion & Verification Assessment confirms that the targeted GBI criteria have been properly implemented and achieved for the intended certification classification.

Upon completion of the desktop assessment, where the project has achieved its targeted rating, the assigned GBI Certifier will conduct a site verification visit to confirm that the green building measures have been implemented in accordance with the approved submissions and comply with the requirements of the applicable GBI rating tool. Where the site verification confirms compliance, Greenbuildingindex Sdn Bhd (GSB) will issue the Final GBI Certificate and record and publish the certified project. Where the project does not satisfy the verification requirements or the targeted rating is not achieved, the Applicant may submit an appeal or resubmit the required information through the GreenUP for further assessment in accordance with the GBI certification procedures.

The verification shall be carried out within twelve (12) months from the issuance of the CPC (or CCC/OC/OP, whichever is later), or earlier where the building occupancy has reached at least fifty percent (50%). The verification process includes the review of actual measured energy and water consumption, sustainable site measures, indoor environmental quality and occupant comfort survey results together with any corrective action plans, the Building User Manual, and the Sustainable Maintenance programme. A summary Completion & Verification Assessment (CVA) Checklist is provided to facilitate the determination of the project's final score and certification rating.

APPEAL PROCEDURES

Appeal can be submitted (with fee paid) after receiving the Design Assessment result or after receiving the Completion & Verification Assessment results.

VALIDITY OF CERTIFICATION

The validity of the certification is limited for three (3) years. This is to encourage sustainable building maintenance management throughout the life of the building.

CERTIFIERS & FACILITATORS

GBI Certifiers perform the detailed assessment and accrediting tasks of building projects submitted to the GBI Accreditation Panel (GBIAP) for final certification.

GBI Facilitators provide services to enable building projects to achieve GBI Accreditation. A GBI Facilitator is a registered person with GSB having completed the training and examinations conducted by GSB.

GBI TERMS & CONDITIONS

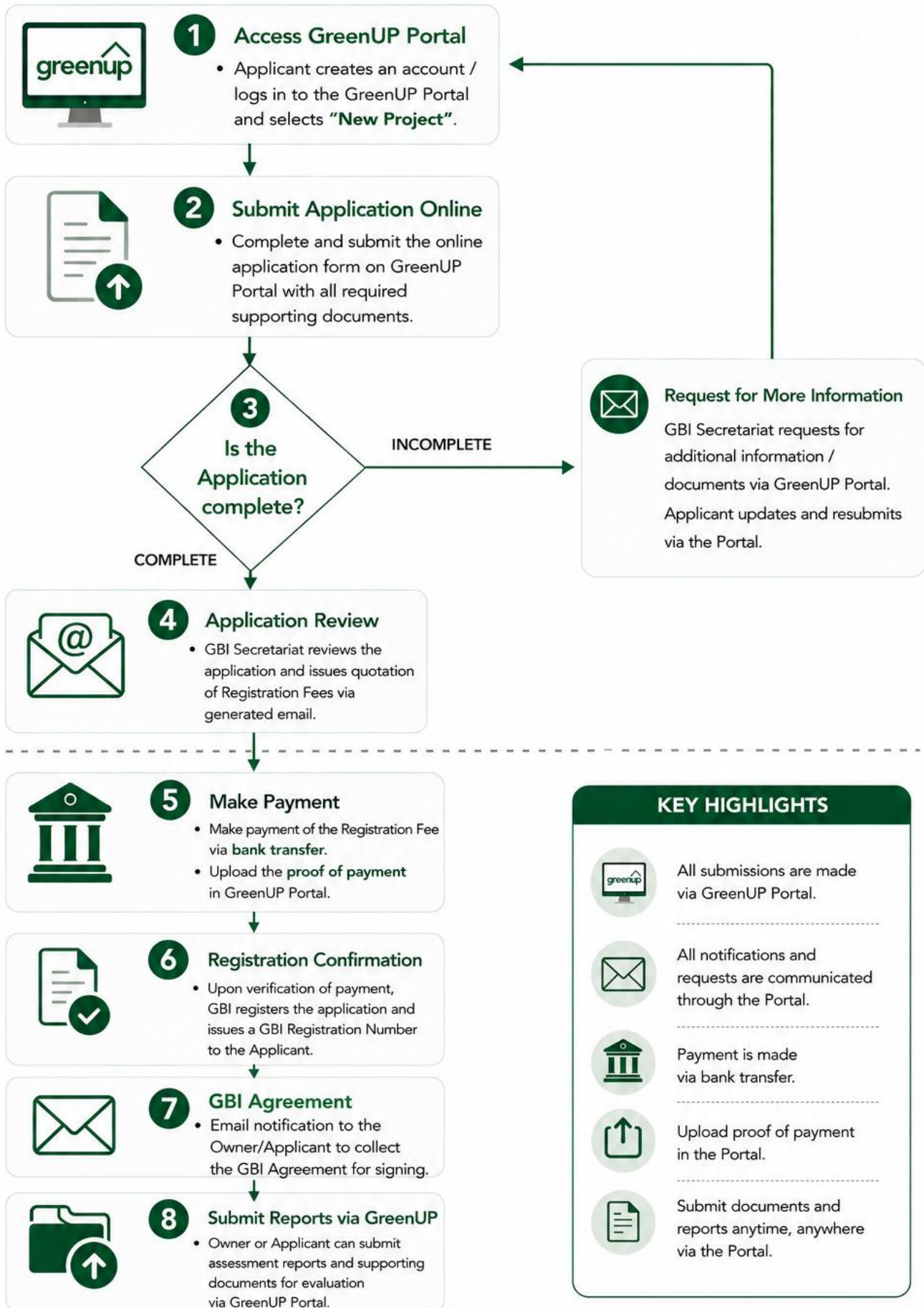
An agreement setting out the terms and conditions between the Project owner and Greenbuildingindex Sdn Bhd.



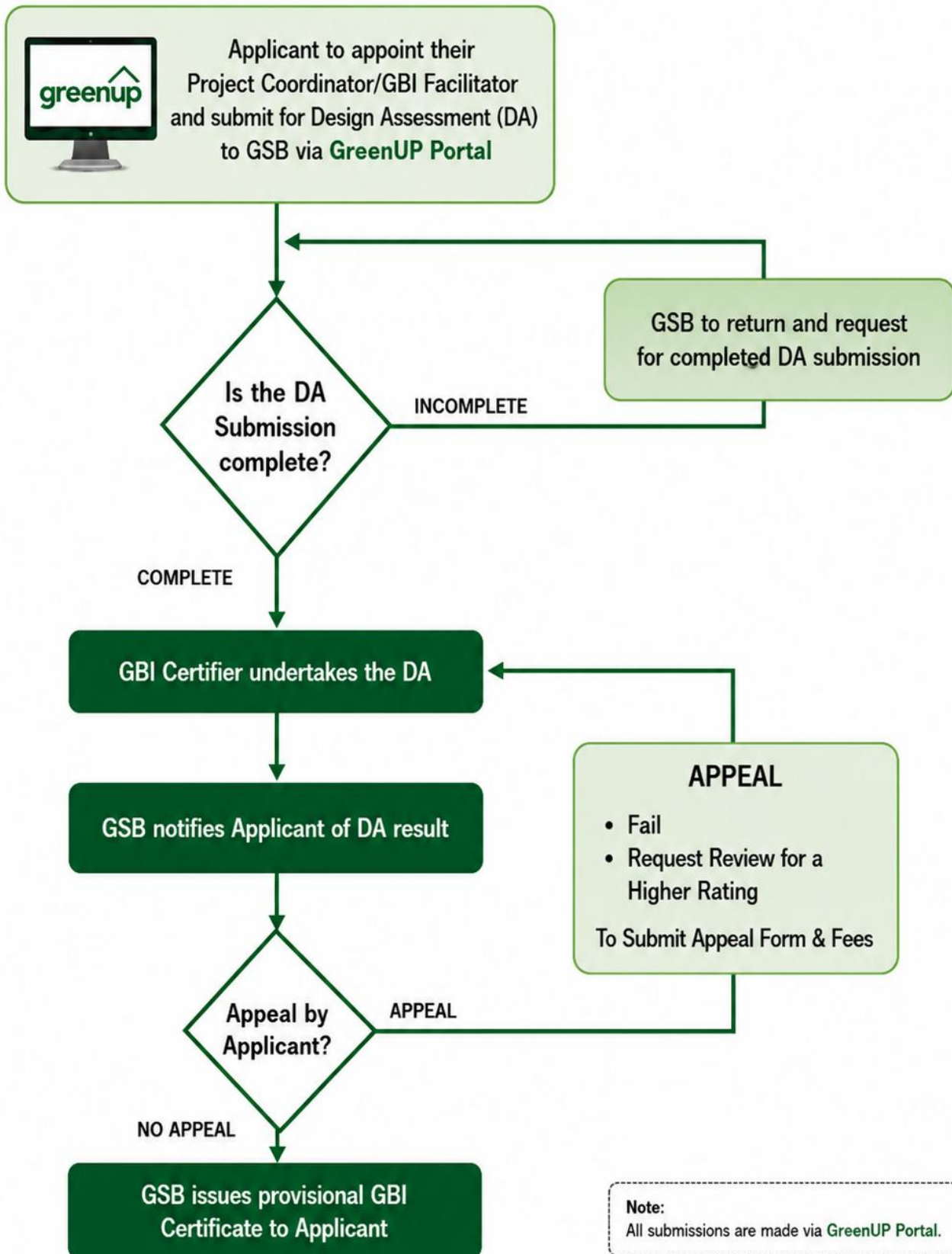
NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) PROCEDURES

STAGE 1

APPLICATION & REGISTRATION

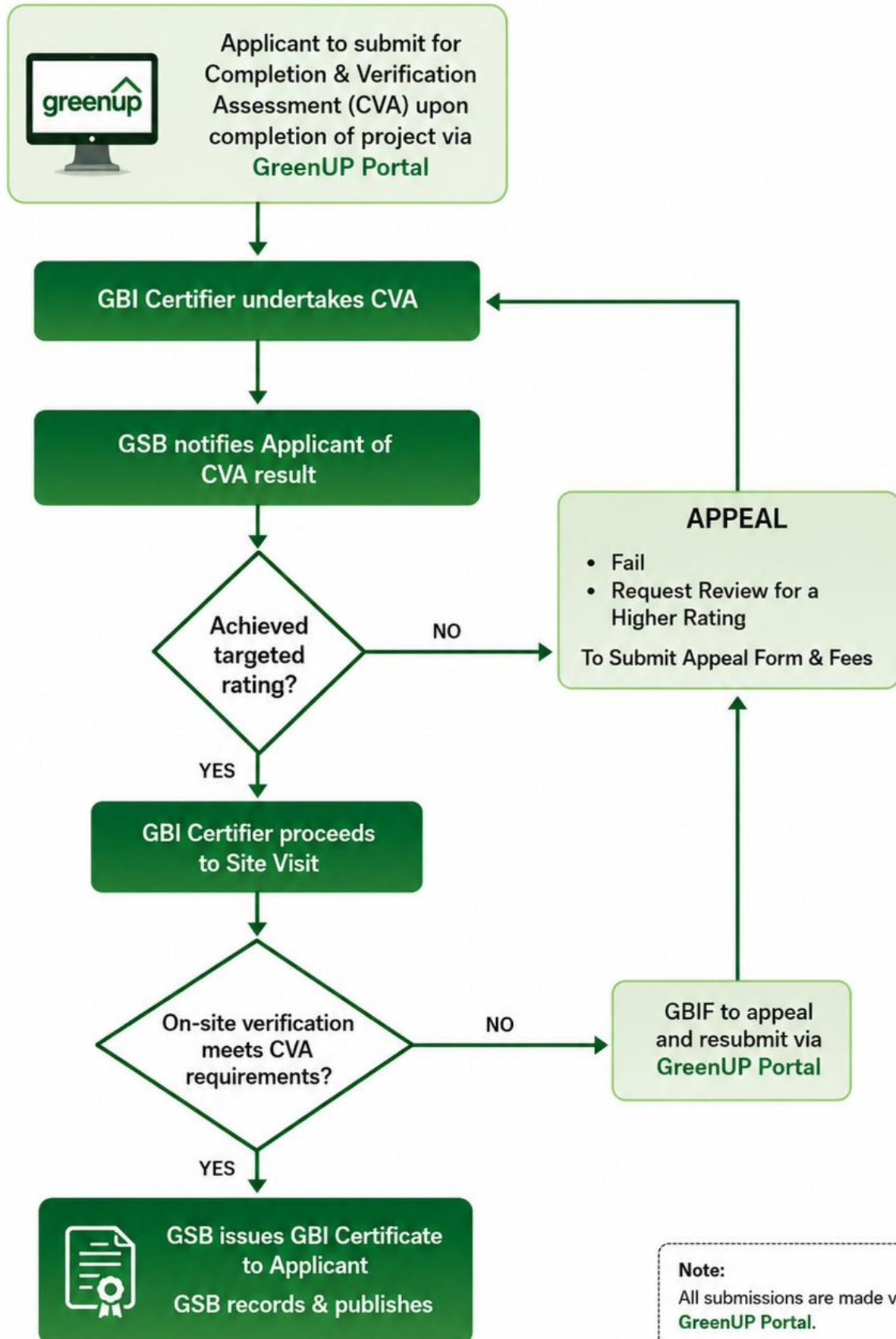


STAGE 2 DESIGN ASSESSMENT (DA)



STAGE 3

COMPLETION & VERIFICATION ASSESSMENT (CVA)





NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) CRITERIA CHECKLIST & SUBMISSION FORMAT

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ASSESSMENT CRITERIA

OVERALL POINTS SCORE

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

GREEN BUILDING INDEX CLASSIFICATION

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

ASSESSMENT CRITERIA
PREREQUISITE

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 Efficiency (BEI) of not more than $180 \text{ kWh/m}^2/\text{year}$.
		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.

ASSESSMENT CRITERIA

PREREQUISITE

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.

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) ASSESSMENT CRITERIA SCORE SUMMARY

PART	CRITERIA	ITEM	POINTS	TOTAL
1	EE	ENERGY EFFICIENCY		35
	Design & Performance			
	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		21
	Air Quality			
	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		

GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

PART	CRITERIA	ITEM	POINTS	TOTAL
3	SM	SUSTAINABLE SITE PLANNING & MANAGEMENT		
	Site Planning			16
	SM1	Site Selection	1	
	SM2	Brownfield Redevelopment	1	
	SM3	Development Density & Community Connectivity	2	
	SM4	Environment Management	2	
	Construction Management			
	SM5	Earthworks - Construction Activity Pollution Control	1	
	SM6	QLASSIC	1	
	SM7	Workers' Site Amenities	1	
	Transportation			
	SM8	Public Transportation Access	1	
	SM9	Green Vehicle Priority & 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		
	Reused & Recycled materials			11
	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		
	Water Harvesting & Recycling			10
	WE1	Rainwater Harvesting	2	
	WE2	Water Recycling	2	
	Increased Efficiency			
	WE3	Water Efficient - Irrigation/Landscaping	2	
	WE4	Water Efficient Fittings	2	
	WE5	Metering & Leak Detection System	1	
	Water Resiliency			
WE6	Resilient Clean Water Supply	1		
6	IN	INNOVATION		
	IN1	Innovation in Design & Environmental Design Initiatives	6	7
	IN2	Green Building Index Accredited Facilitator	1	
TOTAL POINTS			100	

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

The Non-Residential New Construction (NRNC) Reference Guide is formatted in reference to the Non-Residential New Construction Tool. It is envisaged that this reference guide is a live document that from time to time will be updated for the benefit of the end users.

The Reference guide has been formatted to form part of the basic criteria checklist for all documentation submissions for both the Design Assessment (DA) and Completion & Verification Assessment (CVA). The front cover sheet of the individual criteria will be attached with the documentation drawings, project narratives and technical submissions. The criteria checklist will be signed by the Principal Submitting Person (in short "PSP"), Submitting Person (in short "SP") or Specialist (in short "S") together with the client's (in short "C").

Enclosed the summary checklist together with the corresponding signatories required for each criteria.

PART	CRITERIA	ITEM	REQUIRED SIGNATORIES
1	EE	ENERGY EFFICIENCY	
	EE1	Minimum EE Performance	PSP and C
	EE2	Lighting Zoning	SP and C
	EE3	Electrical Sub-metering & Tenant Sub-metering	SP and C
	EE4	Renewable Energy	SP/S and C
	EE5	Advanced EE Performance - BEI	SP/S and C
	EE6	Enhanced Commissioning of the Building Energy Systems	SP/S and C
	EE7	Post Occupancy Commissioning	SP/S and C
	EE8	EE Verification	SP/S and C
	EE9	Sustainable Maintenance	SP/S and C
	EE10	Continuous Energy Management	S and C
2	EQ	INDOOR ENVIRONMENTAL QUALITY	
	EQ1	Minimum IAQ Performance	SP and C
	EQ2	Environmental Tobacco Smoke (ETS) Control	PSP and C
	EQ3	Demand Controlled Ventilation	SP and C
	EQ4	Indoor Air Pollutants	PSP and C
	EQ5	Mould Prevention	PSP/SP and C
	EQ6	Continuous IAQ Monitoring	SP and C
	EQ7	Thermal Comfort: Design & Controllability of Systems	SP and C
	EQ8	Integrated Daylighting Design	PSP and C
	EQ9	Electric Lighting Design and Quality	SP and C
	EQ10	Reduced Flickering	SP and C
	EQ11	External Views	PSP and C
	EQ12	Internal Noise Levels	PSP/SP and C
	EQ13	IAQ Before & During Occupancy	SP/S and C
	EQ14	Post Occupancy Comfort Survey: Verification	S and C
	EQ15	Resilient IAQ	SP and C
3	SM	SUSTAINABLE SITE PLANNING & MANAGEMENT	
	SM1	Site Selection	PSP and C
	SM2	Brownfield Redevelopment	PSP and C
	SM3	Development Density & Community Connectivity	PSP and C
	SM4	Environment Management	PSP and C
	SM5	Earthworks - Construction Activity Pollution Control	SP and C
	SM6	QLASSIC	PSP and C
	SM7	Workers' Site Amenities	PSP and C
	SM8	Public Transportation Access	PSP and C
	SM9	Green Vehicle Priority & Electric Vehicle Infrastructure	PSP and C
	SM10	Parking Capacity	PSP and C
	SM11	Stormwater Design - Quantity & Quality Control	SP and C
	SM12	Greenery & Roof	PSP/SP and C
	SM13	Building User Manual	S and C

PART	CRITERIA	ITEM	REQUIRED SIGNATORIES
4	MR	MATERIALS & RESOURCES	
	MR1	Materials Reuse and Selection	PSP/QS and C
	MR2	Recycled Content Materials	PSP/QS and C
	MR3	Regional Materials	PSP/QS and C
	MR4	Sustainable Timber	PSP/QS and C
	MR5	Storage & Collection of Recyclables	PSP/QS and C
	MR6	Construction Waste Management	PSP/QS and C
	MR7	Refrigerants & Clean Agents	SP and C
	MR8	Reduction of Upfront Carbon	QS/S and C
5	WE	WATER EFFICIENCY	
	WE1	Rainwater Harvesting	PSP/SP/S and C
	WE2	Water Recycling	SP/S and C
	WE3	Water Efficient - Irrigation/Landscaping	SP and C
	WE4	Water Efficient Fittings	PSP/QS and C
	WE5	Metering & Leak Detection System	SP and C
	WE6	Resilient Clean Water Supply	SP and C
6	IN	INNOVATION	
	IN1	Innovation in Design & Environmental Design Initiatives	PSP/SP/S and C
	IN2	Green Building Index Accredited Facilitator	S and C

PSP is defined as Architect or Engineer (similar to the definition in Certificate of Completion & Compliance, CCC)

SP is defined as Engineer, Landscape Architect, Planner and Quantity Surveyor (QS).

S is defined as Specialist which includes Facilitator, Project Manager, Facilities Manager, Energy or Sustainable Consultant and Commissioning Specialist.

C is defined as Client or client's assigned representative.

SUBMISSION FORMAT & SIGNATURES

All submission information shall be uploaded and submitted through the GreenUp together with the completed Criteria Cover Sheet and the required declarations and endorsements for each criterion, where applicable. The criteria checklist shall be completed by the submitter and accompanied by all supporting documentation as described under the "Required Submission for Design Assessment (DA)" or "Required Submission for Completion & Verification Assessment (CVA)". Please leave the GBI/GSB review columns blank for assessment purposes.

All submitted documents shall be duly verified and endorsed by the Qualified Submitting Professional (QSP) and/or relevant parties as part of the submission requirements. GSB reserves the right to reject or return incomplete submissions that do not comply with the submission requirements for corrective action.

The following is the recommended format for documents forming part of the Design Assessment (DA) and Completion & Verification Assessment (CVA) submissions:

1. All drawings, plans, sections, and elevations shall be submitted in PDF format, preferably generated from A3-size drawings, with all scales clearly indicated. Where drawings are reduced in size and become difficult to read, supplementary key plans and enlarged part plans shall be provided to ensure clarity of the building information.
2. All perspectives, renderings, and visual presentations shall be submitted in PDF or image format with sufficient resolution for clear viewing.
3. All reports, calculations, and supporting documents shall be submitted in PDF format. Endorsement, certification, or digital signatures by the Qualified Submitting Professional shall form part of the submission where required.
4. Clearly identify and label all uploaded documents according to the relevant Design Assessment Checklist or Completion & Verification Assessment Checklist criteria to facilitate the review process.

All submissions shall be made electronically through the GreenUp. Applicants are required to register for a GreenUP account via the GBI website prior to submission. No hardcopy submission is required.



NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) ASSESSMENT CRITERIA

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
ENERGY EFFICIENCY
(EE)

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE1	MINIMUM EE PERFORMANCE	1 POINT
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INTENT

To create energy efficiency (EE) awareness and promote the use of MS 1525.

DESCRIPTION

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 and MS 1525.

REQUIREMENTS

OTTV $\leq 50 \text{ W/m}^2$ **AND**

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**

Provision of Energy Management System Where Air-Conditioned space $\geq 4000\text{m}^2$

APPROACH & IMPLEMENTATION

Wall insulation can be achieved in many ways, such as, but not limited to, using autoclaved lightweight concretes, composite insulated walls, double brick wall and many other construction systems. Glazing should be optimally sized. The use of Insulated Glazing Units and/or performance glazing such as low-e and/or spectrally selective glazing is encouraged. Roof should be insulated with suitable insulation materials to prevent heat gain into occupied spaces.

POTENTIAL TECHNOLOGIES & STRATEGIES

Design the building envelope, HVAC, lighting and other systems to maximize energy performance.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Plans and elevations marking out walls & apertures used for the calculation-colored blue; and walls & apertures not used for calculation colored red. Recommended scale 1: 200.	☐	☐
2. OTTV calculations for each facing wall and roof	☐	☐
3. RTTV calculation (if applicable).	☐	☐
4. Description of walls, roofs & aperture materials specified.	☐	☐
5. Calculations of U-values for walls and roofs.	☐	☐
6. Proposed Glazing specifications on Shading Coefficient, U-values and Visible Light Transmission.	☐	☐
7. Confirm provision of Energy Management System where air-conditioned space $\geq 4000\text{m}^2$.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As Built plans and elevations marking out walls & apertures used for the calculation-colored blue; and walls & apertures not used for calculation colored red.	☐	☐
2. OTTV calculations for each facing wall and roof	☐	☐
3. RTTV calculation (if applicable).	☐	☐
4. Description of built walls, roofs & aperture materials with U-values calculation.	☐	☐
5. Manufacturer issued glazing specification on shading coefficient, U-values and Visible Light Transmission	☐	☐
6. Description of as-installed Energy Management System and i/o schedule.	☐	☐
7. Describe any deviations or additions to the DA submission.	☐	☐

PROJECT NAME				DATE
SUBMITTING PROFESSIONAL	NAME	DESIGNATION	COMPANY	SIGNATURE
CLIENT	NAME	DESIGNATION	COMPANY	SIGNATURE

NOTE Attach all submittals with this Cover page

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE2	LIGHTING ZONING	3 POINTS
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INTENT

To provide flexible lighting controls to optimise energy savings.

DESCRIPTION

Encourage and recognise lighting design practices that offer greater flexibility for light switching, making it easier to light only occupied areas.

REQUIREMENTS

1 point: Awarded for all individual or enclosed spaces to be individually switched; and the size of individually switched lighting zones shall not exceed 100m² for 90% of the NLA; with switching clearly labelled and easily accessible by building occupants.

1 point: Awarded for provision of auto-sensor controlled lighting in conjunction with daylighting strategy for all perimeter zones and daylit areas, if any.

1 point: Awarded for provision of occupancy sensors or equivalent to complement lighting zoning for total area equivalent to at least 25% NLA.

APPROACH & IMPLEMENTATION

Decreasing the size of lighting zones allows for more flexible control over lighting giving owners/tenants the ability to reduce energy consumption and costs by only lighting those areas or zones that are occupied or required. However, for buildings with multi-occupancies with different tasks and applications, the performance and functionality of control type designs will be considered provided that reasonable justification is provided.

Application of motion sensors can be applied for area outside of NLA such as toilets, staircases etc.

POTENTIAL TECHNOLOGIES & STRATEGIES

Design lighting zones by increasing switching flexibility with controls by individual switches and/or automated sensing devices.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Drawings of floor plans clearly showing every proposed individually switched lighting zone and its coverage area.	☐	☐
2.	Electrical schematic drawings showing the locations and extent of switching, the area controlled by the switch and automated control sensing system detailed.	☐	☐
3.	Report to include the areas of all switched zones and confirmation that the total areas meet the percentage NLA requirements.	☐	☐
4.	Technical Specifications of sensors to be installed.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	As-Built Drawings of floor plans clearly showing each individually switched lighting zone and its coverage area.	☐	☐
2.	As-Built Electrical schematic drawings showing the locations and extent of switching, the area controlled by the switch and automated control sensing system detailed.	☐	☐
3.	Report to include the exact areas of all switched zones and confirmation that the total area meets the percentage NLA requirements.	☐	☐
4.	Manufacturer's technical Specifications of sensors installed	☐	☐
5.	Describe any deviations or additions to the DA submission.	☐	☐

PROJECT NAME				DATE
	NAME	DESIGNATION	COMPANY	SIGNATURE
SUBMITTING PROFESSIONAL				
CLIENT	NAME	DESIGNATION	COMPANY	SIGNATURE

NOTE Attach all submittals with this Cover page

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE3	ELECTRICAL SUB-METERING & TENANTS SUB-METERING	1 POINT
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INTENT

To monitor energy consumption of key building services as well as all tenancy areas.

DESCRIPTION

Encourage and recognise the provision of energy sub-metering to facilitate energy monitoring of base building services.

Encourage and recognise the provision of energy sub-metering to facilitate energy monitoring by tenants or end users.

REQUIREMENTS

1 point: 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.

APPROACH & IMPLEMENTATION

For typical buildings, separate metering shall be provided for car parks; chillers; AHUs; lifts; common area lighting and power and any additional item which carries an energy use $\geq 100\text{kVA}$.

For a speculative buildings, compliance is by demonstrating commitment and provision to install meters for separate tenancy areas. As a minimum this is to be provided on each floor and to each wing or other clearly separable tenancy area or zone.

Where Energy Management System (EMS) is provided, all meters should be linked to the EMS for monitoring and recording, and control where appropriate.

POTENTIAL TECHNOLOGIES & STRATEGIES

To use the Energy Management System (EMS) for measurement and management of energy usage including Maximum Demand Limiting.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. An extract from the specification detailing the requirements for electrical sub-meters.	☐	☐
2. Clearly marked electrical schematic drawings showing the proposed locations of meters and the usage served by those meters.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built Electrical schematic drawings showing the exact locations of meters and the building usage served by those meters.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE4**RENEWABLE ENERGY****5 POINTS****INTENT**

To promote the use of all forms of renewable energy so as to reduce environmental impact and emission of CO₂.

DESCRIPTION

The use of renewable energy systems will help to defer the need for power plant-up and promote green energy use. Calculate the project performance by expressing the energy produced by the renewable energy systems as a percentage of the building annual energy use. In the context of the built environment in Malaysia, the most likely form of renewable energy would derive from on-site photovoltaic (PV) installation such as Building Integrated Photovoltaic (BIPV) etc. Other forms of renewable energy are also applicable with their appropriate conversion into equivalent electrical energy for calculation purposes.

REQUIREMENTS

2 points: Awarded where 2 % of the total electricity consumption is generated by renewable energy, **OR**

3 points: Where 5 % of the total electricity consumption is generated by renewable energy, **OR**

4 points: Where 10 % of the total electricity consumption is generated by renewable energy, **OR**

5 points: Where 15 % of the total electricity consumption is generated by renewable energy.

Note: Electricity includes other form of energy.

APPROACH & IMPLEMENTATION

Assess the project for renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and other non-polluting technologies. Photovoltaic (PV) is highly recommended to be used to generate renewable electricity in non-residential buildings in Malaysian climate. The PV system can be grid connected or stand-alone system with or without battery pack to store excess energy production

POTENTIAL TECHNOLOGIES & STRATEGIES

Assess the project for non-polluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Plans and elevations marking out areas allocated to house renewable energy equipment.	☐	☐
2. Describe proposed technology to be used, including documenting total kWp or predicted equivalent energy in kWh.	☐	☐
3. Predicted total electricity consumption by the building and percentage of renewable energy to be generated.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built plans and elevations marking out installation location of renewable energy equipment.	☐	☐
2. Manufacturer's technical specification of the renewable energy equipment.	☐	☐
3. As-Measured kWp or equivalent renewable energy generated.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) ENERGY EFFICIENCY (EE)

EE5	ADVANCED EE PERFORMANCE	15 POINTS
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INTENT

To encourage enhancement of building EE performance thereby reducing CO₂ emission.

REQUIREMENTS

Up to 15 points are awarded where it is demonstrated that Energy Efficiency (EE) performance exceeds the baseline minimum to reduce energy consumption in the building.

PATHWAY 1: BENCHMARKING APPROACH

Achieve Building Energy Intensity (BEI) excluding On-Site Renewable Energy:

1 point	= BEI ≤ 180 kWh/m ² /year
2 points	= BEI ≤ 150 kWh/m ² /year
3 points	= BEI ≤ 140 kWh/m ² /year
5 points	= BEI ≤ 130 kWh/m ² /year
8 points	= BEI ≤ 120 kWh/m ² /year
10 points	= BEI ≤ 110 kWh/m ² /year
12 points	= BEI ≤ 100 kWh/m ² /year
15 points	= BEI ≤ 90 kWh/m ² /year

PATHWAY 2: PERFORMANCE BASED APPROACH

Achieve Percentage Reduction of Building Energy Consumption excluding On-Site Renewable Energy compared to MS1525 baseline:

1 point	= ≥ 15%,
2 points	= ≥ 30%,
3 points	= ≥ 35%,
5 points	= ≥ 40%,
8 points	= ≥ 45%,
10 points	= ≥ 50%,
12 points	= ≥ 55%,
15 points	= ≥ 60%

Note: BEI values given above are applicable to Office Buildings. Refer to GBI and BEI values for other categories of Non-Residential Buildings.

APPROACH & IMPLEMENTATION

Cutting edge technologies and materials should be fully explored for application. For passive design applications, consider use of better insulation materials, such as wall insulation of autoclaved lightweight concrete, composite insulated wall, double brickwall or other options. Glazing should be optimally sized and the use of performance glazing such as low-e and/or spectrally selective glazing is encouraged. Roof insulation should also be properly addressed. For active design applications, consider EE products for all components and educate users on need to reduce plug loads both in procurement policy and usage.

POTENTIAL TECHNOLOGIES & STRATEGIES

Design the building envelope and systems to maximize energy performance. Adopt the most energy efficient design concepts and strategies. Quantify BEI performance as compared to a baseline building with the aid of appropriate simulation software tools as appropriate.

Continued on next page >>

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE5	ADVANCED EE PERFORMANCE	15 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. All documentation provided for EE1 (cross referenced)	☐	☐
2. Submit predicted BEI calculations. (For GBI Certified or Silver rating, may use static energy calculation using manual method or software programs such as BEIT or other GBI approved software programs; for GBI Gold or Platinum, must use dynamic energy calculation using GBI approved software programs)	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Actual verified BEI achieved for completed building.	☐	☐
2. Actual EMS printouts.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE6

ENHANCED COMMISSIONING OF BUILDING ENERGY SYSTEMS

3 POINTS

INTENT

To ensure building's energy related system are designed and installed to achieve proper commissioning so as to realise their full potential and intent. This will serve to eliminate the bad practice of not fully commissioning the installed systems.

REQUIREMENTS

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 detailed 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 the requirements for training operating personnel and building occupants are completed.

APPROACH & IMPLEMENTATION

Appointment of a CxS from Design Development to Completion of the project. CxS to provide commissioning advice (including accessibility and maintainability provisions) to the Client and the design team and to monitor and verify commissioning of building's energy related systems.

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.

POTENTIAL TECHNOLOGIES & STRATEGIES

Installation of state-of-the-art measuring devices and sensors that will aid in commissioning and also enhance EE.

Continued on next page >>

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE6	ENHANCED COMMISSIONING OF BUILDING ENERGY SYSTEMS	3 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Confirmation letter from the CxS of his appointment and scope of works in accordance to CxS requirements.	☐	☐
2. Owner's Project Brief and Design team's Basis of Design should be submitted together with preliminary design review by the CxS.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Documentary evidence that the full scope of CxS works have been carried out during the contract administration phase.	☐	☐
2. The final commissioning report including recommendations to the client regarding the performance of the commissioned building energy related systems.	☐	☐
3. A copy of the systems manual as described in the CxS scope of works.	☐	☐
4. Documented evidence of training of building management staff.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE7	POST OCCUPANCY COMMISSIONING	2 POINTS
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INTENT

To ensure proper design and commissioning are carried out during and after fit-outs (if any) so that the intended EE and IEQ are fully sustained.

REQUIREMENTS

1 point: Awarded where design engineer reviews 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 point: Awarded where within 12 months of completion (or earlier if there is at least 50% occupancy), the CxS carries 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.

APPROACH & IMPLEMENTATION

Design engineers must check all fit-out designs. The CxS shall carry out the post occupancy commissioning of water, energy and IEQ systems for all tenancy areas after fit-out changes are completed.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Declaration that post-occupancy commissioning will be undertaken.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Document what has been approved and constructed for post-occupancy fit-out's.	☐	☐
2. CxS to verify recommissioning of post occupancy fit-out, if applicable.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE8	EE VERIFICATION	2 POINTS
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INTENT

To provide for the ongoing accountability of building energy consumption over time.

REQUIREMENTS

2 points: Awarded for the use of Energy Management Control System (EMCS) to monitor and analyse energy consumption including reading of sub-meters, **AND**

Fully commission EMCS including Maximum Demand Limiting programme within 12 months of practical completion (or earlier if there is at least 50% occupancy).

Compliance to both to attain the 2 points.

APPROACH & IMPLEMENTATION

For buildings with less than 4000m² of air-conditioned space and where an EMS is not required, the MDL programme may be achieved using other methods of installations. This should be achieved in conjunction with such as proper and regular monitoring of energy use and maximum demand over time.

	SUBMITTER	GBI
1. Declaration of commitment to carry out EE verification upon completion.	☐	☐

	SUBMITTER	GBI
1. Actual verified BEI achieved, Renewable Energy generated and Water consumption for completed building.	☐	☐
2. Where EMS is installed, comprehensive printouts of EMS results including Maximum Demand Limiting programme setting.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE9	SUSTAINABLE MAINTENANCE	2 POINTS
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INTENT

To ensure the building's energy related systems will continue to perform as intended beyond the 12 months Defects & Liability Period.

REQUIREMENTS

1 point : Awarded for providing a designated building maintenance office that is fully equipped with facilities (including tools and instrumentation) and inventory storage.

1 point : Awarded where at least 50% of permanent building maintenance team is on-board one (1) to three (3) months before practical completion and fully participate (to be specified in contract conditions) in the Testing & Commissioning of all building energy related systems, **AND**

Provision of evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget (inclusive of staffing and outsourced contracts).

APPROACH & IMPLEMENTATION

Ensure the maintenance team fully participates in the testing and commissioning stage, understand the design intent and provide a 3-year sustainable maintenance program.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)	SUBMITTER	GBI
1. Identify building maintenance room and facilities (storage room etc) in the design floor plan.	☐	☐
2. Commitment to engage at least 50% of permanent building maintenance team before practical completion with organisation chart and staff positions identified.	☐	☐
3. Commitment to provide evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget (inclusive of staffing and outsourced contracts).	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)	SUBMITTER	GB
1. Documentary evidence of engagement of 50% of the maintenance team one to three months before practical completion who are then involved in the full testing & commissioning of the building energy related systems. Maintenance team organization chart that comes with designation and name to be provided.	☐	☐
2. Identification of building maintenance room and facilities (storage room etc) on as-built floor plan. Comprehensive list of maintenance tools & instrumentation and inventory storage items.	☐	☐
3. Provide evidence of documented plan for at least 3-year facility maintenance and preventive maintenance budget for facility maintenance (inclusive of staffing and outsourced contracts). Budget shall be come with monetary figure.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

ENERGY EFFICIENCY (EE)

EE10	CONTINUOUS ENERGY MANAGEMENT	1 POINT
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INTENT

To promote the implementation of an Energy Management System (EnMS) based on continual improvement principles, enabling building owners and operators to establish energy policies, define performance objectives, monitor energy use, identify improvement opportunities, and sustain energy performance over the building life cycle.

REQUIREMENTS

Develop and implement Energy Management System (EnMS) in accordance with ISO50001 or equivalent within 12 months of practical completion.

APPROACH & IMPLEMENTATION

An effective Energy Management System (EnMS), consistent with the principles of ISO 50001, should incorporate the following key elements to drive continual improvement in energy performance:

- **Energy Policy:** Establish an energy policy that demonstrates top management's commitment and provides a clear framework for setting measurable energy objectives and targets.
- **Organisation:** Define roles, responsibilities, authorities, and governance structures to ensure effective implementation, accountability, and oversight of the EnMS.
- **Awareness and Engagement:** Develop staff competence through training and actively engage employees to foster an organisational culture that supports energy efficiency and continual improvement.
- **Energy Information System:** Implement energy monitoring, sub-metering, Energy Performance Indicators (EnPIs), and data analytics to measure performance, identify opportunities, detect anomalies, and support data-driven decision-making.
- **Communication:** Establish effective internal and external communication processes to share energy performance, promote awareness, and engage relevant stakeholders in achieving energy objectives.
- **Investment and Resource Planning:** Allocate adequate resources and implement a structured process to identify, evaluate, prioritise, and invest in projects that deliver sustained improvements in energy performance.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

SUBMITTER GBI

1.	Commitment to develop and implement Energy Management System (EnMS)	☐	☐
2.	Draft Energy Policy and proposed Energy Management Strategy	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

SUBMITTER GBI

1.	Energy Policy signed by top management, Energy Management Committee, EnMS manual and other relevant operational documents.	☐	☐
2.	Evidences to demonstrate that the EnMS has been implemented and is operational.	☐	☐
3.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
**INDOOR ENVIRONMENTAL
QUALITY (EQ)**

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ1	MINIMUM IAQ PERFORMANCE	1 POINT
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INTENT

To provide minimum IAQ performance in buildings to ensure the comfort and well-being of building occupants.

DESCRIPTION

Meet the minimum requirements of ventilation rate in ASHRAE 62.1 or the local building code, whichever is the more stringent.

REQUIREMENTS

Meet the minimum requirements specified in ASHRAE 62.1 or local building code whichever is stricter.

APPROACH & IMPLEMENTATION

Designing building ventilation system to meet the minimum requirement specified in ASHRAE 62.1 ensures adequate fresh air is available to occupants in the space. The Ventilation Rate Procedure or the Indoor Air Quality Procedures can be used to determine the minimum required ventilation rates for various applications. Ventilation Rate Procedure is more straight-forward to apply. The IAQ Procedure of ASHRAE 62.1 is a performance-based procedure that addresses designing the ventilation system to maintain acceptable levels of known contaminants.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Description of the project ventilation design.	☐	☐
2. Schematic to illustrate the project ventilation system design.	☐	☐
3. Summary table with calculations to illustrate how the delivered minimum outdoor airflow to each zone and the outdoor air intake for the system meet the requirements of ASHRAE 62.1 and/or local building code.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As built drawings to illustrate the project ventilation system design.	☐	☐
2. Summary report to describe the ventilation design and how it complies with ASHRAE 62.1 and/or the local building code including information regarding the outdoor air intake volumes and any special conditions that affect the project ventilation design.	☐	☐
3. Detailed calculations or simulations to show how the delivered minimum outdoor airflow to each zone and outdoor airflow intake for the system meet the requirements in ASHRAE 62.1 and/or the local building code.	☐	☐
4. Describe any deviation or addition to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ2	ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL	1 POINT
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INTENT

To minimize exposure of building occupants to Environmental Tobacco Smoke.

DESCRIPTION

Avoid health problems associated with tobacco smoke by preventing possible contamination in the building, thereby reducing health risks to occupants linked to "secondhand smoke".

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

Prohibit of smoking in air-conditioned public buildings is already mandatory under Malaysian Law. This criteria can be achieved by strictly enforcing prohibition of smoking in the building, through management policy and/or signage. If designated smoking areas are provided outside the building (this may include rooftop), ensure that the tobacco smoke does not enter the building of the ventilation system.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Description of strategies to be employed in the building to achieve this criteria (by means of management policy and/or signage proposal).	☐	☐
2. Plans showing the location of exterior designated smoking areas, if any.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built drawings identifying location of exterior designated smoking areas.	☐	☐
2. Summary report describing strategies undertaken to ensure prohibition of smoking indoors can be enforced and strategies implemented to ensure that tobacco smoke will not enter the building or ventilation system where exterior smoking area is provided.	☐	☐
3. Photographic evidence of strategies adopted.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ3	DEMAND CONTROLLED VENTILATION	1 POINT
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INTENT

To provide capacity for effective ventilation system monitoring and control to ensure the comfort and well-being of building occupants.

DESCRIPTION

Use carbon dioxide monitoring and control system to deliver the required outdoor air to the occupants to suit variation in occupancy.

REQUIREMENTS

Install carbon dioxide (CO₂) monitoring and control system with at least one (1) CO₂ sensor at main return air 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 CO₂ level $\leq$ 1,000 ppm.

APPROACH & IMPLEMENTATION

Use of carbon dioxide monitoring system is a typical energy conservation measure to ensure different spaces receive adequate outdoor air for their current occupancy and the ventilation system can adjust the ventilation rate to meet changing requirements. This helps ensure occupants will receive adequate outdoor air at all times.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submission of ventilation and control schematics together with description of how CO ₂ monitoring and controls are integrated into the ventilation design.	☐	☐
2. Technical specification of CO ₂ sensor.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built drawings showing the installed sensors and controls.	☐	☐
2. Summary report on the ventilation design and CO ₂ monitoring and control system including information regarding the location, quantity of installed sensors, the operational parameters and setpoints.	☐	☐
3. Manufacturer's technical specifications of as installed the CO ₂ sensor.	☐	☐
4. Photographic evidence of typical installations.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ4	INDOOR AIR POLLUTANTS	2 POINTS
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INTENT

To minimize detrimental impact on occupant health through the use of materials with low emitting materials.

DESCRIPTION

Encourage the use and specification of healthy materials and finishes which contain low emitting materials.

REQUIREMENTS

1 point : Use of low emitting materials for paint, coatings and carpet.

1 point : Use of low emitting materials for composite wood, insulation, walls, adhesive and sealant.

APPROACH & IMPLEMENTATION

The criteria requirements should be clearly stated in project specifications. Provide cut-sheets, material safety data sheets, certificates and test reports. Submittal of the compliance documentation is a pre-requisite for product approval. Although there is no requirement to include loose furniture for this credit, no control of this loose furniture may have an impact on Credit EQ13 and Credit EQ14 when actual site measurements and verifications are conducted for presence of VOCs and Formaldehyde.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Summary report identifying areas where the low emitting materials will be installed/applied and how the criteria compliance is to be met.	☐	☐
2. Proposed Tenancy Fit-out guideline, if applicable	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-built drawings or document to confirm the installation/ application of low-emitting materials.	☐	☐
2. List of products installed/applied and their specifications.	☐	☐
3. Manufacturer's information including data sheets, certificates, test reports etc to demonstrate criteria compliance.	☐	☐
4. Photographic evidence of each typical installation/ application.	☐	☐
5. Confirmed Tenancy Fit-out guidelines, if applicable.	☐	☐
6. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ5	MOULD PREVENTION	1 POINT
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INTENT

To prevent microbial contamination in the building to ensure the health and well-being of building occupants.

DESCRIPTION

Design systems which reduce the risk of mould growth and its associated detrimental impact on occupant health.

REQUIREMENTS

Demonstrate that the air-conditioning and mechanical 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 primary active reheat system (which consumes additional energy).

Ensure that excessive moisture in building is taken into consideration during design, and be controlled and monitored during construction and operation stages by control of the following:

- Rainwater leakage through roof and walls
- Infiltration of moist air
- Diffusion of moisture through walls, roof and floors
- Groundwater intrusion into basements and crawl spaces through walls and floors
- Leaking or burst pipes
- Indoor moisture sources
- Construction moisture

OR

The above mentioned measures are not necessary or applicable if the building is fully naturally ventilated.

APPROACH & IMPLEMENTATION

The most effective way to control indoor mould growth is through elimination of moisture. It is important to dry water damaged areas and items within 24 to 48 hours to prevent mould growth. Humidity in spaces and ductwork has to be controlled throughout construction and occupation of the building.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Summary report outlining the strategies adopted to meet the credit requirements for moisture control and monitoring during construction and operation stages.	☐	☐
2. ACMV technical information/specification to demonstrate system compliance.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built drawings or any documentation to confirm that design strategies have been carried out during construction for credit intent.	☐	☐
2. Manufacturer's information on all relevant materials and/or systems installed to verify credit compliance.	☐	☐
3. Documentation and/or photographic evidence during construction of the precautions taken for mould prevention during construction.	☐	☐
4. Provide hourly record for 24-hour period (during occupancy) of temperature and Relative Humidity measurements for at least two (2) typical areas.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ6	CONTINUOUS IAQ MONITORING	2 POINTS
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INTENT

To encourage the implementation of continuous IAQ monitoring systems that provide real-time information on indoor environmental conditions, enabling proactive management, early detection of IAQ issues, and continual improvement of occupant health and well-being.

DESCRIPTION

Continuous indoor air quality (IAQ) monitoring provides real-time information on key indoor environmental parameters, enabling building owners and facility managers to identify potential IAQ issues, optimise building operation, and maintain a healthy and comfortable indoor environment for occupants.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

Implement a continuous IAQ monitoring system integrated with BMS or a dedicated platform to monitor key IAQ parameters, provide real-time visibility of indoor environmental conditions, establish alert mechanisms, and support data-driven operational optimisation throughout the building lifecycle.

1. Monitor - Continuous Measurement of IAQ Performance

Install continuous IAQ monitoring devices at representative occupied areas to measure relevant indoor environmental parameters. The monitoring system shall provide reliable and continuous data collection to establish actual indoor environmental performance.

2. Analyse - Data Evaluation and Performance Assessment

Integrate IAQ data into a monitoring platform or Building Management System (BMS) to enable real-time visualisation, historical trend analysis, and performance evaluation. Data analytics shall be utilised to identify IAQ patterns, detect abnormal conditions, evaluate ventilation effectiveness, and support informed operational decisions.

3. Respond - Proactive Corrective Actions

Establish predefined IAQ thresholds, alarms, and response procedures to enable timely intervention when IAQ conditions deteriorate. Corrective actions may include adjustment of ventilation rates, optimisation of HVAC operation, improvement of filtration performance, or investigation of potential pollutant sources.

4. Improve - Continual Optimisation of Indoor Environmental Quality

Utilise monitoring data and operational feedback to identify improvement opportunities, optimise building systems, and enhance long-term IAQ performance. Regular review of IAQ trends shall support continual improvement throughout the building lifecycle.

5. Calibration and Maintenance

Establish procedures for sensor calibration, verification, and maintenance to ensure accuracy, reliability, and long-term effectiveness of the IAQ monitoring system.

Continued on next page >>

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ6	CONTINUOUS IAQ MONITORING	2 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Description of the proposed IAQ monitoring approach and response strategy	☐	☐
2. IAQ sensor layout drawings and I/O point list showing BMS integration	☐	☐
3. Technical cut-out information showing proposed IAQ sensor accuracy and calibration requirements.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-built IAQ sensor layout drawings.	☐	☐
2. Photographic evidence of installed sensors.	☐	☐
3. BMS screenshots and historical trend logs.	☐	☐
4. Examples of IAQ data analysis and trend evaluation.	☐	☐
5. Records of identified IAQ issues and corrective action taken.	☐	☐
6. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ7	THERMAL COMFORT: DESIGN & CONTROLLABILITY OF SYSTEMS	2 POINTS
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INTENT

To provide a thermal environment that is comfortable and supports the productivity and well-being of building occupants.

DESCRIPTION

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.

REQUIREMENTS

1 point : Design to ASHRAE 55 standards in conjunction with the relevant localised parameters as listed in MS 1525

1 point : Provide individual comfort control for $\geq 50\%$ of the building occupants to enable adjustments to suit individual task needs and preferences.

AND

Provide comfort system control for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences.

APPROACH & IMPLEMENTATION

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. The comfort system controls should be provided within the breathing zone and must be visible and easily accessible to the occupants.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Summary report of the design strategies undertaken to fulfill the requirements specified in ASHRAE 55 in conjunction with the relevant localised parameters as listed in MS 1525	☐	☐
2. Describe how the requirements on provision of individual control for at least 50% of building occupants and also provision of controls for shared multi-occupant spaces can be achieved.	☐	☐
3. Provide propose comfort system control information.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Summary report that includes information on the methods used to establish thermal conditions for the project and how the system design addresses the design criteria.	☐	☐
2. Provide hourly record for 72-hour period (during occupancy) of temperature measurement for at least two (2) typical and to verify the specified close thermal comfort condition.	☐	☐
3. Summary report (including product information) on the individual types of control and the controls for multi-occupant spaces that are installed to achieve the credit compliance.	☐	☐
4. Photographic evidence of each typical type of comfort system and control installed.	☐	☐
5. Describe any deviations or additions to the DA submission	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ8**INTEGRATED DAYLIGHTING DESIGN****3 POINTS****INTENT**

Provide good levels of daylighting for building occupants.

DESCRIPTION

Design and implement good level of diffused daylight into interior of building.

REQUIREMENTS**PATHWAY 1: STATIC SIMULATION METHOD**

1 point: Demonstrate that $\geq 30\%$ 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 point: 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).

PATHWAY 2: CLIMATE-BASED DAYLIGHT MODELING

3 points: Demonstrate by simulation $\geq 50\%$ 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.)

APPROACH & IMPLEMENTATION

Daylight system for building includes window, façade shading/light deflecting devices (e.g. lightshelves), roof lights and atrium spaces. The Daylight Factor is the ratio of indoor light level measured on the working plane to the outdoor light level during overcast conditions with no direct sun. For a daylight space, to ensure visual comfort, the lighting level should be fairly uniform with no great contrast.

Continued on next page >>

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ8	INTEGRATED DAYLIGHTING DESIGN	3 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

SUBMITTER

GBI

1. Summary report with diagrams, of the design daylight strategies including for glare control will be undertaken to meet the credit requirements.

☐☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

SUBMITTER

GBI

1. As-Built drawings and specifications demonstrating that the daylighting system has been constructed according to design drawings/specifications.
2. Typical floor plans with Daylight Factor measurement results.
3. Site plan incorporating height of existing buildings or planned buildings surrounding the building together with solar diagrams & sunpath.
4. Summary of Daylight Factor results.
5. Manufacturer's Information on the daylighting system used, if custom-made.
6. Furnish photographs of each type of typical device installed.
7. Describe any deviations or additions to the DA submission.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐

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INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ9	ELECTRIC LIGHTING DESIGN & QUALITY	1 POINT
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INTENT

To ensure office lighting level is not over-designed.

DESCRIPTION

Ensure office lighting level is designed in accordance to MS1525 for different types of spaces.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

The ambient lighting level should be designed in accordance with the illuminance level recommended in MS1525. Task lighting may be provided for occupants who require a higher lighting level either for their own preference or for various task needs.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Summary report of lighting design brief to illustrate how the credit will be met.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built drawings showing the lighting layout plans.	☐	☐
2. Photometric measurements to illustrate that the lighting level fulfils the credit requirement.	☐	☐
3. Furnish photographs of typical floor lighting installation.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ10	REDUCED FLICKERING	1 POINT
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INTENT

To provide a comfortable visual working environment for occupants.

DESCRIPTION

Increase workplace amenity by avoiding low frequency flickers.

REQUIREMENTS

Install low flicker luminaires for a minimum of 90% of NLA.

Where LED luminaires are used, they shall be:

- 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**
- 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

- 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.

APPROACH & IMPLEMENTATION

Specify high frequency ballasts in fluorescent luminaires. The use of high frequency ballasts in the range of 20kHz and higher will provide smoother, non-flickering lamp operation. At this frequency, the flicker is totally undetectable to the human eye and sensory faculty.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)	SUBMITTER	GBI
1. Description of design strategy to achieve installation of fluorescent luminaires for minimum 90% of NLA	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)	SUBMITTER	GBI
1. As-Built lighting plans to identify location of the 90% NLA of fluorescent luminaires installed with high frequency ballasts.	☐	☐
2. Manufacturer's information confirming the specifications of high frequency ballasts installed.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ11	EXTERNAL VIEWS	2 POINTS
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INTENT

To reduce eyestrain for building occupants by providing long distance views and visual connection to the outdoor.

DESCRIPTION

Provision of view to the outside for building occupants to achieve benefits of relaxation and connectivity with the outdoor environment.

REQUIREMENTS

1 point: Demonstrating that $\geq 60\%$ of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.

2 points: Demonstrating that $\geq 75\%$ of the NLA has a direct line of sight through vision glazing at a height of 1.2m from floor level.

APPROACH & IMPLEMENTATION

Column free spaces and low interior partitions should be designed if possible. Offices should locate open plan areas along the perimeter of the façade, while private offices and areas not regularly occupied should be placed at the core of the building. Maintaining the views for spaces near the core is the primary design objective.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Typical floor plans to identify how external view for the spaces is maintained.	☐	☐
2. Design strategy of the interior layout that will be designed or recommended to maintain view to the outside.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built plans including interior layout confirming that there is direct line of sight to outside through vision glazing between 0.8 and 2.2m above the finish floor level for the required spaces.	☐	☐
2. For buildings where fit-out is not done, recommended interior layout shall be provided to tenants.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ12	INTERNAL NOISE LEVELS	1 POINT
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INTENT

To ensure building is designed to maintain a comfortable acoustic environment for occupants.

DESCRIPTION

Maintain internal noise level at an acceptable and tolerable level.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

Excessive noise can cause discomfort to occupants. Some of the solutions to ensure acceptable noise level is maintained include:

- Specify acoustical ceiling
- Specify furniture with sound absorbing surfaces on both sides
- Locate photocopiers, fax machines away from the main office areas in a separate area
- Insulate partition cavities
- Mechanical equipment room to be located away from office and conference rooms

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Design report on strategies to ensure internal noise level is maintained at the prescribed levels.	☐	☐
2. Floor plans showing location of Core, M&E, and equipment rooms.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Report describing the measured internal and external noise sources and features installed to achieve required noise level.	☐	☐
2. As built drawings showing noise control features.	☐	☐
3. Manufacturer's data sheets of the acoustic materials used in building.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ13	IAQ BEFORE & DURING OCCUPANCY	2 POINTS
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INTENT

To maintain good Indoor Air Quality condition both before building occupancy and during building occupancy.

DESCRIPTION

Reduce indoor air quality problems resulting from the construction process in order to help sustain the comfort and well-being of building occupants.

REQUIREMENTS

1 point: Develop and implement an Indoor Air Quality Management Plan for the Pre-Occupancy Phase:

Option 1: Perform a building flush-out by supplying outdoor air to provide not less than 10 airchanges/hour (ACH) for at least 30 minutes operation before occupancy and continuous minimum 1 ACH during the initial 14 days occupancy of the completed building, **OR**

Option 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**

Option 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 point: During Occupancy Phase:

Where a permanent air flushing system of at least 10 airchanges/hour operation is installed for use during occupancy stage.

APPROACH & IMPLEMENTATION

Options 1 and 2, flush air procedure may begin once all construction work is completed. As the purpose of flushing out is to evacuate air-borne contaminants in the building, the most effective way is to use non-polluting interior materials as a source control.

Option 3, IAQ testing procedure to confirm that the major contaminants are below recognized acceptable levels. This helps to ensure good indoor air quality for occupants.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)	SUBMITTER	GBI
1. Summary report outlining the strategies and procedures to be taken to meet the credit requirements.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)	SUBMITTER	GBI
1. Report on building flush-out procedure including the actual dates of the flush-out.	☐	☐
2. If IAQ testing is carried out, a report to outline the procedures undertaken and the results of the testing to verify if the credit requirements are met or not. If not, corrective measures must be taken.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ14	POST OCCUPANCY COMFORT SURVEY: VERIFICATION	2 POINTS
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INTENT

To provide verification of the comfort of the occupants in the building.

DESCRIPTION

Conduct post occupancy comfort survey of the building occupants and to undertake measures to rectify the problems identified during the survey.

REQUIREMENTS

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.

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, CO2 level, VOCs, and particulate concentration.

APPROACH & IMPLEMENTATION

Provide a systematic process and system for occupants to provide feedback on their indoor environmental comfort. The survey should collect responses from a significant and representative sample of occupants. The subjective survey should be accompanied with objective measurements of the relevant environmental variables. Short term monitoring or spot measurements should be done once problem areas have been identified through the survey. Corrective actions should then be undertaken to rectify the problem areas identified to improve the indoor environmental conditions of the occupants.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Summary report of the strategies that will be undertaken to meet the credit compliance.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Survey questionnaire used to collect responses from the occupants.	☐	☐
2. Objective measurement plan illustrating the areas and measurements undertaken.	☐	☐
3. Analysis report of the results of the survey and measurements.	☐	☐
4. Corrective action plan and measures undertaken to rectify the problem.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ15	RESILIENT IAQ	1 POINT
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INTENT

To enhance building resilience against airborne infection risks by ensuring ventilation systems have the capability to provide enhanced indoor air quality performance during periods of elevated infection risk.

DESCRIPTION

This criterion encourages the design of adaptable ventilation systems that can operate under Infection Risk Management Mode (IRMM) to improve indoor air quality resilience. The system shall be capable of providing the minimum Equivalent Clean Airflow Rate (ECAi), referenced to ASHRAE Standard 241, based on occupancy and space conditions.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

Implement a ventilation strategy capable of operating under Infection Risk Management Mode (IRMM) to achieve the required Equivalent Clean Airflow Rate (ECAi) for infection risk mitigation.

The implementation shall include:

- Demonstration of minimum ECAi based on occupancy and space conditions, using the calculation methodology referenced in ASHRAE Standard 241.
- Provision of outdoor air ventilation, filtration, air cleaning, or other equivalent strategies to increase clean airflow delivery.
- Establishment of control strategies to activate and manage IRMM operation.
- Integration with BMS or monitoring systems where applicable.
- Provision of operational procedures for activation, management, and return to normal operation.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Resilient IAQ Strategy Report describing the proposed IRMM approach with ECAi calculation demonstrating compliance with the required clean airflow rate based on occupancy and space conditions.	☐	☐
2. HVAC design narrative describing ventilation, filtration, air cleaning and control strategies adopted.	☐	☐
3. Control philosophy and sequence of operation describing IRMM activation and operation.	☐	☐
4. HVAC equipment specifications including ventilation systems, filtration and air cleaning systems (where applicable)	☐	☐
5. BMS integration strategy (where applicable).	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-built HVAC documentation.	☐	☐
2. Functional Performance Test Reports verifying IRMM operation.	☐	☐
3. BMS screenshots demonstrating IRMM monitoring and control capability (where applicable).	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
**SUSTAINABLE SITE
PLANNING & MANAGEMENT
(SM)**

NOTE Attach all submittals with this Cover page

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM1	SITE SELECTION	1 POINT
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INTENT

To avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

DESCRIPTION

Minimize ecological damage to existing natural features, water bodies, flora and fauna.

REQUIREMENTS

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:

- Prime agricultural land as defined by the Structure Plan of the area or the National Physical Plan.
- Forest reserve or State Environmental Protection Zones that is specifically identified as habitat for any species found on the endangered lists.
- 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 the more stringent.
- 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.
- Previously undeveloped land that is within 20 m of lake, river, stream and tributary which support or could support wildlife or recreational use.
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is provided.

APPROACH & IMPLEMENTATION

During site selection process, give preference to sites that have low ecological value or are not environmentally sensitive. If unavoidable, locate the building in a suitable location and with a minimal footprint so as to minimize disruption of environmentally sensitive areas.

Select sites that are stable and not prone to destructive natural events like flooding, erosion or landslides.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Survey plan and Site Plan showing footprint of building and its setback dimensions in relationship to existing natural features such as lakes, rivers, streams, tributaries, beaches, etc.	☐	☐
2.	Recommended scale 1:500	☐	☐
REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	As-Built site plans showing footprint of building and dimensions in relationship to existing natural features such as lakes, rivers, streams, tributaries, beaches, etc.	☐	☐
2.	Recommended scale 1:500	☐	☐
3.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM2	BROWNFIELD REDEVELOPMENT	1 POINT
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INTENT

To redevelop and rehabilitate existing damaged or used site which is complicated by environmental contamination. This serves to channel development to brownfield sites thereby reducing pressure on opening up new greenfield sites.

DESCRIPTION

Existing damaged or contaminated sites are typically old industrial sites, old rubbish dumpsites, former mining land, former petrol stations, etc, where some industrial activities had taken place on the site.

REQUIREMENTS

Decontaminate a contaminated site, where the site was contaminated at the time of purchase, and undertake full remedial steps to decontaminate the site prior to construction.

APPROACH & IMPLEMENTATION

Conduct a soil condition test to determine the level of contamination.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Submit a brief historical report on the usage of the land and prepare a report certified by approved testing laboratory determining the level of contamination.	☐	☐
2.	Submit an EIA report containing the level of contamination and the proposed action to be taken, such as the removal and replacement of soil, and other actions deemed appropriate.	☐	☐
REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Submit report and photographs of works carried out during decontamination process.	☐	☐
2.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM3	DEVELOPMENT DENSITY & COMMUNITY CONNECTIVITY	2 POINTS
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INTENT

Channel development to urban area with existing infrastructure, protect greenfield and preserve habitat and natural resources.

DESCRIPTION

A higher density development or redevelopment will help minimise opening up new greenfield sites, to preserve existing habitat and natural resources, and minimise the use of private mode of transportation.

REQUIREMENTS

(A) 1 point : 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 20,300 m² per hectare net (87,000 ft² per acre net)

(B) 1 point : Community Connectivity

Construct a new building or renovate an existing building on a previously developed site **AND** within 1km of a residential zone or neighbourhood with an average density of 25 units per hectare net (10 units per acre net) **AND** within 1km of at least 10 Basic Services **AND** with pedestrian access between the building and the services.

Basic Services include, but are not limited to:

- Bank
- Place of Worship
- Convenience / Grocery
- Day Care
- Police Station
- Fire Station
- Beauty
- Hardware
- Laundry
- Library
- Medical / Dental
- Senior Care Facility
- Park
- Pharmacy
- Post Office
- Restaurant
- School
- Supermarket
- Theatre
- Community Centre
- Fitness Centre

APPROACH & IMPLEMENTATION

During site selection process, give preference to sites that are within an urban area, where existing infrastructure is available.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submit Gross Floor Area calculations and density calculations.	☐	☐
2. Take note that the density calculation must include the area of the project being built and is based on a typical four-storey town centre / commercial centre.	☐	☐
3. Site plan showing building location in connection to the above Basic Services, indicating covered walkways, pedestrian access and other connections like linkbridges and underground links. Provide legend for all Basic Services.	☐	☐
4. Proximity is determined by drawing a 1 km radius around the main building entrance on a site map and counting the services found within that radius.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Final As-Built density calculations.	☐	☐
2. As-built Site plan showing locations of all existing services, covered walkways, pedestrian access and other connections like linkbridges and underground links.	☐	☐
3. Provide legend colours to differentiate the types of services.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM4	ENVIRONMENT MANAGEMENT	2 POINTS
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INTENT

To conserve existing natural area and restore damaged area to provide habitat and promote biodiversity.
To maximize Open Space - Provide a high ratio of open space to development footprint to promote biodiversity.

DESCRIPTION

Encourage protection or restoration of the habitat and maximise the ecological diversity by introducing native or adaptive vegetation. Maximise potential for open spaces on grade or on rooftops. One useful strategy is to carefully place building to ensure minimum disruption to the existing ecosystems by minimizing the building footprint. Another is to restore the site area with native or adaptive vegetation; or by increasing the total area for planting by introducing planting on the roof.

Greenfield sites are those that are not previously developed or graded and remain in a natural state. Previously developed sites are those that previously contained building, roadway, parking lot, or were graded or altered by direct human activity.

REQUIREMENTS

Conserve existing natural area and restore damaged area to provide habitat and promote biodiversity.
Maximize Open Space by providing a high ratio of open space to development footprint to promote biodiversity:

(A) 1 point : 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.

(B) 1 point : 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.

APPROACH & IMPLEMENTATION

For previously developed or graded sites, during concept design for multi buildings development, ensure that the proposed buildings are located close to one another. This enables more land to be freed up for planting. For a single building development, minimise the footprint or plinth area for the same purpose.

For greenfield sites, similar approach is recommended.

Continued on next page >>

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM4	ENVIRONMENT MANAGEMENT	2 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Site plan showing setback dimensions, outlines of building plinth, hardscape and softscape areas (Landscape). (to scale)	☐	☐
2. Landscape plans showing the percentage area covered by native or adaptive vegetation. (to scale)	☐	☐
3. Name list of plants and characteristics.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built coloured Site Plan with mark outline of building plinth, hardscape and softscape areas.	☐	☐
2. Landscape As-Built plans showing the percentage area covered by nature or adaptive vegetation.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM5	EARTHWORKS – CONSTRUCTION ACTIVITY POLLUTION CONTROL	1 POINT
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INTENT

To reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.

DESCRIPTION

Construction sites are usually responsible for significant environmental pollution. Encourage the introduction of and implementation of a policy to achieve ALL 3 objectives of control soil erosion, sedimentation and surface run-off, and air pollution.

REQUIREMENTS

Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation by creating and implementing 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 ESC plan shall describe the measures implemented to accomplish the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving stream.
- Prevent polluting the air with dust and particulate matter.

APPROACH & IMPLEMENTATION

A proper ESC Plan should be adopted and understood by all consultants and owner early during design stage and captured in the tender for the works.

This is followed by a strict implementation of the ESC Plan during construction.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Submit Proposed ESC Plan.	☐	☐
REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Submit ESC report, complete with photographic evidence and site reports verified by qualified person.	☐	☐
2.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM6	QLASSIC	1 POINT
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INTENT

To achieve quality of workmanship in construction works by subscribing to CIDB's Quality Assessment System for Building Construction (QLASSIC).

DESCRIPTION

Reward for achieving minimum score of 70% using QLASSIC Assessment System.

REQUIREMENTS

Achieve quality of workmanship in construction works:

Subscribe to an independent method system to assess and evaluate quality of workmanship of building project based on CIDB's CIS 7: Quality Assessment System for Building Construction Work (QLASSIC). Project should achieve a minimum score of 70%.

APPROACH & IMPLEMENTATION

- In the Project Quality Plan, QLASSIC is to be adopted and understood by all consultants and owner early during design stage and captured in the tender for the works.
- All contractors and sub-contractors are to be aware of QLASSIC score targets (tender documentation).
- All contractors and sub-contractors are to be QLASSIC compliance at tender stage and Strict Implementation of QLASSIC during construction to be monitored by qualified persons.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)	SUBMITTER	GBI
1. Submit Project Quality Plan and commitment to subscribe to QLASSIC.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)	SUBMITTER	GBI
1. Certification by CIDB of score achieved.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM7	WORKERS' SITE AMENITIES	1 POINT
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INTENT

To reduce pollution from construction activities by controlling pollution from waste and rubbish from workers.

DESCRIPTION

Controlling Pollution from waste and rubbish from workers is as vital as that from all other construction processes.

REQUIREMENTS

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:

- Proper accommodation for construction workers at the site or at temporary rented accommodation nearby.
- Prevent pollution of storm sewer or receiving stream by having proper septic tank.
- Prevent polluting the surrounding area from open burning and proper disposal of domestic waste.
- Provide adequate health and hygiene facilities for workers on site.

APPROACH & IMPLEMENTATION

Site Amenities Plan is intended to achieve the objective of ensuring adequate health and hygiene facilities are available for workers in order to minimize pollution caused by workers.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Submit Site plan showing locations of all site staff and workers' amenities and health & hygiene facilities.	☐	☐
2.	Submit Building Plan of Site Amenities (to scale).	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Report, complete with photographic evidence and site reports verified by qualified person.	☐	☐
2.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM8	PUBLIC TRANSPORTATION ACCESS	1 POINT
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INTENT

To reduce pollution and land development impacts from automobile use.

DESCRIPTION

Reduce pollution and land development impacts from private car use. During site selection process, give preference to sites that are located within 1km radius of existing public transportation system.

REQUIREMENTS

Reduce pollution and land development impacts from automobile use:

- Locate project within 1 km of an existing, or planned and funded, commuter rail, light rail station, subway station, **OR**
- Locate project within 500 m of at least one bus stop.

APPROACH & IMPLEMENTATION

During concept design stage, plan the building in a manner whereby easy access is available for building users to commute using public transport.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submit Site plan showing the site and building orientation, and highlight the locations of existing and planned public transport facilities. (Aerial Google Map is acceptable). Mark the radii from the building entrance to the various transportation systems.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built Site Plan with marked up transportation system facilities and complete with photographic verification.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM9	GREEN VEHICLE PRIORITY & ELECTRIC VEHICLE INFRASTRUCTURE	1 POINT
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INTENT

To reduce pollution and land development impacts from automobile use.

DESCRIPTION

Provide preferred parking areas for green vehicles, thereby encouraging the use of such vehicles (e.g. hybrid or electric vehicles).

REQUIREMENTS

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 provided parking spaces. (up to a maximum of 20 bays).

APPROACH & IMPLEMENTATION

During concept design stage, set aside the required number of carpark bays to be provided for green vehicles.

To further encourage the usage of green vehicles, locate the required carpark bays near lift lobbies.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submit calculations of minimum required carpark bays (local zoning requirements).	☐	☐
2. Plans showing the locations and numbers of carpark bays reserved for green vehicles. Demonstrate the 5% of the total provided parking spaces.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Submit As-Built plans showing locations and the allocated 5% of the total provided parking spaces.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM10	PARKING CAPACITY	1 POINT
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INTENT

To reduce pollution and land development impacts from single occupancy vehicle use.

DESCRIPTION

Reward for not over-providing parking capacity. This is to encourage the use of public transport and carpools and reduce single occupancy private vehicle use. The environmental benefits of traveling by public transport include the reduction in the emission of greenhouse gases by private cars, thereby reducing urban pollution and traffic congestion.

REQUIREMENTS

Discourage over-provision of car parking capacity:

- Size parking capacity not exceeding the minimum local zoning requirements, **AND**
- Provide preferred parking for carpools or vanpools for 5% of the total provided parking spaces.

APPROACH & IMPLEMENTATION

During concept design stage, work out the minimum required number of carpark bays. Consult with and inform the local authorities at all times.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Submit detailed calculation showing the minimum number of carpark bays required by the local authorities, and the number of bays provided.	☐	☐
2.	Submit plans showing location for preferred parking for carpools or vanpools.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Submit final carpark calculations verified by qualified persons.	☐	☐
2.	Submit As-Built drawings indicating the preferred parking for carpools or vanpools.	☐	☐
3.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM11	STORMWATER DESIGN – QUANTITY & QUALITY CONTROL	1 POINT
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INTENT

To 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.

DESCRIPTION

Minimize impact of stormwater pollution due to development.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

During concept design stage, conduct a thorough site evaluation on hydrology of site and prepare a study to reduce the risk of water contamination to nearby water bodies by controlling the quality and quantity of stormwater runoff from the building.

Implement a stormwater management strategy in conformance with and satisfy the objectives of MASMA.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submit preliminary study report complying with MASMA requirements.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Report, complete with photographic evidence and site reports signed off by qualified person on final stormwater design and management.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM12

GREENERY & ROOF

2 POINTS

INTENT

To reduce heat island (thermal gradient difference between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

DESCRIPTION

- Minimize impact on microclimate and human wildlife habitat.
- Reward for achieving any option. Roof application includes roofs over individual parking lots and roofs over parking structures.
- The use of greenery on rooftops can help alleviate urban heat island effects through shading and evaporative cooling. It also enhances aesthetics to the surrounding and provides a more pleasant working environment, which is also discussed in Indoor Environment Quality.

REQUIREMENTS

Reduce heat island (thermal gradient difference between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat:

- Hardscape & Greenery Application:**
 - Provide any combination of the following strategies for 50% of the site hardscape (including sidewalks, courtyards, plazas and parking lots):
 - Shade (within 5 years of occupancy);
 - Paving materials with a Solar Reflectance Index (SRI) of at least 29;
 - Open grid pavement system;
- Roof Application:**
 - 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**
 - Install a vegetated roof for at least 50% of the roof area, **OR**
 - Install high albedo and vegetated roof surfaces that, in combination, meet the following criteria:
 - $(\text{Area of SRI Roof} / 0.75) + (\text{Area of vegetated roof} / 0.5) \geq \text{Total Roof Area}$
 - Roof Type Slope SRI
 - Low-Sloped Roof < 2:12 78
 - Steep-Sloped Roof > 2:12 29

APPROACH & IMPLEMENTATION

During concept design stage, ensure landscaping design is incorporated, and choice of materials with preferred SRI is considered. Where possible, introduce landscaping to exposed roof surfaces.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Submit Site plan and Roof Plan showing the extent of proposed hardscape and greenery (softscape) (To scale).	☐	☐
2. Section drawing of the rooftop showing details of built-up roof greenery (To scale)	☐	☐
3. List of names of native or adaptive vegetation and their characteristics.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As-Built plans and sections of roof (to scale). Submit list of materials used and their SRI values	☐	☐
2. Submit photographs of roof and materials.	☐	☐
3. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM13	BUILDING USER MANUAL	1 POINT
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INTENT

To document green building design features and strategies for user information and guide to sustain performance during occupation.

DESCRIPTION

A Building User Manual is intended to inform occupants about the active and passive design features that should be maintained throughout the lifespan of the building.

REQUIREMENTS

Provide a Building User Manual which documents all the passive and active features that are part of the building, and highlight all passive and active features that should not be downgraded.

APPROACH & IMPLEMENTATION

The preparation of the Building User Manual should commence during design concept stage and continue to be developed during all subsequent stages up to and including construction. Participation by all consultants and building owner is recommended.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Commitment to develop Building User Manual and furnish framework of contents.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Building User Manual.	☐	☐
2.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
MATERIALS AND RESOURCES
(MR)

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR1	MATERIALS REUSE AND SELECTION	1 POINT
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INTENT

To encourage designers to specify the usage of reused building materials in new buildings.

DESCRIPTION

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.

REQUIREMENTS

Where reused products/materials constitute $\geq 5\%$ of the project's total eligible permanent installed material cost

APPROACH & IMPLEMENTATION

The following approach can achieve this credit by using:

Reused Materials found on site: Fixed components such as doors, cabinetry, posts etc. that no longer serve their original function are refurbished, reconditioned and installed for a different use or in a different location.

Reused Materials found off site: Use of salvaged materials found off site. They must be previously used or they may be relocated from another facility.

Temporary structures: Temporary formwork, framing and structures etc that can be reused many times before disposal (5-10 cycles of usage) can also be included. If the temporary structures are not new procurement for this project but have been used previously in other project/s, state the number of re-use that are remaining (e.g. use of system formwork is encouraged).

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. List of anticipated reused or salvaged materials for the project.	☐	☐
2. Cost of each proposed reused or salvaged materials.	☐	☐
3. Establish the estimated Total Cost of the materials for the project.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Documentation during the construction stage including photographs of the reused materials.	☐	☐
2. List of reused or salvaged materials used in the project after completion and their locations in the building.	☐	☐
3. Cost of each reused or salvaged materials either based on actual cost paid or replacement value of the material.	☐	☐
4. Provide the Actual Total Cost of the materials in the project.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR2**RECYCLED CONTENT MATERIALS****1 POINT****INTENT**

To encourage designers to specify the usage of recycled content materials in new buildings.

DESCRIPTION

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).

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

The goal in using materials with recycled content should be established during the design phase. The project team must identify materials with recycled content and such availability should be coordinated (as early as possible) by the project team with the contractor, subcontractors and suppliers.

The quantum and value of the recycled content of the materials to the total material cost must be documented by the project team.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Calculation of the recycled content value of each material must be provided.	☐	☐
2. The percentage of post-consumer and/or pre-consumer recycled content can be established by cost: or by weight (converted to cost).	☐	☐
3. Information on the sources/suppliers on the materials with recycled content must be provided.	☐	☐
4. Submit estimated value of the materials with recycled content against the estimated total value of the materials for the project.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Documentation during the construction stage including photographs of the installed reused materials.	☐	☐
2. Calculation of the recycled content value of each material must be provided.	☐	☐
3. Information on the sources/suppliers on the materials with recycled content must be provided.	☐	☐
4. Calculate the total percentage (based on cost) value of the materials with recycled content against the actual total value of the materials for the project. The percentage of post-consumer and/or pre-consumer recycled content must be established by cost.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR3	REGIONAL MATERIALS	1 POINT
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INTENT

To encourage sourcing of regional materials to reduce environmental impacts due to transportation.

DESCRIPTION

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.

REQUIREMENTS

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500km radius 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.

APPROACH & IMPLEMENTATION

This credit must be evaluated early in the design process as materials and products that can be sourced locally can be established.

The contractors and suppliers to verify the availability of materials which are extracted/harvested/ recovered and manufactured locally. This will ensure that the project team is aware on the availability of such materials and give focus on the materials that will contribute the most to this credit.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. List of products that are extracted/harvested/recovered and manufactured within 500 km. of the project site.	☐	☐
2. Provide the following: - Name of the manufacturer, - Product cost, AND - The distance between the project site and the manufacturer.	☐	☐
3. Determine the estimated total Material Cost.	☐	☐
4. Calculate the percentage of regional materials used = Total Cost of Regional Materials (RM) / Total Material Cost (RM).	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. List of products that are extracted/harvested/recovered and manufactured within 500 km. of the project site after completion.	☐	☐
2. Provide the following: - Name of the manufacturer, - Product cost, AND - The distance between the project site and the manufacturer.	☐	☐
3. Determine the Actual Total Material Cost.	☐	☐
4. Calculate the percentage of regional materials used = Total Cost of Regional Materials (RM) / Total Material Cost (RM).	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR4**SUSTAINABLE TIMBER****1 POINT****INTENT**

To promote responsible forest management.

DESCRIPTION

Encourage environmentally responsible forest management.

REQUIREMENTS

Where $\geq 50\%$ of wood-based materials and products used are appropriately certified. These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. Include wood materials permanently installed and also temporarily purchased for the project. Materials must comply with the Forest Stewardship Council (FSC) and Malaysian Timber Certification Council (MTCC) requirements.

APPROACH & IMPLEMENTATION

Establish the volume and types of wood products used in the project. Check the availability of the wood species and products that complies with FSC and MTCC requirements by making contact with the local vendors, suppliers and manufacturers that provide the required certifications.

Provide a list of certified vendors, suppliers and manufacturers to the contract bidders.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**SUBMITTER****GBI**

- | | | | |
|----|---|-----------------------|-----------------------|
| 1. | List all new wood products specified in the project and identify which components are FSC and MTCC certified. | ☐ | ☐ |
| 2. | Indicate the estimated volume of each wood product. | ☐ | ☐ |

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)**SUBMITTER****GBI**

- | | | | |
|----|--|-----------------------|-----------------------|
| 1. | List all new wood products used in the project and identify which components are FSC and MTCC certified. | ☐ | ☐ |
| 2. | The volume of each wood product must be shown. | ☐ | ☐ |
| 3. | The vendor's chain-of-custody (COC) number must be shown in the invoice to verify FSC and MTCC certifications. | ☐ | ☐ |
| 4. | Describe any deviations or additions to the DA submission. | ☐ | ☐ |

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR5**STORAGE & COLLECTION OF RECYCLABLES****1 POINT****INTENT**

To provide dedicated areas and storage bins for non-hazardous materials for recycling during BOTH construction and building occupancy.

DESCRIPTION

Facilitate reduction of waste generated during construction and during building occupancy that is hauled and disposed off in landfills.

REQUIREMENTS

During Construction, provide dedicated area/s and storage for collection of non-hazardous materials for recycling, **AND**

During Building Occupancy, provide permanent recycle bins. The waste that should be collected as a minimum should include aluminium, paper, plastics, glass, corrugated cardboard and batteries.

APPROACH & IMPLEMENTATION

During construction, designate a dedicated area where on-site sorting of waste materials can be stored in separate skips for collection to recycling facilities. This is tied in with credit MR6: Construction Waste Management.

During Building Occupancy, designate storage areas for recyclable materials that are clearly labeled for recycling, placed within accessible reach of the building occupants and in a location with easy vehicular access to facilitate collection.

The size of the storage space allocated should be adequate to store the recyclable waste volume generated by the building occupants/operation.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**SUBMITTER****GBI**

1. Floor plans showing the proposed locations of the storage areas for recyclables and their proximity to the building entrance and vehicular access point/s.
2. Ensure that the space provided for recyclables is in addition to the storage space allocated for general waste.

☐☐☐☐**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)****SUBMITTER****GBI**

1. As-built plans showing the locations of the storage area for recyclables. The plans should indicate the proximity of the storage from the building entrance.
2. Photographs showing the location, size, storage provision and labeling of dedicated facilities during construction.
3. Describe any deviations or additions to the DA submission.

☐☐☐☐☐☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR6	CONSTRUCTION WASTE MANAGEMENT	1 POINT
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INTENT

To reduce and recycle construction waste materials and divert from disposal to landfills.

DESCRIPTION

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.

REQUIREMENTS

Recycle and/or salvage $\geq 50\%$ volume of non-hazardous construction debris.

APPROACH & IMPLEMENTATION

A waste management plan must be developed and types of construction waste identified. Excavated soil must be excluded in the calculation.

Identify construction haulers and recyclers to handle the designated construction waste and ensure that records are kept to verify that the materials diverted have been recycled or salvaged as intended.

Use of pre-cast reduces waste produced on site.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Tabulate the anticipated diverted/recycled/landfill waste and the estimated quantity of the diverted/recycled/landfill waste.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Submit verified record of truck loads of diverted/recycled/landfill waste against total truck loads, supported by copy of the construction waste management plan.	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR7**REFRIGERANTS & CLEAN AGENTS****2 POINTS****INTENT**

To demonstrate leadership in accelerating phase-out of all Ozone Depleting Substances. Recognise and promote use of low Global Warming Substances.

DESCRIPTION

Use environmentally-friendly Refrigerants and Clean Agents exceeding Malaysia's commitment to the Montreal & Kyoto protocols.

REQUIREMENTS

1 point: Use zero Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) < 700 refrigerants/clean agents;

1 point: Use non-synthetic (natural) refrigerants/clean agents with zero ODP and negligible Global Warming Potential (GWP).

APPROACH & IMPLEMENTATION

Use synthetic refrigerants (for HVAC) and clean agents (for fire fighting) with zero ODP such as HFCs that exceeds Malaysia's commitment to the Montreal & Kyoto protocols.

Use non-synthetic (natural) refrigerants (for HVAC) and clean agents (for fire fighting) with zero ODP and negligible Global Warming Potential (GWP) such as water, hydrocarbon, carbon dioxide, ammonia and etc (for HVAC); and nitrogen, argon, water mist and etc (for fire fighting).

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**SUBMITTER****GBI**

1. Submit proposed types of refrigerants and clean agents to be used and/or if no refrigerants or clean agents will be used.

☐☐**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)****SUBMITTER****GBI**

1. Submit list of as-installed refrigerants and clean agents.
2. Describe any deviations or additions to the DA submission.

☐☐☐☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

MR8	REDUCTION OF UPFRONT CARBON	3 POINTS
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INTENT

To reduce the greenhouse gas emissions embodied in building materials and construction works by measuring and reducing Upfront Carbon, in support of Malaysia's Nationally Determined Contribution and the national aspiration, set out in the Twelfth Malaysia Plan and the National Energy Transition Roadmap (NETR), to achieve net-zero emissions as early as 2050, and to build embodied carbon capability within the Malaysian construction industry.

DESCRIPTION

Upfront Carbon comprises the greenhouse gas emissions released before the building is occupied: raw material supply, transport and manufacturing (Modules A1–A3), transport to site (A4) and construction (A5), as defined in EN 15978 and ISO 21930. Quantify the Upfront Carbon through a whole-building embodied carbon assessment covering, as a minimum, the substructure, structural frame, floor slabs, roof structure, external walls and façade, and demonstrate the required percentage reduction against a baseline reference design representing standard Malaysian construction practice for the same building, reported in kgCO₂e/m² GFA.

REQUIREMENTS

- 1 point:** Use of Low Embodied Carbon Building Materials that leads to ≥10% reduction in Upfront Carbon,
- 1 point:** Use of Low Embodied Carbon Building Materials that leads to ≥20% reduction in Upfront Carbon,
- 1 point:** Use of Low Embodied Carbon Building Materials that leads to ≥30% reduction in Upfront Carbon.

Note: Reductions are measured against the baseline Upfront Carbon (Modules A1–A5), with both designs assessed on the same bill of quantities scope, system boundary and data sources.

APPROACH & IMPLEMENTATION

- Establish a baseline model of the same building designed to standard Malaysian practice (CEM I concrete to MS EN 197-1, average recycled content steel) at the earliest design stage, and assess both designs over Modules A1–A5 to MS ISO 14040 / MS ISO 14044 and EN 15978, or the RICS Whole Life Carbon Assessment methodology, using a consistent bill of quantities.
- Apply carbon emission factors in order of preference: product-specific EPDs (ISO 14025, ISO 21930, EN 15804, including the SIRIM QAS International EPD Scheme); the Malaysia Life Cycle Inventory Database (MY-LCID) by SIRIM; CIDB/JKR and GreenPASS coefficients; and the ICE Database or ecoinvent where Malaysian data is unavailable, with justification. Use the same hierarchy for both designs.
- No additional LCA software is required: a transparent spreadsheet is fully acceptable – quantities taken off the bill of quantities or drawings, a carbon factor with its cited source on each line, quantity × factor summed by element and module, in parallel baseline and proposed worksheets, all formulas visible and auditable by the GBI Certifier. Recognised tools (e.g. One Click LCA, EC3, or GreenPASS calculators) may be used where already available.
- Proven strategies in Malaysia: structural design optimisation; blended cements with GGBS or PFA to MS EN 197-1 (15–40% lower concrete carbon); high recycled content steel from Malaysian electric arc furnace mills; IBS precast; MTCS (PEFC-endorsed) or FSC certified and engineered timber; recycled aggregates; and local sourcing to reduce A4 transport emissions.
- Indicative guidance: ≥10% is achievable through cement substitution alone; ≥20% by adding structural efficiency and recycled steel; ≥30% through an integrated approach from concept stage, with the embodied carbon assessor appointed early.

Continued on next page >>

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
MATERIALS AND RESOURCES (MR)

MR8	REDUCTION OF UPFRONT CARBON	3 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Submit an Upfront Carbon assessment report (Modules A1-A5) covering both the baseline reference design and the proposed design, stating the assessment methodology (MS ISO 14040 / MS ISO 14044, EN 15978 or RICS WLCA), calculation tool, bill of quantities and carbon emission factors with their data sources (EPDs, MY-LCID, or GreenPASS coefficients, or ICE Database), and demonstrating the projected percentage reduction in Upfront Carbon.	☐	☐
2.	Submit a schedule of the proposed Low Embodied Carbon Building Materials with their specifications and supporting EPDs or manufacturer technical data.	☐	☐
REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Submit the finalised as-built Upfront Carbon assessment based on as-purchased material quantities and product-specific EPDs, supported by purchase or delivery records, verifying the percentage reduction in Upfront Carbon achieved.	☐	☐
2.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
WATER EFFICIENCY
(WE)

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE1	RAINWATER HARVESTING	2 POINTS
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INTENT

To encourage rainwater harvesting that will lead to reduction in potable water consumption.

DESCRIPTION

Maximise rainwater collection from rooftop or runoff rainwater systems for building consumption and/or irrigation.

REQUIREMENTS

Achieve the following percentage in reduction of potable water consumption:

1 point: For 15% or more reduction, **OR**

2 points: For 30% or more reduction.

Submit calculation demonstrating reduction in water consumption compared to the building base condition.

APPROACH & IMPLEMENTATION

The two (2) main approaches to rainwater harvesting are collection of runoff rainwater from surrounding site and roof top rainwater harvesting. Both systems require separate water storage tanks and additional pressure boosting equipment may be required. Gravity fed system is encouraged to avoid additional energy use for pumping. Use rainwater for non-potable applications such as toilets and urinal flushing, landscape irrigation, washing clothes etc.

Water purifying system may be necessary depending on the application and methodology of harvesting the rainwater. Where rainwater filtration/purification is required, use of ozone or activated oxygen in lieu of chlorine or other GHG chemicals, is preferred to obviate negative environmental impact.

Rainwater harvesting calculation method and parameters adopted using GBI recognized Standards, Codes or Guides are acceptable.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	A technical report describing the concept and details of rainwater collection, conveyance system (gutters/downpipes or equivalent), filtration system (if any), storage facility and distribution system.	☐	☐
2.	The technical report shall include schematics showing how the rainwater is to be harvested and utilised.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Final as-installed calculation of rainwater harvested, storage tank capacity and building usage distribution system.	☐	☐
2.	As Built drawings for rainwater harvesting system and storage tank location (Recommended scale 1:200).	☐	☐
3.	Furnish photographs of as installed main equipment and components.	☐	☐
4.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE2	WASTE WATER RECYCLING	2 POINTS
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INTENT

To encourage water recycling that will lead to reduction in potable water consumption.

DESCRIPTION

Encourage recycling of greywater and/or blackwater for building and irrigation use to reduce discharge to external sewer, thereby reducing the overall building potable water consumption.

Encourage and recognise building design that reduces water flow to sewerage treatment plants.

REQUIREMENTS

1 point: For 10% or more wastewater being treated and recycled, **OR**

2 points: For 30% or more wastewater being treated and recycled.

APPROACH & IMPLEMENTATION

Water treatment systems and re-use technology options are acceptable for treating greywater and blackwater. The treated water is then recycled for use in irrigation, toilet flushing etc. Sand filters can be a cost-effective treatment technique.

POTENTIAL TECHNOLOGIES & STRATEGIES

Consider channeling greywater from sinks, showers and other sources to wastewater treatment plant.

Options for on-site wastewater treatment include packaged biological nutrient removal systems and high efficiency filtration systems can be considered.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Preliminary calculation to demonstrate the percentage of wastewater to be treated and recycled.	☐	☐
2.	A technical report describing the concept and details of the recycling and treatment plant, conveyance system, storage facility and distribution system.	☐	☐
3.	The technical report shall include schematics showing how the wastewater is recycled, stored and utilised.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	Final as-installed calculation of the recycled and treated wastewater, storage tank capacity and distribution system.	☐	☐
2.	As Built drawings for wastewater recycling and treatment system, and storage tank location (to scale).	☐	☐
3.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE3	WATER EFFICIENT - IRRIGATION/ LANDSCAPING	2 POINTS
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INTENT

To encourage and recognise the design of landscaping system that minimises or does not require the use of potable water supply from the local water authority.

DESCRIPTION

The main aim is to reduce the consumption of potable water for landscape irrigation. This may be achieved through the use of native or adaptive plants to reduce potable water consumption.

REQUIREMENTS

- 1 point:** For reducing potable water consumption for landscape irrigation by 50% or more, **OR**
2 points: For not using potable water at all for landscape irrigation.

APPROACH & IMPLEMENTATION

Design a water-efficient landscape by selecting native or adaptive plants that require minimal water. Reduce or eliminate use of potable water for landscape irrigation system.

POTENTIAL TECHNOLOGIES & STRATEGIES

Perform soil / climate analysis to determine appropriate plant material and design the landscape with native or adaptive plants to reduce or eliminate irrigation requirements. Where irrigation is required, use high efficiency equipment and/or climate-based controllers.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. A brief description of the system with references to Guidelines used, calculations, and an explanation of how the system meets the requirement for the credit.	☐	☐
2. A brief report by a landscape architect detailing the selection of native adaptive vegetation and the water efficient irrigation system and demonstrating that it will meet all the requirements for the credit.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. As built plans showing the detail location of the planted native adaptive vegetation and installed water efficient irrigation system (to scale).	☐	☐
2. Calculation of the reduction of potable water for landscape irrigation.	☐	☐
3. Furnish photographs of the vegetation installed.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE4	WATER EFFICIENT FITTINGS	2 POINTS
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INTENT

To encourage reduction in potable water consumption through use of efficient devices.

REQUIREMENTS

- 1 point:** For reduction of 30% or more annual potable water consumption, **OR**
2 points: For reduction of 50% or more annual potable water consumption.

Submit calculation to demonstrate that the fittings selected will reduce the potable water consumption compared to the building base conditions.

APPROACH & IMPLEMENTATION

The use of water efficient water closets, wash hand basins or shower heads or systems which has the potential to reduce potable water consumption in the building.

Specify the use of automatic self-closing faucets, electronic or otherwise, to eliminate wastage through faucets left running unnecessarily.

Specify the use of modified waterless urinals.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. A brief description of the system and an explanation of how the system meets the requirement for the credit.	☐	☐
2. Submit proposed makes of the intended fittings.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Tabulation of all as-installed water efficient fittings and calculations to verify percentage of water saved to meet the requirement for the credit.	☐	☐
2. Submit manufacturer's details of the installed fittings.	☐	☐
3. Furnish photographs of each type of water efficient fittings as installed.	☐	☐
4. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE5	METERING & LEAK DETECTION SYSTEM	1 POINT
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INTENT

To encourage the design of systems that allows monitoring and management of water consumption.

REQUIREMENTS

For incorporation of sub-meters to monitor and manage major water usage systems such as cooling towers, irrigation, kitchens and tenant spaces, **AND**

For linking sub-meters to BAS to facilitate early detection of water leakage.

APPROACH & IMPLEMENTATION

Specify the provisions of sub-meters for major water consuming systems/equipment. Incorporate BAS monitoring system of sub-meters.

POTENTIAL TECHNOLOGIES & STRATEGIES

To incorporate provisions of analogue or digital flow water sub-meters.

Incorporation of BAS monitoring will enable early detection of water leakage and contain water wastage.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Describe proposed provision of sub-meters of all major water consuming system/equipment and interface with BAS.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Submit tabulated inventory of as-installed sub-meters.	☐	☐
2. As built plans of the building showing the location of sub-meters.	☐	☐
3. Furnish photographs of typical sub-meter installed.	☐	☐
4. Sample of actual BAS report recording consumption and simulated leakage.	☐	☐
5. Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

WATER EFFICIENCY (WE)

WE6	RESILIENT CLEAN WATER SUPPLY	1 POINT
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INTENT

To enhance building water resilience by encouraging conscious management of potable water demand, optimisation of non-potable water use, and provision of adequate on-site potable water storage to maintain essential building operations during temporary water supply disruptions.

DESCRIPTION

Conventional water storage provisions are often designed based on statutory requirements without consideration of actual potable water consumption patterns or the potential reduction of potable water demand through water efficiency measures and alternative water sources.

This criterion encourages project teams to evaluate the building's actual potable water dependency and implement water conservation strategies, such as rainwater harvesting, greywater reuse, and water-efficient fixtures, to reduce reliance on potable water. The required on-site potable water storage capacity shall be calculated based on the water-efficient building case and shall provide a minimum supply duration of three (3) days, ensuring building operation can be maintained during temporary water disruptions.

REQUIREMENTS

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.

APPROACH & IMPLEMENTATION

Develop a water resilience strategy that integrates potable water demand reduction, alternative water sources, and appropriate storage planning to ensure continuity of essential building operations during water supply interruptions.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)		SUBMITTER	GBI
1.	Comparison of potable water requirement based on water efficient design case against total potable water storage provided.	☐	☐
2.	Description of strategy to monitor and verify daily potable water consumption.		
3.	Plumbing drawings and schematics showing water storage tanks and sub meters provision		
REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)		SUBMITTER	GBI
1.	As-built plumbing drawings showing water tanks and sub meters provision	☐	☐
2.	Potable water consumption monitoring records	☐	☐
3.	Updated storage duration calculation based on verified average daily potable water consumption over a minimum monitoring period of 6 months.	☐	☐
4.	Describe any deviations or additions to the DA submission.	☐	☐

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)
INNOVATION
(IN)

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) INNOVATION (IN)

IN1	INNOVATION	6 POINTS
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INTENT

To provide opportunity for the project to be awarded points for exceptional performance above the requirements set by GBI rating system.

DESCRIPTION

Reward innovation and initiatives.

REQUIREMENTS

Encourage project team to score 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, for innovative ideas such as, but not limited to:

- 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;

Project team may submit any innovation not listed above to GBI for consideration and approval of credit point.

APPROACH & IMPLEMENTATION

During Concept Design Stage, commence discussions on all possible innovation ideas to be incorporated into the building early. Late incorporation of innovation ideas may be difficult and costly.

Continued on next page >>

NOTE Attach all submittals with this Cover page

NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) INNOVATION (IN)

IN1	INNOVATION	6 POINTS
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REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

	SUBMITTER	GBI
1. Provide calculation and drawings as supporting documentation.	☐	☐

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

	SUBMITTER	GBI
1. Full documentation and photographic evidence of each innovation	☐	☐
2. Describe any deviations or additions to the DA submission.	☐	☐

Note: Full documentation may consist of technical specifications, drawings, operation manuals and justification

PROJECT NAME				DATE
SUBMITTING PROFESSIONAL	NAME	DESIGNATION	COMPANY	SIGNATURE
CLIENT	NAME	DESIGNATION	COMPANY	SIGNATURE

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NON-RESIDENTIAL NEW CONSTRUCTION (NRNC) INNOVATION (IN)

IN2**GREEN BUILDING INDEX FACILITATOR****1 POINT****INTENT**

To support and encourage the design integration required for Green Building Index rated buildings and to streamline the application and certification process.

DESCRIPTION

Encourage and promote green technology service providers.

REQUIREMENTS

Support and encourage the design integration required for Green Building Index rated buildings and to streamline the application and certification process, where:

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. Name of the GBI Facilitator shall be inserted in GBI Application & Registration Form.

APPROACH & IMPLEMENTATION

Appoint a Green Building Index Facilitator early to assist in the concept design stage, and ensure that the Facilitator follows through the entire project.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**SUBMITTER****GBI**

1. Proof of appointment of the named GBI Facilitator.
2. GBI Facilitator to present DA submission to GBI Certifier.

☐☐☐☐**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)****SUBMITTER****GBI**

1. GBI Facilitator to present CVA submission to GBI Certifier.

☐☐

PROJECT NAME				DATE
	NAME	DESIGNATION	COMPANY	SIGNATURE
SUBMITTING PROFESSIONAL				
CLIENT	NAME	DESIGNATION	COMPANY	SIGNATURE

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ACKNOWLEDGEMENTS

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