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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 application form with Owner’s information, project contact details, project information and any supporting documents to Greenbuildingindex Sdn Bhd (GSB). Upon acceptance & approval of the application documentation, the registration fee will be confirmed dependent on the size of the project. On payment of fees, a GBI registration number will be given, and the terms and conditions duly signed between owner and GSB. A GBI Certifier will be assigned for the duration of the project.

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

GBI Terms & Conditions
An agreement setting out the terms and conditions between Project owner and Greenbuildingindex Sdn Bhd is to be duly signed at this stage.

STAGE 2 | DESIGN ASSESSMENT (DA)
Appraisal conducted upon the submission by the Project Design team / Client (Architect/Engineer/Building Owner or Developer directly or through a GBI Facilitator) of comprehensive design and other necessary documents for Green Building Index Assessment. After acceptance of registration from GBI, the Project Design team & client should proceed to collect information for each of the six criteria completing the submittal requirements described under each detailed sub-section. It is recommended that the information submitted is based on preconstruction information (i.e. tender documentation stage) when all parameters of the design have been finalised. A Provisional Design Assessment certificate is given at this stage. A summary Design Assessment (DA) checklist is provided to determine target scoring.
STAGE 3 | COMPLETION & VERIFICATION ASSESSMENT (CVA)
Appraisal conducted upon CPC of the project when all necessary documents are re-submitted according to as-built information and calculations by the Project Design Team / Client (Architect/Engineer/Building Owner or Developer directly or through a GBI Facilitator). The Completion & Verification Assessment confirms that the targeted criteria have been properly implemented and achieved, or otherwise, for the intended classification.

GBI verifies within 12 months of CPC (or CCC/OC/OP whichever is the later); or earlier, if occupancy is not less than 50%, on the project classification. The verification process involves verifying the actual measured energy and water use, sustainable measures, indoor comfort survey results and action plan, Building Manual and Sustainable Maintenance program. A full Certification is given at this stage. A summary Completion & Verification Assessment (CVA) checklist is provided to determine target scoring.

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 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.
INTERIORS
PROCEDURES
**STAGE 1**
**APPLICATION & REGISTRATION**

1. Complete and submit the Application & Registration Form to GSB with supporting documents.

   **Is the Application complete?**

   - **INCOMPLETE**
     - GSB to request for more information from Applicant
   - **COMPLETE**
     - GSB processes application and notifies Applicant of the Registration Fee

   **APPLICATION REGISTRATION**

   - Applicant to make the necessary Registration Fee payment to GSB and submit any other additional required information

   - GSB registers the application and gives a GBI Registration Number to the Applicant
     - GBI Agreement to be signed between GSB and Applicant

   - GSB assigns GBI Certifier at appropriate time

*GSB = Greenbuildingindex Sdn Bhd*
STAGE 2
DESIGN ASSESSMENT (DA)

Applicant to appoint their Project Coordinator/GBI Facilitator

Submit to GSB for Design Assessment (DA)
2 Hard Copies, 3 CDs

Request Additional Documents from Applicant

Is the DA Submission complete?

DA Assessment by Certifier

Issue letter of acknowledgement to Applicant

1st Review

GBI requests Information from Applicant

Applicant to resubmit DA

Additional information/documents received

2nd Review

Certifier to finalise DA

APPEAL

Appeal by Applicant?

GSB notifies Applicant of DA result

NO APPEAL

Issue letter of success & Provisional GBI Certificate to successful applicant

GSB records & publishes in GBI Register

*GSB = Greenbuildingindex Sdn Bhd
STAGE 3
COMPLETION & VERIFICATION ASSESSMENT (CVA)

Applicant to submit for Completion & Verification Assessment (CVA) upon completion of project

GBI Certifier undertakes CVA

GSB notifies Applicant of CVA result

APPEAL

• Fail
• Request Review for a Higher Rating

To Submit Appeal Form & Fees

Appeal by Applicant?

NO APPEAL

GSB records & publishes in GBI register
LAM issues GBI certificate to Applicant

*GSB = Greenbuildingindex Sdn Bhd
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#### PROJECT INFORMATION

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**PROJECT DESCRIPTION**

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- Line 2
- Line 3
INTERIORS

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TOTAL SCORE 100

GREEN BUILDING INDEX CLASSIFICATION

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### INTERIORS ASSESSMENT CRITERIA

#### SCORE SUMMARY

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TOTAL POINTS 100
CRITERIA SIGNATORIES

The Interiors Reference Guide is formatted in reference to the Interiors 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 Interiors 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 cover sheet of the individual criteria shall be attached with the documentation drawings, project narratives and technical submissions. The cover sheets shall be signed by the respective Lead Professional.

The table below lists out the corresponding signatories required for each criteria.

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<td>EE2</td>
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<td>Measurement, Verification &amp; EE Performance</td>
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<td>2</td>
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<td></td>
<td>EQ3</td>
<td>Thermal Comfort: Design &amp; Controllability of Systems</td>
<td>SP/C</td>
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<td>EQ6</td>
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<td>EQ12</td>
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<td>EQ13</td>
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</tr>
<tr>
<td>3</td>
<td>SM</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>SM1</td>
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<td>PSP/C</td>
</tr>
<tr>
<td></td>
<td>SM2</td>
<td>Refurbishment of Existing or Abandoned Interior Space</td>
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</tr>
<tr>
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<td>SM3</td>
<td>Public Transportation Access</td>
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</tr>
<tr>
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<td>Community Connectivity</td>
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</tr>
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<td>Sustainable Space Design</td>
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</tr>
<tr>
<td></td>
<td>SM6</td>
<td>Indoor Greenscape &amp; Indoor Water Feature</td>
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</tr>
<tr>
<td></td>
<td>SM7</td>
<td>Sustainable Construction</td>
<td>PSP/QS/C</td>
</tr>
<tr>
<td></td>
<td>SM8</td>
<td>Construction Pollution Control Policy</td>
<td>PSP/QS/C</td>
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<tr>
<td></td>
<td>SM9</td>
<td>Storage &amp; Collection of Recyclables</td>
<td>PSP/QS/C</td>
</tr>
<tr>
<td></td>
<td>SM10</td>
<td>Construction Waste Management</td>
<td>PSP/QS/C</td>
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<tr>
<td></td>
<td>SM11</td>
<td>Site Safety</td>
<td>PSP/SP/C</td>
</tr>
<tr>
<td></td>
<td>SM12</td>
<td>Green Procurement &amp; Operation Policy</td>
<td>PSP/S/C</td>
</tr>
<tr>
<td></td>
<td>SM13</td>
<td>Sustainable Maintenance &amp; Green Office Guide</td>
<td>PSP/S/C</td>
</tr>
</tbody>
</table>
All submission information shall be attached to their respective cover criteria sheet along with relevant signatures for each of the criteria. The criteria checklist is to be marked by the submitter on all project documentation as described under “Required Submission for Design Assessment (DA)” or “Required Submission for Completion & Verification Assessment (CVA)”. Please leave the GBI’s column for the administration of GSB. All documents must be duly verified and signed as part of the procedural requirements. GSB will return documents that are not submitted in full compliance for corrective action.

The following is the recommended format of all documents that will form the Design Assessment (DA) & Completion & Verification Assessment (CVA) submission;

1. All Drawings, Plans, Sections and Elevations to be formatted on A3 size paper, with respective scale or scales clearly indicated. Should drawings be too small for legibility, provide a key plan with part plans for full clarity of building information.
2. All Perspectives to fit A3 size paper.
3. All Reports to be A4 format. Signature of Qualified submitting professional should form part of the submission.
4. Clearly mark the Design Assessment Checklist or Completion & Verification Checklist on submission of documentations together with a Design Submission form.

All submission to be saved into CDROM pdf format. Two (2) hard copies and three (3) copies of CDROM are to be submitted to GSB.

PSP is defined as Architect, Engineer or Interior Designer (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.

<table>
<thead>
<tr>
<th>PART</th>
<th>CRITERIA</th>
<th>ITEM</th>
<th>REQUIRED SIGNATORIES</th>
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<tr>
<td>4</td>
<td>MATERIALS &amp; RESOURCES</td>
<td>MR1 Materials Reuse &amp; Selection</td>
<td>PSP/QS/C</td>
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<td>MR2 Recycled Content Materials</td>
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<td>MR3 Regional Materials</td>
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<td></td>
<td>MR4 Rapidly Renewable Materials &amp; Sustainable Timber</td>
<td>PSP/QS/C</td>
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<td></td>
<td></td>
<td>MR5 Material Manufacture &amp; Ingredients</td>
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<td>MR6 Refrigerants &amp; Clean Agents</td>
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<td>WATER EFFICIENCY</td>
<td>WE1 Water Efficient Landscaping &amp; Water Feature</td>
<td>SP/S/C</td>
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<td>WE2 Water Efficient Fittings</td>
<td>SP/C</td>
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<td>WE3 Drinking Water Quality</td>
<td>SP/S/C</td>
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<td>IN1 Innovation in Design &amp; Environmental Design Initiatives</td>
<td>PSP/SP/S/C/GBIF</td>
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<td></td>
<td></td>
<td>IN2 Green Building Index Accredited Facilitator</td>
<td>S/C/GBIF</td>
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SUBMISSION FORMAT
INTERIORS
ASSESSMENT CRITERIA
INTERIORS

ENERGY EFFICIENCY

(EE)
INTERIORS
ENERGY EFFICIENCY (EE)

EE1 ENGAGEMENT OF QUALIFIED PROFESSIONALS 2 POINTS

INTENT
Engaging qualified professionals to ensure the design, implementation, monitoring, and trouble shooting are properly carried out for the interior space.

DESCRIPTION
Apart from the Interior Designer, engage qualified professionals for the design, monitoring, and verification of the interior space.

The selection of a qualified professional team shall represent the other interior fit-out trades as listed below:

1. MEP Engineers
2. C & S Engineers
3. Commissioning Specialists
4. Sustainability Consultants
5. Quantity Surveyors

REQUIREMENTS
1 Point: Awarded for the appointment of a minimum 2 qualified professionals
1 Point: Awarded for pre and post construction/fit-out signoff of the designs, drawings and bill of quantities

APPROACH & IMPLEMENTATION
Engage qualified professionals for the design, monitoring and the verification of the interior space.

POTENTIAL TECHNOLOGIES & STRATEGIES
Options for choosing suitable professional in the industry for an interior space which is sustainable

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appointment letters of qualified professionals</td>
<td>O O</td>
</tr>
<tr>
<td>2. Pre construction/fit-out drawings endorsed by qualified professionals</td>
<td>O O</td>
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</table>

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. As-Built drawings endorsed by the qualified professionals</td>
<td>O O</td>
</tr>
<tr>
<td>2. Verification by qualified professionals</td>
<td>O O</td>
</tr>
</tbody>
</table>

NOTE ATTACH ALL SUBMITALS WITH THIS COVER PAGE
INTERIORS
ENERGY EFFICIENCY (EE)

EE2 | LIGHTING | 6 POINTS

INTENT
To provide flexible lighting controls to optimise energy savings. To specify and install energy efficient light fixtures for target lux levels on working plane.

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 30m², or zoned to suit the usage of the interior (to demonstrate) for the interior space. Switches to be clearly labelled and easily accessible by space 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 motion/proximity sensors or equivalent to complement lighting zoning and usage of interior space.

Points are awarded for average lighting power density throughout the interior space

1 Point: Lighting density less than 9W/m²
2 Points: Lighting density less than 7W/m²
3 Points: Lighting density less than 5W/m²

APPROACH & IMPLEMENTATION
Decreasing the size of lighting zones, and using automatic controls allow for more flexible controls, on demand, lighting giving occupants the ability to reduce energy consumption and costs by only lighting those areas or zones that are occupied or required.

POTENTIAL TECHNOLOGIES & STRATEGIES
Specifying and installing efficient light fixtures (for lux level required based on MS 1525:2007) is imperative in controlling the amount of energy use for lighting.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
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</thead>
<tbody>
<tr>
<td>1. Drawings of floor plans clearly showing every proposed individually switched lighting zone and its coverage area.</td>
<td></td>
</tr>
<tr>
<td>2. Electrical schematic drawings showing the locations and extent of switching, the area controlled by the switch and automated control sensing system detailed.</td>
<td></td>
</tr>
<tr>
<td>3. Lighting strategy report complete with lighting operation logic.</td>
<td></td>
</tr>
<tr>
<td>4. Average lighting power density calculation</td>
<td></td>
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</table>

REQUIRED SUBMISSION FOR COMPLETION VERIFICATION ASSESSMENT

<table>
<thead>
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<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>3. Report to include the exact areas of all switched zones.</td>
<td></td>
</tr>
<tr>
<td>4. Average lighting power density as built calculation</td>
<td></td>
</tr>
<tr>
<td>5. Report on deviations from design assessment</td>
<td></td>
</tr>
</tbody>
</table>

CONTINUED ON NEXT PAGE
INTERIORS

ENERGY EFFICIENCY (EE)

EE2 LIGHTING (CONTINUED) 6 POINTS

EXAMPLE - LIGHTING DENSITY CALCULATION

Average lighting power density is the sum of all the rated power of the light fixtures divided by the total interior space area.

Total Interior Area = 661 m²

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>2 x 26W (75) RECESSED MOUNTED FLUORESCENT FITTING C/W PARABOLIC METAL REFLECTOR</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>1 x 14W (75) BASE CHANNEL FLUORESCENT FITTING</td>
</tr>
<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>2 x 14W (75) RECESSED MOUNTED FLUORESCENT FITTING C/W PARABOLIC METAL REFLECTOR</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>1.6W BATT POWER WAVE LED RECESSED MOUNTED EMERGENCY LIGHT C/W 3 HOURS DURATION BATTERY BACK-UP AND CHARGER</td>
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<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>6&quot; DA 1 x 16W (75) RECESSED MOUNTED LED DOWNLIGHT FITTING</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>CLEAR ACRYLIC PANEL WITH ENGRAVED PICTOGRAM RELIGIOUS SENT LIGHT FITTING WITH 12 UNITS HIGH QUALITY SUPER BRIGHT LED C/W 3 HOURS DURATION BATTERY BACK-UP AND CHARGER</td>
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<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>1 x 26W (75) BASE CHANNEL FLUORESCENT FITTING</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>LUX SENSOR</td>
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<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>LED PENDANT LIGHT FITTING BY LUP</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>OCCUPANCY SENSOR</td>
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<tr>
<td><img src="image.png" alt="Diagram" /></td>
<td>LED WALL WASHER</td>
<td><img src="image.png" alt="Diagram" /></td>
<td>LED STRIP</td>
</tr>
</tbody>
</table>
Hence by calculating quantity within Interior space and calculating total connected lighting power

In this example, 1 point is awarded for lighting power density less than 9W/m²
INTERIORS
ENERGY EFFICIENCY (EE)

EE2  PLUG LOAD
(INTERIOR SPACES LARGER THAN 300 SQM)  6 POINTS

INTENT
Controlling energy within the interior space by ensuring that only the necessary equipment required for the productivity and comfort of the space occupants are plugged in and used. Only the most energy efficient equipment are specified and operated within the interior space.

DESCRIPTION
Encourage the occupants to procure and operate only energy efficient plugged equipment which are necessary for the operation of the space

REQUIREMENTS
1 Point: Awarded for demonstrating that all plugged equipment within the interior space has energy rating label from Suruhanjaya Tenaga or GBI acceptable third party certification AND adoption of energy efficient plugged equipment purchasing and operating policy in the operation of the space.

Points are awarded for average plug load density over the interior space

1 Point: Plug load density less than 12W/m²
3 Points: Plug load density less than 10W/m²
5 Points: Plug load density less than 8W/m²

APPROACH & IMPLEMENTATION
Use energy efficient equipment rated by Suruhanjaya Tenaga or other GBI approved third party certification in tandem with energy efficient equipment internal policy. Plug load density over the interior space is a gauge of the energy efficiency of plugged equipment.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Drawings or floor plans clearly showing every proposed plugged equipment location and rated power.
2. Efficient plugged equipment policy and strategy of use.
3. Calculation of plugged equipment average power density calculation

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. As-Built Drawings or floor plans clearly showing location and rated power of plugged equipment
2. Final efficient plug load policy and strategy of use
3. Copy of certificate or other tangible proof by means of labels for every plugged equipment which are used within the interior area
4. Final calculation of plugged equipment average power density
5. Report on deviations from design assessment

PROJECT NAME
SUBMITTING PROFESSIONAL
CLIENT

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS

ENERGY EFFICIENCY (EE)

EE2 PLUG LOAD (INTERIOR SPACES LARGER THAN 300 SQM) (CONTINUED) 6 POINTS

EXAMPLE - PLUG LOAD DENSITY CALCULATION

CONNECTED PLUG LOAD POWER DENSITY

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Brand</th>
<th>Model/Model Info</th>
<th>Qty. (nos.)</th>
<th>(W)/unit</th>
<th>Total (W)</th>
<th>Considered Load</th>
<th>Remarks</th>
<th>Website</th>
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<tbody>
<tr>
<td>1</td>
<td>Coffee Machine*</td>
<td>Delonghi</td>
<td>Magnifica</td>
<td>1</td>
<td>1350</td>
<td>1350</td>
<td>No</td>
<td></td>
<td><a href="http://www.delonghi.com">www.delonghi.com</a></td>
</tr>
<tr>
<td>2</td>
<td>Photocopy Machine*</td>
<td>Fuji Xerox</td>
<td>ApeosPortOfficeCentre iV</td>
<td>2</td>
<td>1780</td>
<td>3520</td>
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<td></td>
<td><a href="http://www.fujixerox.com.my">www.fujixerox.com.my</a></td>
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<tr>
<td>3</td>
<td>Desktop (CPU only)</td>
<td>Dell</td>
<td>OptiPlex SFF 990</td>
<td>8</td>
<td>240</td>
<td>1920</td>
<td>Yes</td>
<td></td>
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<tr>
<td>4</td>
<td>Laptop</td>
<td>Dell</td>
<td>E6410</td>
<td>20</td>
<td>90</td>
<td>1800</td>
<td>Yes</td>
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<td></td>
<td></td>
<td>Lenovo</td>
<td>T530</td>
<td>21</td>
<td>65</td>
<td>1365</td>
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<td></td>
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<tr>
<td>5</td>
<td>Dell Monitor</td>
<td>Dell</td>
<td>U2312HM</td>
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<td>30</td>
<td>450</td>
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<td>6</td>
<td>SmartBoard* (Big TV)</td>
<td>SMARTBoard</td>
<td>8084-G</td>
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<tr>
<td>7</td>
<td>Meeting Room Screen*</td>
<td>Sony</td>
<td>46X704A</td>
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<td>160</td>
<td>480</td>
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<td>50/60 Hz</td>
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<td>Plotter*</td>
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<td>iPF915</td>
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<td>Water Filter*</td>
<td>Panasonic</td>
<td>TK7583</td>
<td>1</td>
<td>130</td>
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<td>220V - 240V AC</td>
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<td>11</td>
<td>Shredder Machine*</td>
<td>Fellowes</td>
<td>99Ci</td>
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<td>470</td>
<td>470</td>
<td>No</td>
<td></td>
<td>220V - 240V AC</td>
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</table>

Total Wattage, W 5535
Floor Area, m² 661
Connected Plug Load Density, W/m² 8.37

*Items were excluded from the considered load as they are part of the common facilities and some of the items are used less than one hour per day

Average plug load power density is = 8.37 W/m²

In this example, the average plug load density is less than 10W/m², thus awarded with 3 points

For interior spaces 300m² and smaller, Lighting and plug load densities are summarized into power density, and shall be reflected as a single value. This value is then referred to the corresponding credit score under section EE2 for Interior spaces 300m² and smaller.
INTERIORS
ENERGY EFFICIENCY (EE)

EE2 | LIGHTING AND PLUG LOAD
INTERIOR SPACES 300 SQ. M AND SMALLER | 12 POINTS

INTENT
1. To provide flexible lighting controls to optimise energy savings. To specify and install energy efficient light fixtures for target lux levels on working plane.
2. Controlling energy within the interior space by ensuring that only the necessary equipment required for the productivity and comfort of the space occupants are plugged in and used. Only the most energy efficient equipment are specified and operated within the interior space.

DESCRIPTION
1. Encourage and recognise lighting design practices that offer greater flexibility for light switching, making it easier to light only occupied areas.
2. Encourage the occupants to procure and operate only energy efficient plugged equipment which are necessary for the operation of the space.

REQUIREMENTS

1 Point: Awarded for individual or enclosed spaces individually switched. For open spaces individual switches to be provided for control over space lighting use. Switches are to be clearly labelled and easily accessible. Demonstrate that lighting system is flexible for changes without disruption to operation.

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

1 Point: Awarded for provision of motion/proximity sensors or equivalent to complement lighting zoning and usage of interior space.

1 Point: Awarded if all plugged equipment have energy rating label from Suruhanjaya Tenaga or standards acceptable by GBI. Document policy on standby equipment load control, energy efficient equipment procurement and use of equipment.

Points are awarded for combined Lighting and Plug Load power density throughout the interior space:

2 Point: Lighting density less than 17W/m²
5 Points: Lighting density less than 12W/m²
8 Points: Lighting density less than 8W/m²

APPROACH & IMPLEMENTATION
Decreasing the size of lighting zones, and using automatic controls allow for more flexible controls, on demand, lighting giving occupants the ability to reduce energy consumption and costs by only lighting those areas or zones that are occupied or required.

POTENTIAL TECHNOLOGIES & STRATEGIES
Specifying and installing efficient light fixtures (for lux level required based on MS 1525:2007) is imperative in controlling the amount of energy use for lighting.

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# INTERIORS
## ENERGY EFFICIENCY (EE)

### LIGHTING AND PLUG LOAD (INTERIOR SPACES 300 SQ.M AND SMALLER) (CONTINUED)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Drawings or floor plans clearly showing every proposed individually switched lighting zone and its coverage area</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Electrical schematic drawings showing the locations and extent of switching, the area controlled by the switch and automated control sensing system detailed.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Lighting strategy report complete with lighting operation logic.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Drawings or floor plans clearly showing every proposed plugged equipment location and rated power</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Efficient plugged equipment policy and strategy of use.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Average lighting and plug load power density calculation</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REQUIRED SUBMISSION FOR COMPLETION &amp; VERIFICATION ASSESSMENT (CVA)</th>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. As-Built Drawings or floor plans clearly showing each individually switched lighting zone and its coverage area.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>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.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Report to include the exact areas of all switched zones.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Drawings or floor plans clearly showing location and rated power of plugged equipment</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Final efficient plug load policy and strategy of use</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Copy of certificate or other tangible proof by means of labels for every plugged equipment which are used within the interior area</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. Average lighting power density as built calculation</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. Final calculation of plugged equipment average power density</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9. Report on deviations from design assessment</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### PROJECT NAME

<table>
<thead>
<tr>
<th>DATE</th>
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</table>

### SUBMITTING PROFESSIONAL

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESIGNATION</th>
<th>COMPANY</th>
<th>SIGNATURE</th>
</tr>
</thead>
<tbody>
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</table>

### CLIENT

<table>
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<tr>
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</tr>
</thead>
<tbody>
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</tbody>
</table>

**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTENT
Air Conditioning is the biggest energy consumer in an office environment. The design of the air conditioning system to match the use of the space is therefore vital in ensuring energy use is kept to a minimum. In addition, the air conditioning equipment procured and installed within the conditioned space plays a big role in the energy efficiency of interior spaces.

DESCRIPTION
Encourage the adoption of on demand air conditioning systems for the interiors complete with on/off capabilities to suit the usage of interior spaces. Occupants are to procure and operate only energy efficient plugged equipment which are necessary for the operation of the space.

Design and Install air conditioning systems to suit space usage. It is recommended that the design addresses the following:

1. Dedicated unit/s (air supply or equipment) with on demand controls for fixed used area or rooms
2. Dedicated unit/s for perimeter zones which have higher heat loads than internal zones can consider combining perimeter and internal zone to a single unit/supply if it is a small space of 10 to 12 m²
3. Dedicated unit/s for internal zones
4. Multiple units for large spaces

REQUIREMENTS
1 Point: Provision of an on-demand control for air conditioning use for e.g. Multiple units for open spaces, Variable Air Volume (VAV) boxes, VAV diffusers etc.

1 Point: 5 Star MEPS Suruhanjaya Tenaga rating for all air conditioning equipment installed, or COP of the air conditioning equipment (including central plant) betters the minimum requirement stipulated in MS 1525 by 25%

2 Points: Air conditioning equipment/supply with on demand capability for perimeter zones and internal area.

2 Points: Air conditioning equipment/supply with on demand capability for area of different use and rooms.

APPROACH & IMPLEMENTATION
Identify areas which have different use and different air conditioning loads. Design and install on-demand capacity by means of separate air conditioning units or controllable air delivery for each usage. Perimeter with (higher solar loads) and the internal zones are served by dedicated equipment or air supply.

Open areas (perimeter and internal) should also be served by on demand multiple units or controllable air supply to match the internal load profile coming from the movement of people and varying tasks which are carried out in the conditioned space.

CONTINUED ON NEXT PAGE
INTERIORS
ENERGY EFFICIENCY (EE)

## EE3  AIR CONDITIONING SYSTEM (CONTINUED)  6 POINTS

### REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

<table>
<thead>
<tr>
<th></th>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Air conditioning layout drawings with clear showings the air conditioning zones.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>A report detailing the air conditioning efficiency strategy delineation of calculations complete with relevant documents to prove compliance with strategy.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Catalogues of installed equipment with the certificate/copy of the Suruhanjaya Tenaga certificate.</td>
<td></td>
</tr>
</tbody>
</table>

### REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

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<td></td>
</tr>
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<td>Catalogues of installed equipment with the certificate/copy of the Suruhanjaya Tenaga certificate.</td>
<td></td>
</tr>
</tbody>
</table>

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**NOTE:** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE.
INTERIORS
ENERGY EFFICIENCY (EE)

EE3  AIR CONDITIONING SYSTEM (CONTINUED)  6 POINTS

EXAMPLE

CONTINUED ON NEXT PAGE
INTERIORS

ENERGY EFFICIENCY (EE)

EE3 AIR CONDITIONING SYSTEM (CONTINUED) 6 POINTS

EXAMPLE

Figure 1: Suruhanjaya Tenaga Energy Efficiency Label
(Source: Suruhanjaya Tenaga)

<table>
<thead>
<tr>
<th>USA</th>
<th>Energy Star Labels (more stars mean less energy use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand</td>
<td>Star Rating (more stars mean lower energy consumption)</td>
</tr>
<tr>
<td>UK</td>
<td>Energy Star Rating (coloured code “A-G”. “A” means the most efficient and “G” the least efficient)</td>
</tr>
<tr>
<td>Australia</td>
<td>Energy Star Rating (the more the stars, the lower the energy consumption)</td>
</tr>
</tbody>
</table>

Figure 2: Other Acceptable Energy Efficiency Labels
(Source: Suruhanjaya Tenaga)
INTENT
Promote the capability for the measurement and verification of energy usage for the interior spaces. Encourage the provision of meters for energy components and the collection of data for monitoring and tracking the energy usage of the space. Use this data to compute the required Space Energy Intensity (SEI) to benchmark against industry norms.

DESCRIPTION
Encourage awareness and quantification of energy use within interior spaces to further refine the energy efficiency of the space, and identifying the actual use of energy. Energy use for all components to be monitored, and SEI to be calculated for benchmarking against other interior spaces.

REQUIREMENTS
1 Point: Provision of meters for energy components or obtaining quantum of energy components from base building

1 Point: SEI < 130 kWh/m²/ year
2 Points: SEI < 120 kWh/m²/ year
3 Points: SEI < 115 kWh/m²/ year
4 Points: SEI < 100 kWh/m²/ year
5 Points: SEI < 90 kWh/m²/ year
6 Points: SEI < 85 kWh/m²/ year
7 Points: SEI < 75 kWh/m²/ year

APPROACH AND IMPLEMENTATION
Design and install electrical meters to monitor the use of the following:

1. Lighting
2. Plug Load
3. Air Conditioning System

In interior spaces where metering is provided by the base building, meters are to be installed, and used in conjunction with the base building meter provided for energy use identification and calculation of SEI.

For interior spaces which are air conditioned through centralised systems, the energy use from the air conditioning system in use is to be obtained from the base building operator, and be included in the calculation of SEI. When this is not possible, projected calculation may be used to estimate the energy use by the centralised air conditioning system.

Space Energy Intensity is defined follows:

SEI = Total Space Energy Consumption per year / Interior Space Area

Where,

Total Space Energy Consumption per year

Total amount of energy used per year from all services required to operate the space (i.e. Air Conditioning, Electrical Lighting, Plugged Load)

SEI is to be calculated within the official operating hours.

The SEI may be rationalised for benchmarking against the industry through the following;

Benchmark operating hours 2700 hours per year

The calculated SEI over official working hours x Operation Hours Factor (referable below)
INTERIORS
ENERGY EFFICIENCY (EE)

EE4 MEASUREMENT, VERIFICATION AND EE PERFORMANCE (CONTINUED) 8 POINTS

<table>
<thead>
<tr>
<th>TABLE 1: OPERATION HOURS FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Operating Hours</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>2100</td>
</tr>
<tr>
<td>2400</td>
</tr>
<tr>
<td>2700</td>
</tr>
<tr>
<td>3000</td>
</tr>
<tr>
<td>3300</td>
</tr>
</tbody>
</table>

Space Energy Intensity to obtain credits for benchmarking are proportionate to Building Energy Intensity used for whole building assessment for energy use.

Derivation of SEI benchmark values are as per Table 2.

<table>
<thead>
<tr>
<th>TABLE 2: SEI BENCHMARK (OFFICE 2700 HOURS OPERATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEI</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>100%</td>
</tr>
<tr>
<td>150</td>
</tr>
<tr>
<td>140</td>
</tr>
<tr>
<td>135</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td>110</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>90</td>
</tr>
</tbody>
</table>

Thus, SEI Values Scores

<table>
<thead>
<tr>
<th>SEI</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>1</td>
</tr>
<tr>
<td>120</td>
<td>2</td>
</tr>
<tr>
<td>115</td>
<td>3</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>90</td>
<td>5</td>
</tr>
<tr>
<td>85</td>
<td>6</td>
</tr>
<tr>
<td>75</td>
<td>7</td>
</tr>
</tbody>
</table>

The SEI component of BEI makes up 55% of total and for NLA only.

EXAMPLE SPACE ENERGY INTENSITY (SEI) CALCULATION

1. Yearly Electricity Usage (Lighting & Plug Load) 18,529.56 kWh/yr
2. Yearly AC Energy Usage 39,851.05 kWh/yr
   AC Energy Consists of:
   a) Chilled Water Load 31,622.36 kWh/yr
   b) Fan Load 8,228.69 kWh/yr
3. Total Energy Usage 58,380.61 kWh/yr
4. Office Floor Area 661.00 m²
5. SEI 88.32 kWh/m²/yr
6. Office Operational Hours 3,000.00 hrs
7. Correction Factor 0.90
8. Corrected SEI 79.49 kWh/m²/yr

SEI < 80kWh/m²/yr = 7 Points

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Electrical Schematic Diagrams for electrical metering
2. Report on how the SEI is to be obtained and rationalised.
3. Calculation / Simulation for anticipated SEI

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. As built Electrical Schematic Diagrams for electrical metering
2. Bills, meter readings and calculation for final SEI

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

<table>
<thead>
<tr>
<th>EQ1</th>
<th>MINIMUM IAQ PERFORMANCE</th>
<th>2 POINTS</th>
</tr>
</thead>
</table>

**INTENT**
To determine the present IAQ condition in the tenanted space and to implement an active IAQ management program to ensure the comfort and well-being of the occupants in tenanted spaces.

**DESCRIPTION**
1. Carry out an internal indoor air quality (IAQ) audit to determine present IAQ condition in the tenanted spaces and to meet the minimum requirements of ventilation rate in ASHRAE 2013 62.1 – 2013 or the local building code, whichever is more stringent.
2. Develop an active IAQ management plan to meet the IAQ parameters and to meet the minimum requirements of ventilation rate in ASHRAE 2013 62.1 – 2013 or the local building code, whichever is more stringent.

**REQUIREMENTS**
Carry out an indoor air quality audit and to develop an active IAQ management program to meet the minimum requirements specified in ASHRAE 62.1-2013 or local building code whichever is stricter. The IAQ parameters are temperature, relative humidity, carbon dioxide, formaldehyde, TVOCs and O3.

**APPROACH & IMPLEMENTATION**
Carry out an internal air quality audit to determine the present IAQ condition in the tenanted space to ensure the health and well-being of the occupants. Undertake improvement measures to meet the failed parameters and carry out IAQ tests to verify efficacy of the improvement measures.

Designing building ventilation system to meet the minimum requirement specified in ASHRAE 62.1-2013 ensures adequate fresh air is available to occupants in the tenanted 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)**
1. Provide internal air quality report undertaken before and after implementation of IAQ management program.
2. Description of the improvement measures to meet the failed parameters.
3. Description of the project ventilation design.
4. Schematic to illustrate the project ventilation system design.
5. Summary table with calculations to illustrate how the delivered minimum outdoor airflow to each tenanted space and the outdoor air intake for the system meet the requirements of ASHRAE 62.1 and/or local code.

**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)**
1. Audited report of measured parameters before and after implementation of improvement measures to meet the failed parameters.
2. As built drawings to illustrate the project ventilation system design.
3. Summary report to describe the ventilation design and how it complies with ASHRAE 62.1 and/or the local code including information regarding the fresh air intake volumes and any special conditions that affect the project ventilation design.
4. Detailed calculations or simulations to show how the delivered minimum outdoor airflow to each tenanted space and outdoor airflow air intake for the system meet the requirements in ASHRAE and/or local code.
5. Describe any deviation or addition to the DA submission.

**PROJECT NAME**

<table>
<thead>
<tr>
<th>SUBMITTING PROFESSIONAL</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>NAME</td>
<td>DESIGNATION</td>
</tr>
</tbody>
</table>

**CLIENT**

| NAME | DESIGNATION | COMPANY | SIGNATURE |

**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

MINIMUM IAQ PERFORMANCE
(CONTINUED) 2 POINTS

EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Carry out an air quality (IAQ) audit to determine present IAQ condition in the</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>tenanted space to ensure the health and well-being of occupants. If the IAQ Audit</td>
<td></td>
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<tr>
<td>results failed to meet specified parameters of the point-checks, undertake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>improvement measures to meet the failed parameters and carry out IAQ Tests to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>verify efficacy of the improvement measures.(1 Point)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Develop and implement an active IAQ management program: When tenants do not</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>have control or responsibility over the ACMV system, the ventilation rate in ASHRAE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62.1:2010 or local building code (or other equivalent codes and regulations</td>
<td></td>
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<tr>
<td>recognized by the GBI) shall be referred to as a guided mechanism for the</td>
<td></td>
<td></td>
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<tr>
<td>measurement of the IAQ performances.</td>
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<td></td>
</tr>
</tbody>
</table>

2. Narrative

A. IAQ test has been carried out for the office area and the results are attached.

B. In general, all point used in the office shall be reviewed in reference to IAQ compliance such as low VOC paint, dust free, formaldehyde free and others related criteria. The same principles shall be applied to any renovation and fit-out works carried out in the office, in which low VOC paint, and formaldehyde free materials shall be used, along with adequate mechanical ventilation to the working area for the removal of dust & polluted air. Some elements of these requirements is in the Green Office Guide. All enclosed areas are fitted with CO2 sensors and in the event CO2 levels are above 1000ppm, office personnel are trained to keep the doors open until the CO2 levels are below the threshold. If CO2 levels remain above 1000ppm for prolonged periods, we will check the CO2 monitors in the AHU rooms and contact the management office for remedial actions.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

INTENT
To minimize detrimental impact on occupant health through the use of materials with minimal volatile organic compounds (VOC) and formaldehyde content and to promote a healthy indoor environment.

DESCRIPTION
Minimise airborne contaminants, mainly from inside sources to promote a healthy indoor environment.

REQUIREMENTS
1 Point: Purchase and use of sustainable and environmentally friendly products recognised by approved local certification body or equivalent environmental certification (where applicable) for ceiling, walls, floor, furniture/finishes, furnishings and fittings.

1 Point:
1. Where applicable all new paints and surface coverings shall use low VOC emission paints and coating throughout the building. Paints and Coatings to comply with requirements specified in international labelling schemes recognized by GBI, AND
2. Where applicable all new flooring coverings shall use low VOC emission flooring materials throughout the building. Flooring materials to comply with requirements specified in international labelling schemes recognised by GBI. Carpets to comply with requirements specified in international labelling schemes recognized by GBI. Other types of flooring to comply with requirements under Floor Score developed by Science Certification System or equivalent, AND
3. Use low VOC adhesive and sealant or no adhesive or sealant used. Adhesives and sealants to comply with requirements specified in international labelling schemes recognised by GBI.

1 Point: Use products with no added urea formaldehyde. These include:
1. Composite wood and agrifiber products defined as: particleboard, medium density fiber board (MDF), plywood, wheat board, strawboard, panel substrates and door cores, AND
2. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies, AND
3. Insulation foam, AND
4. Draperies

APPROACH & IMPLEMENTATION
1. The credit 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.
2. All materials (including adhesive) should be tested and certified by independent laboratories prior to installation with certifications and/or test reports based on ASTM D5116 – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials / Products and/or ASTM D6670 – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials / Products or equivalent. The test shall define the total response of individual VOCs based on the listing of measured carcinogens and reproductive toxins identified by the local health authorities or the International Agency on Research on Cancer (IARC).

CONTINUED ON NEXT PAGE
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

**EQ2  INDOOR AIR POLLUTANTS (CONTINUED)  3 POINTS**

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

<table>
<thead>
<tr>
<th>SUBMITTER</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Summary report identifying areas where the low VOC materials will be installed and how the credit compliance is to be met.</td>
<td>☐</td>
</tr>
<tr>
<td>2. Detailed list of relevant certifications and/or test reports referring to the chemical emissions of the respective surface materials.</td>
<td>☐</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interiors built drawings showing where low VOC materials or products are used.</td>
<td>☐</td>
</tr>
<tr>
<td>2. List of products installed that meet the credit requirements, and their specifications.</td>
<td>☐</td>
</tr>
<tr>
<td>3. Manufacturer’s information including data sheets, certificates, test reports etc to demonstrate credit compliance.</td>
<td>☐</td>
</tr>
<tr>
<td>4. Photographic evidence of each typical low VOC installation.</td>
<td>☐</td>
</tr>
<tr>
<td>5. Describe any deviations or additions to the DA submission.</td>
<td>☐</td>
</tr>
</tbody>
</table>

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<tr>
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<td>NAME</td>
</tr>
<tr>
<td>CLIENT</td>
<td>NAME</td>
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**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
**EXAMPLE**

1. **Credit Compliance**

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<tbody>
<tr>
<td>A. Minimise airborne contaminants, mainly from inside sources to promote a healthy indoor environment. Purchase and use of sustainable and environmentally friendly products recognized by approved local certification body or equivalent environmental certification. 1) Ceiling 2) Wall 3) Floor 4) Furniture/Finishes/Furnishing AND Fittings Setting of sustainable and environmentally friendly procurement and purchasing policy.</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>B. Use low VOC emission paint and wall coverings throughout the building. Paints and wall coverings to comply with requirements specified in international labelling schemes recognized by GBI, AND Use low VOC emission flooring materials throughout the building. Flooring materials to comply with requirements specified in international labelling schemes recognized by GBI, AND Use low VOC emission adhesive and sealant or no adhesive or sealant used.</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>C. Use products with no added urea formaldehyde. These include: 1) Composite wood and agrifiber products defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores, AND 2) Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies, AND 3) Insulation foam, AND 4) Draperies</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. **Narrative**

A. The health and wellbeing of employees is very important, therefore the indoor environment was designed to address the concerns typically associated with working extended hours in the office. By procuring and using the low VOC finishes and materials for the office such as carpet, bamboo floor, paint, ceiling board and furniture, more than 95% of the interior fit-out meet the requirement on the Minimum IAQ Performance.

B. In addition to the above matters, paint and wall coverings and flooring materials used for the office are also low in VOC emissions and they are recognised by GBI.

C. The certifications of the materials used in the office fit-out are submitted.
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ2  INDOOR AIR POLLUTANTS (CONTINUED)  3 POINTS

EXAMPLE

FURNITURE LAYOUT PLAN
TOTAL AREA: 7,144 SQ.FT. | 660
SCALE: 1:50

REFLECTED CEILING PLAN
TOTAL AREA: 7,144 SQ.FT. | 660
SCALE: 1:50
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 the latest edition of ASHRAE Standard 55 (Thermal Environmental Conditions For Human Occupancy) in conjunction with the relevant localised parameters as listed in MS 1525:2007

1 Point:
Provide individual comfort control for ≥ 75% of the building occupants to enable adjustments to suit individual task needs and preferences, AND
Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences.

APPRAOCH & 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.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. Summary report of the strategies that the project will undertake to fulfill the requirements specified in ASHRAE 55 in conjunction with the relevant localised parameters as listed in MS 1525:2014
2. Describe how the project will fulfill the requirements on provision of individual control for at least 50% of building occupants and also provision of controls for shared multi-occupant spaces.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
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 72-hour record (during full occupancy) of temperature measurement for at least two (2) areas acceptable to the GBI Certifier, to verify the specified close thermal comfort condition.
3. Summary report on the individual types of control and the controls for multi-occupant spaces that are provided to achieve the credit compliance.
4. Photographic evidence of each typical type of sensor and control installed.
5. Describe any deviations or additions to the DA submission.
**THERMAL COMFORT, DESIGN & CONTROLLABILITY OF SYSTEMS (CONTINUED)**

**EXAMPLE**

1. **Credit Compliance**

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a high level of thermal comfort system control by individual occupants or by a specific groups in multi occupants’ spaces to promote the productivity, comfort and wellbeing of building occupants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design to the latest edition of ASHRAE Standard 55 (Thermal Environmental Conditions for Human Occupancy) in conjunction with the relevant localised parameters as listed in MS1525. (1 Point)</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Provide individual comfort controls for all interior spaces to enable adjustments to suit group needs and preferences; OR Provide comfort system controls for all shared-multi occupant spaces to enable adjustments to suit group needs and preferences. (1 Point)</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. **Narrative**

A. The base building was designed in accordance with the ASHRAE Standard 55 in conjunction with the following localised parameters as listed in MS1525. The parameters are as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended design dry bulb temperature</td>
<td>23°C - 26°C</td>
</tr>
<tr>
<td>Minimum dry bulb temperature</td>
<td>22 °C</td>
</tr>
<tr>
<td>Recommended design relative humidity</td>
<td>55% - 70%</td>
</tr>
<tr>
<td>Recommended air movement</td>
<td>0.15 m/s – 0.50 m/s</td>
</tr>
<tr>
<td>Maximum air movement</td>
<td>0.7 m/s</td>
</tr>
</tbody>
</table>

B. There are 5 meeting rooms in the office. Each meeting room is equipped with a thermostat to allow occupants to have control or adjust the temperature to suit group needs and preferences. Multi occupant spaces are also equipped with a shared thermostat for control. It shows a selected photograph of thermostat located next to the CO2 sensor located in a multi occupant space. As all thermostats are located next to the CO2, their locations can be located using the CO2 sensor layout shown.
## 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
1 Point: 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

1 Point: To ensure independent control of ventilation rates to maintain CO₂ level < 1,000 ppm at all tenanted indoor spaces. CO₂ sensors should be checked and verified every three years and be able to be re-calibrated.

## 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)

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Submission of ventilation and control schematics together with description of how CO₂ monitoring and controls are integrated into the ventilation design.

### REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. As-Built drawings showing the installed sensors and controls.
2. Summary report on the ventilation design and CO₂ monitoring and control system including information regarding the location, quantity of installed sensors, the operational parameters and setpoints.
3. Manufacturer’s information confirming the specifications and recalibration of the CO₂ sensors.
4. Photographic evidence of typical installations and procedures for re-calibration of CO₂ sensors.
5. Describe any deviations or additions to the DA submission.

---

**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide response monitoring of carbon dioxide levels to ensure delivery of minimum indoor air requirements:</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Facilitate continuous monitoring and adjustment of indoor air ventilation rates at all interior spaces by design, and ensure independent control of ventilation rates to maintain CO2 level ≤ 1,000 ppm (1 Point).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent space monitoring adjustment system of CO2 rates at all interior spaces by design, and to ensure independent control of ventilation rates to maintain CO2 level ≤ 1,000 ppm (1 Point).</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Narrative

There are seven (7) CO2 sensors installed within this office fit-out area as shown. The sensors are connected to a localized BMS system for continuous monitoring and logging of CO2 levels in the office environment. When the CO2 levels exceed 1,000 ppm, a bright red light is visible on the sensor panel. Training has been provided to all employees in the office to perform the following actions when the warning light comes on:

a. Open doors to enclosed spaces such as meeting rooms to dilute/reduce the CO2 levels.

b. Open main doors to elevator lobbies and/or stairwells when CO2 levels in open/general areas exceed the permissible levels.

These CO2 sensors are not linked to the main building ventilation control system and only act as indicators to display the detected CO2 concentrations at the respective locations. As such, the continuous logging of data may be used to establish an understanding of the CO2 levels in this office for a scheduled manual ventilation of the spaces to ensure CO2 levels are maintained below the 1,000 ppm level.

Photo 1: Thermostat located next to the CO2 sensors in meeting rooms and multi-occupant spaces
**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
- Inappropriate maintenance of air conditioning

**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)**
1. Summary report outlining the strategies adopted to meet the credit requirements.
2. A copy of specifications for the strategies to be carried out, including hygiene and maintenance schedule plans during occupancy.

**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)**
1. As-Built drawings or as-Built specifications confirming that the building has been constructed in accordance with the design stage drawings/specifications.
2. Manufacturer’s information on all relevant materials specified for mould prevention and/or resistance, to verify credit compliance. Certification and/or test reports are to be provided as evidence of third party laboratory verifications of material claims against mould prevention.
3. Documentation evidence during construction of the precautions taken for mould prevention, e.g. photographs of material storage and protection for items that are susceptible to mould growth as identified in the DA submission stage.
4. Provide 24-hour record (during full occupancy) of Temperature-Relative Humidity measurements for at least two (2) areas acceptable to the GBI Certifier.
5. Describe any deviations or additions to the DA submission.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design system(s) which reduce the risk of mould growth and its associated detrimental impact on occupant health. Where it is demonstrated that the mechanical air-conditioned ventilation system will maintain a positive indoor air pressure relative to the exterior and can actively control indoor air humidity to be no more than 70% RH without the use of active control that will consume additional energy. (1 Point)</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

Prevent against the growth of mould through the selection of materials that:
1. Naturally prohibit the growth of mould, AND/OR
2. Discourage the growth of mould when applied to; AND Ensure that excessive moisture in the tenant space is controlled during renovations by the consideration and the control of the following (1 Point):
   i. Rainwater leakage through façade and walls,
   ii. Infiltration of moist air,
   iii. Diffusion of moisture through façade and walls,
   iv. Leaking or burst pipes,
   v. Indoor moisture sources,
   OR
   vi. The tenant space is fully naturally ventilated.

   Prevnt against the growth of mould through the selection of materials that: 1. Naturally prohibit the growth of mould, AND/OR 2. Discourage the growth of mould when applied to; AND Ensure that excessive moisture in the tenant space is controlled during renovations by the consideration and the control of the following (1 Point):
   i. Rainwater leakage through façade and walls,
   ii. Infiltration of moist air,
   iii. Diffusion of moisture through façade and walls,
   iv. Leaking or burst pipes,
   v. Indoor moisture sources,
   OR
   vi. The tenant space is fully naturally ventilated.

   Prevent against the growth of mould through the selection of materials that: 1. Naturally prohibit the growth of mould, AND/OR 2. Discourage the growth of mould when applied to; AND Ensure that excessive moisture in the tenant space is controlled during renovations by the consideration and the control of the following (1 Point):
   i. Rainwater leakage through façade and walls,
   ii. Infiltration of moist air,
   iii. Diffusion of moisture through façade and walls,
   iv. Leaking or burst pipes,
   v. Indoor moisture sources,
   OR
   vi. The tenant space is fully naturally ventilated.

2. Narrative

A. The design of air-conditioning system for the base building is based on MS1525 where the relative humidity (RH) at office zones is designed not to exceed 70%. Please refer to the attached extract from base building MEP Design Brief. RH measurement was conducted in the office and the result is attached.

B. During the construction phase, the tenant space was fully ventilated and in addition to that, an exhaust fan was installed to draw out air to improve ventilation as well as reduce indoor moisture levels. There were minimal wet trades involved in the fit out of the office.

Photo 1: Exhaust fan use to ventilate the site during construction

Photo 2: Minimal dry trade involved during construction
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ5 MOULD PREVENTION (CONTINUED) 2 POINTS

EXAMPLE

![Graph showing RH (%) and TEMP (°C) from 11 Nov - 19 Nov 2013]
**INTERIORS**

**INDOOR ENVIRONMENTAL QUALITY (EQ)**

<table>
<thead>
<tr>
<th>EQ6</th>
<th>DAYLIGHTING</th>
<th>1 POINT</th>
</tr>
</thead>
</table>

**INTENT**
To encourage use of diffused daylighting into interior of building.

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

**REQUIREMENTS**

1 Point: Demonstrate that ≥ 50% of the NLA has a Daylight Factor in the range of 1.0 – 3.5% as measured at the working plane, 800mm from floor level.

Note: Refer to MS1525:2014 for the description and calculation of Daylight Factor.

**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 daylit space, to ensure visual comfort, the lighting level should be fairly uniform with no great contrast.

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

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

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

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.

---

**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide good levels of daylighting for building occupants:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate that ≥ 50% of the interior spaces has a daylight factor in the range of 1.0-3.5% as measured at the working plane, 800mm from floor level (1 Point).</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Narrative

A. Daylight mapping has been carried out and the summarised report is attached. The daylight mapping result shows that less than 50% of the interior space area has a daylight factor of more than 0.5%. The intention of the office design was to minimise the use of artificial light and maximise use of natural lighting. The employees are comfortable with the lighting levels in the office and they have control over the light switches to control the lightings in their work areas. On a cloudy day, the lux level measured was approximately 200 lux and it was conducive to work without the use of artificial lighting.
INTENT
To reduce discomfort of glare from natural light.

DESCRIPTION
Ensure daylighting system is designed with adequate and proper glare control in order not to negate the benefits of daylighting.

REQUIREMENTS
1 Point: Reduce discomfort of glare from natural light. Where blinds or screens are fitted on 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 luminance level below 2000 lux;
2. Eliminate glare from diffused 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).

APPROACH & IMPLEMENTATION
Glare issues typically arise during periods of low angle sun (early morning and late afternoons) and during periods with bright sky. Glare control should therefore be designed to ensure both a view out and some level of daylight when the systems are engaged.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. Typical floor plans and sections showing variable position of glare control system.
2. Brief description of proposed control mechanism to be provided.
3. Summary report to describe how view and daylight is assured when glare control system is engaged.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. As-Built drawings and specifications to confirm that building is constructed according to design drawing and specifications.
2. Typical As-Built floor plans and sections showing position of glare control system.
3. Description of control mechanism installed.
4. Manufacturer’s Information on the blind and control systems provided.
5. Summary report to describe how view and daylight is assured when glare control system is engaged.
6. Furnish photographs of each type of typical glared control system installed.
7. Describe any deviations or additions to the DA submission.
EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 Point): 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 sunlight only – not applicable for fixed blinds/screens); AND 4. Equip with a manual override function accessible by occupants (not applicable for fixed blinds/screens)</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Narrative

The work desks are placed approximately 2.0m from the windows to reduce glare. Window blinds are also fixed on windows at the East and the West side of the office where there is incident direct sunlight for occupant comfort. The opaque blinds have the ability to reduce the incident sunlight without blocking out the light excessively, thus still permitting sufficient daylight through. Employees also regularly raise and lower the blinds to suit the conditions.
INTENT
To ensure office lighting level is not over-designed.

DESCRIPTION
Ensure office lighting level is designed in accordance to MS1525:2014 for different types of spaces.

REQUIREMENTS
1 Point: Demonstrate that office lighting design maintains a luminance level of no more than specified in MS1525:2014 for 90% of interior spaces as measured at the working plane (800 mm above the floor level) or other acceptable guidelines.

APPROACH & IMPLEMENTATION
The ambient lighting level should be designed in accordance with the illuminance level recommended in MS1525:2014. 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)
1. Summary report of lighting design brief to illustrate how the credit will be met.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
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.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline building office lighting not to be over designed: Demonstrate that office lighting design maintains a luminance level of no more than specified in MS1525 for 90% of interior spaces as measured at the working plane (800mm above the floor level) or other acceptable lighting guidelines.</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Narrative

The base building office luminance report is attached. Lighting at locations where the lux levels were more than 500 have been replaced with energy efficient LED fixtures with lower illuminance. The lux levels measured at night in office were found to be below 500. The exact locations and levels are attached.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ8  ELECTRICAL LIGHTING LEVELS (CONTINUED)  1 POINT

EXAMPLE

MEASURED LUX LEVELS AT 9PM ON 9th OCTOBER 2014
**INTERIORS**  
**INDOOR ENVIRONMENTAL QUALITY (EQ)**

<table>
<thead>
<tr>
<th>EQ9</th>
<th>HIGH FREQUENCY BALLASTS</th>
<th>1 POINT</th>
</tr>
</thead>
</table>

**INTENT**  
To provide a comfortable visual working environment for occupants.

**DESCRIPTION**  
Increase workplace amenity by avoiding low frequency flickers that may be associated with fluorescent light fittings.

**REQUIREMENTS**  
1 Point: Install high frequency ballasts in fluorescent luminaires for 100% of interior spaces.

**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)**

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>OBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Description of design strategy to achieve installation of high frequency ballasts for minimum 90% of NLA.</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>OBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. As-Built lighting plans to identify 100% of interior spaces has fluorescent luminaries installed with high frequency ballasts.</td>
<td></td>
</tr>
<tr>
<td>2. Manufacturer’s information confirming the specifications of high frequency ballasts installed.</td>
<td></td>
</tr>
<tr>
<td>3. Describe any deviations or additions to the DA submission.</td>
<td></td>
</tr>
</tbody>
</table>
EXEMPLARY CREDIT:

1. **Credit Compliance**

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase workplace amenity by avoiding low frequency flicker that may be associated with fluorescent lighting: Install high frequency ballasts in fluorescent luminaires for 100% of interior spaces.</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

2. **Narrative**

All fluorescent light fittings within the Office use electronic ballasts as shown below. The operating frequency of the ballast is 50 Hz. The high frequency ballasts help prevent fluorescent lights from flickering resulting in better visual comfort and eye strain to the occupants.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ10  EXTERNAL VIEW  1 POINT

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 ≥ 75% of all working spaces 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)

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)

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. Describe any deviations or additions to the DA submission.  ○ ○
EXAMPLE

1. Credit Compliance

<table>
<thead>
<tr>
<th>Credit Requirements</th>
<th>Project Complies</th>
<th>Applied Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce eyestrain for building occupants by allowing long distance views and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>provision of visual connection to the outdoor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase view for building occupants by allowing long view and provision of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>visual connection to the indoor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate that ≥ 75% of all working space has a direct line of sight through</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>vision indoor and outdoor glazing at a height of 1.2m from floor level.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Narrative

We have adopted an open office concept with the intention to inspire creativity and encourage collaboration amongst our staff. The open plan areas are located in the East and West Wings of the office floor area while the majority of the meeting and conference rooms are located along the perimeter of the West Wing. All employees have a direct line of sight to the outdoors as indicated on the layout. The walls of the rooms are also made of glass allowing unobstructed views to the outside.
INTERIORS
INDOOR ENVIRONMENTAL QUALITY (EQ)

EQ11 INTERNAL NOISE LEVEL 1 POINT

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
1 Point: Demonstrate all working spaces do not exceed the following ambient internal noise level:
- Within the entire building general office, space noise does not exceed 40dBAeq OR
- Within the baseline building office space, the sound level does not exceed 45dBAeq for open plan and does 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)
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)
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.
### DASHBOARD

MENARA BINJAI
Noise Level Measurement
Level 31 LLM Office

<table>
<thead>
<tr>
<th>Point</th>
<th>Leq</th>
<th>L90</th>
<th>L10</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>48.3</td>
<td>46.5</td>
<td>48.8</td>
<td>Open Office</td>
</tr>
<tr>
<td>34</td>
<td>40.7</td>
<td>39.4</td>
<td>41.7</td>
<td>Open Office</td>
</tr>
<tr>
<td>35</td>
<td>42.8</td>
<td>41.0</td>
<td>45.0</td>
<td>Open Office</td>
</tr>
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<td>36</td>
<td>39.5</td>
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<tr>
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<td>34.6</td>
<td>Discussion Room</td>
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<td>39.4</td>
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<td>Open Office</td>
</tr>
<tr>
<td>39</td>
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<td>45.2</td>
<td>42.1</td>
<td>Open Office</td>
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<td>42</td>
<td>42.2</td>
<td>46.2</td>
<td>40.2</td>
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<td>43</td>
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<td>45</td>
<td>47.5</td>
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</tr>
<tr>
<td>46</td>
<td>47.2</td>
<td>51.2</td>
<td>45.6</td>
<td>Open Office</td>
</tr>
<tr>
<td>47</td>
<td>47.2</td>
<td>48.2</td>
<td>46.1</td>
<td>Open Office</td>
</tr>
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<td>48</td>
<td>46.6</td>
<td>47.4</td>
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<td>Open Office</td>
</tr>
<tr>
<td>49</td>
<td>39.7</td>
<td>40.0</td>
<td>37.8</td>
<td>Meeting Room</td>
</tr>
</tbody>
</table>

Max  48.3  51.2  48.8
Min  36.0  37.7  34.6
Ave  43.5  45.1  42.5

Average
- Open Office  44.4  45.6  43.6
- Private Office  39.5  42.4  37.2
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 as follows:

1. Perform a building flush-out by supplying outdoor air to provide not less than 10 air changes/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

2. If low VOC materials and low formaldehyde composite wood are used (EQ4 is achieved), then building flush-out can be performed by supplying outdoor air to provide not less than 10 ACH for at least 15 minutes operation or not less than 6 ACH for at least 30 minutes operation and continuous 1ACH during the initial 7 days occupancy of the completed building, OR

3. Within 6 months of occupancy, conduct IAQ testing to demonstrate maximum concentrations for pollutants are not exceeded according to the Indoor Air Quality Code of Malaysia, AND

4. During Occupancy Phase: An IAQ audit will be carried out to determine if present IAQ is conducive or detrimental to occupants.

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)

1. Summary report outlining the strategies and procedures to be taken to meet the credit requirements.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

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.
### IAQ BEFORE & DURING OCCUPANCY (CONTINUED)

**EQ12**

**1 POINT**

#### EXAMPLE

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>TVOC ppb</th>
<th>Carbon Dioxide ppm</th>
<th>Carbon Monoxide ppm</th>
<th>Temperature °C</th>
<th>Relative Humidity %</th>
<th>Formaldehyde HCHO ppm</th>
<th>PM 10 mg /m³</th>
<th>Ozone O3 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOSH 2010 Acceptable Limits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>C1000</td>
<td>10</td>
<td>23 - 26</td>
<td>40 - 70</td>
<td>0.1</td>
<td>0.15</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Average 28/03/2014</td>
<td>1602.2</td>
<td>800.1</td>
<td>0.02</td>
<td>24.29</td>
<td>59.56</td>
<td>0.085</td>
<td>0.01695</td>
<td>N / A</td>
</tr>
</tbody>
</table>

**POST OCCUPANCY**

Logged Data

- **28/03/2014 11:43**: 1542 817 0.4 25.5 55.9
  - Started at: 28-Mar-14 11:43:24 AM
- **28/03/2014 11:44**: 1547 799 0.2 25.3 55.9
  - Ended at: 28-Mar-14 12:12:24 PM
- **28/03/2014 11:45**: 1553 796 0.1 25.1 56.3
  - Duration: 00:29:00 h:m:s
- **28/03/2014 11:46**: 1565 797 0 25 56.8
  - Number of rows = 30
- **28/03/2014 11:47**: 1567 801 0 24.7 57.2
  - TVOC ppb: Min = 1542 at 28-Mar-14 11:43:24 AM
  - Max = 1634 at 28-Mar-14 11:55:24 AM
  - Average = 1602.2
- **28/03/2014 11:48**: 1580 796 0 24.5 57.6
  - Carbon Dioxide ppm:
  - Min = 787 at 28-Mar-14 12:11:24 PM
  - Max = 817 at 28-Mar-14 11:43:24 AM
  - Average = 800.1
- **28/03/2014 11:49**: 1598 802 0 24.6 58.2
  - Carbon Monoxide ppm:
  - Min = 0.0 at 28-Mar-14 12:12:24 PM
  - Max = 0.4 at 28-Mar-14 11:43:24 AM
  - Average = 0.02
- **28/03/2014 11:50**: 1603 804 0 24.3 58.5
- **28/03/2014 11:51**: 1614 808 0 24.3 59  - Temperature °C:
  - Min = 23.8 at 28-Mar-14 12:08:24 PM
  - Max = 25.5 at 28-Mar-14 11:43:24 AM
  - Average = 24.29
- **28/03/2014 11:52**: 1626 807 0 24.3 59.2
- **28/03/2014 11:53**: 1626 807 0 24.1 59.4
- **28/03/2014 11:54**: 1632 810 0 24.2 59.7
- **28/03/2014 11:55**: 1634 810 0 24 60
  - Relative Humidity %RH:
  - Min = 55.9 at 28-Mar-14 11:44:24 AM
  - Max = 61.4 at 28-Mar-14 12:12:24 PM
  - Average = 59.56
- **28/03/2014 11:56**: 1633 806 0 24.2 60.1
- **28/03/2014 11:57**: 1631 807 0 24.3 60
- **28/03/2014 11:58**: 1624 805 0 24.2 60
- **28/03/2014 11:59**: 1614 803 0 24.2 60.1
- **28/03/2014 12:00**: 1606 806 0 23.9 60.2
- **28/03/2014 12:01**: 1608 800 0 23.9 60.4
- **28/03/2014 12:02**: 1616 800 0 24 60.6
- **28/03/2014 12:03**: 1615 795 0 23.9 60.9
- **28/03/2014 12:04**: 1617 792 0 24.1 61.1
- **28/03/2014 12:05**: 1610 793 0 24 61.1
- **28/03/2014 12:06**: 1608 792 0 23.9 61.1
- **28/03/2014 12:07**: 1605 789 0 23.9 61.1
- **28/03/2014 12:08**: 1604 790 0 23.8 61.2
- **28/03/2014 12:09**: 1604 791 0 23.9 61.2
- **28/03/2014 12:10**: 1601 790 0 24.1 61.3
- **28/03/2014 12:11**: 1595 787 0 24.2 61.3
- **28/03/2014 12:12**: 1589 803 0 24.2 61.4
**INTERIORS**

**INDOOR ENVIRONMENTAL QUALITY (EQ)**

### EQ12  IAQ BEFORE & DURING OCCUPANCY (CONTINUED) 1 POINT

**EXAMPLE**

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>TVOC ppb</th>
<th>Carbon Dioxide ppm</th>
<th>Carbon Monoxide ppm</th>
<th>Temperature db °C</th>
<th>Relative Humidity %</th>
<th>Formaldehyde HCHO ppm</th>
<th>PM 10 mg/m³</th>
<th>Ozone ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOSH 2010 Acceptable Limits</td>
<td>3000</td>
<td>C1000</td>
<td>10</td>
<td>23 - 26</td>
<td>40 - 70</td>
<td>0.1</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td>Average 3/04/2014</td>
<td>1561.62</td>
<td>881.92</td>
<td>0</td>
<td>23.46</td>
<td>61.34</td>
<td>0.1</td>
<td>0.0086</td>
<td>N / A</td>
</tr>
</tbody>
</table>

Logged Data

3/04/2014 16:01  1788 902 0 23.9 61.3  Started at: 03-Apr-14 04:01:21 PM
3/04/2014 16:02  1753 877 0 24 61.2  Ended at: 03-Apr-14 04:26:21 PM
3/04/2014 16:03  1724 867 0 23.9 61  Duration: 00:25:59 h:m:s
3/04/2014 16:04  1695 870 0 23.9 61  Number of rows = 26
3/04/2014 16:05  1661 873 0 23.8 61  TVOC ppb:
3/04/2014 16:06  1639 866 0 23.7 61  Min = 1402 at 03-Apr-14 04:26:21 PM
3/04/2014 16:07  1628 872 0 23.7 61.2  Max = 1788 at 03-Apr-14 04:01:21 PM
3/04/2014 16:08  1612 874 0 23.6 61.3  Average = 1561.62
3/04/2014 16:09  1596 871 0 23.6 61.4 Carbon Dioxide ppm:
3/04/2014 16:10  1580 885 0 23.4 61.4  Min = 866 at 03-Apr-14 04:06:21 PM
3/04/2014 16:11  1571 874 0 23.4 61.5  Max = 914 at 03-Apr-14 04:26:21 PM
3/04/2014 16:12  1566 879 0 23.3 61.6  Average = 881.92
3/04/2014 16:13  1563 877 0 23.4 61.7 Carbon Monoxide ppm:
3/04/2014 16:14  1552 882 0 23.3 61.9  Min = 0.0 at 03-Apr-14 04:26:21 PM
3/04/2014 16:15  1540 880 0 23.3 61.8  Max = 0.0 at 03-Apr-14 04:26:21 PM
3/04/2014 16:16  1530 886 0 23.3 61.8  Average = 0.00
3/04/2014 16:17  1526 880 0 23.4 61.8  Temperature °C:
3/04/2014 16:18  1509 880 0 23.2 61.6  Min = 23.2 at 03-Apr-14 04:18:21 PM
3/04/2014 16:19  1501 890 0 23.2 61.5  Max = 24.0 at 03-Apr-14 04:02:21 PM
3/04/2014 16:20  1484 888 0 23.2 61.3  Average = 23.46
3/04/2014 16:21  1470 891 0 23.2 61.2 Relative Humidity %RH:
3/04/2014 16:22  1456 885 0 23.3 61.2  Min = 61.0 at 03-Apr-14 03:00:21 PM
3/04/2014 16:23  1434 890 0 23.3 61.1  Max = 61.9 at 03-Apr-14 04:14:21 PM
3/04/2014 16:24  1416 888 0 23.3 61  Average = 61.34
3/04/2014 16:25  1406 889 0 23.2 61
3/04/2014 16:26  1402 914 0 23.2 61.1
**GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT**

**INTERIORS**

**INDOOR ENVIRONMENTAL QUALITY (EQ)**

<table>
<thead>
<tr>
<th>EQ13</th>
<th>POST OCCUPANCY COMFORT SURVEY: VERIFICATION</th>
<th>1 POINT</th>
</tr>
</thead>
</table>

**INTENT**
To provide verification for 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**

1 Point: Conduct a post-occupancy comfort survey of building occupants within 3 to 6 months after occupancy. This survey should collect anonymous responses about thermal comfort, visual comfort and acoustic comfort in interior spaces. 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 tenanted spaces. 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)**

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

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>OBJ</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

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

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.

<table>
<thead>
<tr>
<th>SUBMITTER</th>
<th>OBJ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)
INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM1 BUILDING SELECTION 1 POINT

INTENT
Encourage the selection of a sustainable base building that is awarded with a GBI certificate.

DESCRIPTION
Base building refers to the existing shell condition of a building prior to the installation of tenant improvements. The base building of a structure consists of the fundamental elements that are structurally necessary for the building and does not usually change.

Green Building Index (GBI) certification requires the whole base building to be properly designed and sustainably maintained to remain green.

REQUIREMENTS
1 Point: Awarded for the selection of a GBI-certified building.

Base building shall be certified under one of the following GBI Assessment criteria:

- NRNC - Non-Residential New Construction
- NREB - Non-Residential Existing Building
- RNC - Residential New Construction
- IEB - Industrial Existing Building
- INC - Industrial New Construction

Lapse in renewal, failure to achieve, or, for whatever reason, unable to maintain the validity of base building GBI certified status, would render disqualification or revocation of point under this category.

APPROACH & IMPLEMENTATION
Validation of GBI certification status of the base building intended for assessment.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Valid GBI certificate of the base building.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. Valid GBI certificate of the base building
2. Describe any deviation or addition to the DA submission.

SUBMITTER GBI
SUBMITTER GBI

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM2 REFURBISHMENT OF EXISTING OR ABANDONED INTERIOR SPACE 1 POINT

INTENT
Encourage retrofitting existing or abandoned interior space.

DESCRIPTION
Building reuse is an effective means of achieving both economic and sustainability goals. The refurbishment of an existing or abandoned interior space is to minimize the abandonment of older buildings, thus minimizing the need for extensive demolition and rebuilding of new buildings which will cause unnecessary demands on resources. Refurbishment of an existing or abandoned interior space is also an effective method to re-establish the value of the existing building.

REQUIREMENTS
1 Point: Refurbishment of existing interior spaces that maintain >25% (based on cost/volume/area) of the existing fit-out and/or finishes.

APPROACH & IMPLEMENTATION
• Identification of the existing building interiors that can be maintained. For existing buildings that have a GBI Certification, priority shall be given to the maintenance of the structures and facilities of the original structure.
• For spaces with existing interior fit-out, prior to the current refurbishment, the original interior fit-out is to be compared with the alteration done. There may be additional fit-out or fittings, which may required removal to reinstate the original structure of the interiors. Consideration is required on whether the additional fit-out or fittings are contributory to sustainability or a hindrance. In the case where any original fit-out or fittings have been removed, consideration is required on the reinstallation or alternative improvements which shall be included in the refurbishment exercise to ensure a sustainable outcome.
• Design of areas with identification of improvements to existing structures to maintain at least 25% of the original interiors space (based on cost) of the existing fit-out and/or finishes.
• Justify the necessity to improve on the existing interior spaces based the various applicable GBI Interiors Tool credits.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Interior Design layout with legends and clear indications of areas with new/additional fit-out.
2. Justification of the necessity of improvements to the existing interior spaces based on the various applicable GBI Interiors Tool points.
3. List of proposed materials to be used in the refurbishment exercise as a result of the modifications to the existing fit-out and/or fittings.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. As-built drawings with clear indication of refurbished areas which shall match the interior design layout.
2. Receipts for verification of costs related to the refurbishment of existing fit-out and/or finishes.
3. Describe any deviations or addition to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE

SUBMITTING PROFESSIONAL

PROJECT NAME

DATE

NAME DESIGNATION COMPANY SIGNATURE

CLIENT

NAME DESIGNATION COMPANY SIGNATURE
INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM3 PUBLIC TRANSPORTATION ACCESS 1 POINT

INTENT
Encourage the reduction of heavy dependence on private transport, which is a big contributor of Green House Gases (GHG) in cities.

DESCRIPTION
Community-based strategies need to be explored and implemented to encourage responsible land use and transit-oriented development designed to increase public transit ridership. An interior space of a building located within easy access to public transportation stops/hubs will encourage the reduction of private vehicles in cities, especially if the public transportation facilities are adequate and interconnected, allowing an easy access from surrounding residential areas to commercial or work destinations.

REQUIREMENTS
Interior spaces of buildings located within 500m from a Public Transport Stop.
OR
Interior spaces of buildings located within 1km from a Public Transport Interchange.

APPROACH & IMPLEMENTATION
Identification of available and active public transportation stop(s) or interchange(s)

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Site plan(s) marked up with a circle of 500m/1km in radius with the building in its center complete with an indication of all available public transportation stops or interchanges.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. Site plan(s) marked up with a circle of 500m/1km in radius with the building in its center complete with an indication of all available public transportation stops or interchange.
2. Describe any deviation or addition to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
COMMUNITY CONNECTIVITY

INTENT
Encourage the selection of a building close to basic community amenities.

DESCRIPTION
The building is located in an area where people can walk to services they use, with basic services located within 1km of the building for easy access and eliminate the use of public transportation whenever possible.

REQUIREMENTS
1 Point: Awarded for any 10 of the Basic Services listed below that are within 1km AND with availability of pedestrian access between the building and the services;

1) Bank / Electronic Banking Centre
2) Place of Worship
3) Convenience Store / Grocery / Supermarket
4) Day Care
5) Police Station
6) Fire Station
7) Beauty Salon
8) Hardware Shop
9) Laundry
10) Library
11) Medical / Dental
12) Senior Care Facility
13) Park / Recreational Facilities
14) Pharmacy
15) Post Office
16) Restaurant
17) School
18) Theatre
19) Community Centre
20) Fitness Centre

APPROACH & IMPLEMENTATION
Identification of available basic services within 1km radius of the building.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. Site plan showing a minimum radius of 1km of the building location with indication of all available basic services and an accompanying list of these basic services.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. Site plan showing a minimum radius of 1km of the building location with indication of all available and active basic services, and an accompanying list of these basic services for validation of references. This should be similar to the one submitted during DA.
2. Describe any deviation or addition to the DA submission.
**INTENT**

Encourage the practice of sustainable interior space design.

**DESCRIPTION**

Sustainable interior space design eliminates negative environmental impact through skillful, sensitive design, which takes into consideration the well-being of its tenants in the long run.

**REQUIREMENTS**

1 Point: Awarded for each sustainable space design listed below, up to a maximum of 10 Points. Project team may submit any new items not listed below to GBI for consideration and approval.

1. Provision of an open plan layout ≥ 50% OR other equivalent space(s).
2. Provision of flexible plan layout ≥ 25% OR other equivalent space(s).
3. Provision of wireless connectivity.
4. Use of demountable partition OR any other equivalent pre-fabricated system(s).
5. Provision of a dedicated enclosed space with exhaust to accommodate photocopy machines and/or plotters to contain the O3 emissions OR any other equivalent space(s).
6. Provision of a dedicated Recreation OR Break-out OR any other equivalent space(s) to cater to occupant needs.
7. Provision of Nursing Room OR Child Care Space OR Sick Bay with First-Aid Facilities OR any other equivalent space(s).
8. Provision of a Surau/place of worship OR other equivalent space(s).
9. Adoption of Universal Access Design(s).
10. Hot desking 30% of work stations.
11. Provision of a fully equipped pantry to cater to occupant needs.

**APPROACH & IMPLEMENTATION**

- Identify the needs of tenants, giving considerations of the available space to maximize allocations of space catering to the well-being of tenants.
- Consider the ease and ergonomics of the sustainable space designs to ensure that the space allocated will not hinder the daily activities of the tenants, and to ensure that the sustainable space designed will be used as part of the available daily facilities to the tenants.

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

1. Interior design layout. To include the systems layout for demountable partition or any other equivalent systems.
2. Exhaust mechanism design & product specification, if applicable, for all areas especially if there is a provision of dedicated photocopier or plotter room.
3. Wireless connectivity specifications and identification of signal areas if necessary. (Eg. there is no need for connections in nursing rooms, surau or sick bay areas)
4. Designing operations system layout & design supporting documents.

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

1. Describe any deviation or addition to the DA submission.
2. As-built layout plan drawings.
4. Warranty or undertaking by contractor of partition system.
5. For provisions of nursing room or sick bay area, documentations of ready facilities and equipment suitable for use, such as availability of first aid kit with necessary posters / manuals for proper use of medical equipment, sinks and available communication device in the room(s).

**NOTE** Attach all submittals with this cover page.
# GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

## INTERIORS

### SUSTAINABLE PLANNING & MANAGEMENT (SM)

### SM6 INDOOR GREENSCAPE & INDOOR WATER FEATURE  2 POINTS

### INTENT

Encourage the provision of indoor greenscape within the interior space design.

### DESCRIPTION

Indoor greenscapes create additional dimensions to interior spaces and are capable of defining areas within a floor plan. Interior greenscapes contribute to cleaner indoor air as well as act as a natural respite, enhancing the physical and mental health and wellbeing of its tenants.

### REQUIREMENTS

Points are awarded according to the percentage of the indoor greenscape (inclusive of wall area) comparative to total Interior Floor Space/Area.

- **1 Point:** Provide indoor greenscape with native/adaptive plants to ≥ 1% of the total Interior Floor Space.
- **OR**
- **2 Points:** Provide indoor greenscape with native/adaptive plants to ≥ 3% of the total Interior Floor Space.

### APPROACH & IMPLEMENTATION

- Native/adaptive plants suitable for indoor use that complements the interior fit-out shall be selected over sensitive and exotic variants.

### REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

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<tbody>
<tr>
<td>1. Indoor greenscape strategy narrative</td>
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<tr>
<td>2. Interior layout drawing clearly indicating/showing greenscape and/or water features.</td>
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<tr>
<td>3. A list of proposed plants and a description of the watering system and maintenance proposal.</td>
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### REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

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<tr>
<td>4. Describe any deviation or addition to the DA submission.</td>
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</table>
  - The most appropriate irrigation system or watering strategy for the maintenance of the indoor plants need to be determined and implemented
  - Use of edible/herbal plants in the indoor green landscape strategy is encouraged.

### SUBMITTING PROFESSIONAL

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**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTENT
Adopt and implement Sustainable Construction strategies during the fit-out period.

DESCRIPTION
Sustainable construction aims at reducing the environmental impact of a building over its entire lifetime, while optimizing its economic viability and the comfort and safety of its tenants. This includes the practice of sustainability even during the construction process.

REQUIREMENTS
1 Point: Awarded for compliance with any of the items listed below:
1) Reduce potable water consumption by reducing wet trades
2) Reduce energy use by harnessing daylight,
3) Reduce energy use through energy efficient equipment and/or appliances.

APPROACH & IMPLEMENTATION
• Consider the use of materials and systems that will allow preparation of indoor systems that can be installed with minimal time and material waste on site. Materials and systems should take into consideration the necessity for wet or dry trades.
• Scheduling of interior space installations and renovations to allow daytime implementation as opposed to night time installation to maximize harnessing of daylight on site.
• Careful planning and consideration of equipment for installation and renovation of the interior spaces using electrical / mechanical equipment and/or appliances.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. Description of materials and systems and whether wet or dry trade was avoided on site.
2. Daily working hours during the fit-out period.
3. A complete and comprehensive list of all electrical equipment used along with the energy ratings.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. Description of materials and systems and whether wet or dry trade was avoided on site.
2. Daily working hours during the fit-out period.
3. A complete and comprehensive list of all electrical equipment used along with the energy ratings.
4. Electricity usage readings from power meters during fit-out.
5. Usage readings from water meters during fit-out.
6. Describe any deviation or addition to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
# CONSTRUCTION POLLUTION CONTROL POLICY

## INTENT
Implement policy/strategies for construction pollution control during the fit-out phase.

## DESCRIPTION
Construction site practices will determine the control and prevention of pollution. Specific measures can be taken to mitigate risks of dust spreading, selection of non-toxic paints, solvents and other hazardous materials whenever possible, reduction of noise pollution through careful handling of materials, use of modern and quiet, low vibration power tools and generations, low impact technologies and wall structures as sound shields.

## REQUIREMENTS
1 Point: For compliance of all below:
1) Implement policy/strategies to reduce construction related dust, noise, water, air pollutant and vibration

## APPROACH & IMPLEMENTATION
- Conduct pre-construction survey and studies to create a policy/strategy for pollution control to be employed during construction / renovation / installation.
- Include relevant claused/condition in the tender documents for compliance by contractors.
- Carry out an induction of the construction workers on the policy/ strategy.

### REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
- Copy of policy/strategy for construction pollution control during construction / renovation / installation.

### REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. A construction pollutant control report
2. Acknowledgement by immediate neighbours supporting the successful implementation of construction pollution control strategies during the fit-out process.
3. Describe any deviation or addition to the DA submission.

---

**NOTE**
ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM9 STORAGE & COLLECTION OF RECYCLABLES 1 POINT

INTENT
Encourage the reduction of waste generated during construction and during building occupancy that is hauled and disposed of in landfills.

DESCRIPTION
The practice of collecting recyclables helps divert waste from landfills and encourages responsible reuse/recycling of resources.

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

REQUIREMENTS
1 Point: Awarded for compliance of the following:

1) During Construction, provide dedicated area/s and storage for collection of non-hazardous materials for recycling, AND
2) During Building Occupancy, provide permanent recycle bins for both non-hazardous and waste material.

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)

1. Identify the permanent recycling storage areas within the interior design of the project space. Demonstrate that the recycling storage areas are appropriately sized and located. Floor plans showing the proposed locations of the storage areas for recyclables and vehicular access point/s.

2. Ensure that the space provided for recyclables is in addition to the storage space allocated for general waste.

3. Include policy/strategy to reduce waste, e.g. policy of reusing single-side printed papers for printing etc. with description of dedicated area to keep the recyclable papers.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

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.

SUBMITTING PROFESSIONAL

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE

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GREENBUILDINGINDEX SDN BHD (845666-V)
INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM10 CONSTRUCTION WASTE MANAGEMENT 1 POINT

INTENT
Develop and implement a construction waste management plan 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
1 Point: Recycle and/or salvage ≥ 75% 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)
1. Waste Management Plan with projected non-hazardous construction debris that may be salvaged from the total volume.
2. Tabulate the anticipated diverted/recycled/landfill waste and the estimated quantity of the diverted/recycled/landfill waste.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. Waste Management plan, together with the tonnage of non-hazardous construction debris with percentage against the total volume.
2. Describe any deviations or additions to the DA submission.
**INTERIORS**

**SUSTAINABLE PLANNING & MANAGEMENT (SM)**

**SM11 SITE SAFETY 1 POINT**

**INTENT**

Implement a Site Amenities Plan and Safety and Health strategies for all construction workers.

**DESCRIPTION**

It was reported that the fatal injury rate for the construction industry is higher than the national average in this category for all industries. To prevent the potential hazards to construction workers, OSHA regulations are required in the construction industry, and shall be for implemented during construction / renovations / installations activities.

**REQUIREMENTS**

1 Point:
1. Implement a Site Amenities Plan; e.g. accommodation, toilet facilities and any other Site Amenities deemed applicable for construction works, **AND**
2. Implement strategies to meet the requirements of the Occupational Safety and Health Act 1994 (Act 514).

**APPROACH & IMPLEMENTATION**

- Define guidelines and policies for safety and health measures to be applied to the site during construction.
- Use of appropriate (Personal Protective Equipment (PPE) on site
- A safety officer has to be available to inspect and approve site equipment and to ensure the safety of workers on site during construction.
- First aid kits shall be made available during construction on site in case of emergencies. Emergency contact numbers to hospitals, fire department or legal enforcement offices are to be listed, along with ready on-site communication devices, such as telephones.
- Fire extinguisher in working order shall be on site.
- Examination of all electrical sockets and wiring to ensure that all items are in excellent working condition.

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

1. A copy of the Site Safety and Health Policies.
2. List of PPE (such as safety helmets, protective eye wear, safety shoes / boots, gloves, soldering masks, fire extinguishers, etc) used during construction.
3. Preparation of first aid kits for site use.
4. List of emergency contact numbers.

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

1. A copy of the site safety & health policies
2. List of PPE (such as safety helmets, protective eye wear, safety shoes / boots, gloves, soldering masks, fire extinguishers, etc) used during construction.
3. Report(s) of any emergency issues that may have happened during construction which had caused injury to site worker and rectification(s).
4. A report endorsed by a qualified person complete with photographic evidence of PPE, site condition and medical kits, among of items is required.
5. Describe any deviations or additions to the DA submission.

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**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTENT
Commit to and demonstrate best practice in green purchasing and sustainable daily operational solutions that are environmentally responsible and create a culture where sustainability is integrated into daily activities.

DESCRIPTION
Company policy is the guiding principle of the operations of a company; hence a green procurement and operations policy in place is necessary for a long-term sustainability outcome in offices.

REQUIREMENTS
1 Point: Awarded for any 2 of the items listed below, up to a maximum of 2 Points:
1) Procure and/or use multi-functional office equipment and/or appliances for entire office operations.
2) Procure and use environment friendly cleaning products and/or services.
3) Procure and use environment friendly stationery for ≥ 75% of total stationery.
4) Procure and use paper, which consists of ≥50% recycled content.
5) Procure and use paper products, which consist of ≥50% recycle content or alternative fiber products.
6) Paperless office.
7) Any other relevant Green Procurement and Operation initiatives accepted by GBI.

APPROACH & IMPLEMENTATION
• Create and implement a holistic green procurement and operations policy.
• Company handbook on the use of office equipment and consumables.
• Communication strategy through labels or posters at strategic locations.
• Training for all existing and new tenants on the company's green policies.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. Copy of the Company procurement policy.
2. Proposed list of equipment and consumables.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
2. A list of all purchased equipments and consumables for the office.
3. Describe any deviations or additions to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE

SUBMITTER GBI
SUBMITER GBI
INTERIORS
SUSTAINABLE PLANNING & MANAGEMENT (SM)

SM13 SUSTAINABLE MAINTENANCE & GREEN OFFICE GUIDE 2 POINTS

INTENT
Ensure the space will continue to perform as intended.

DESCRIPTION
A documented policy is required to ensure continuous practice to enable sustainability maintenance and culture during occupancy.

REQUIREMENTS
1 Point: Document all features and strategies in a Green Office Guide (GOG) for users information and in guiding them to sustain performance during occupancy.

1) Planned and scheduled educational programme for occupants for both the passive and active green features, AND
2) Trained personnel for monitoring and analyzing all active green features; AND
3) Preventive maintenance plan for at least 3 years.

1 Point: Provide a Green Office Guide which documents both the passive and active green design features.

APPROACH & IMPLEMENTATION
Document all features and strategies a Green Office Guide (GOG) for user's information and in guiding them to sustain performance during occupancy.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

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INTERIORS
MATERIALS & RESOURCES
(MR)
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
MATERIALS & RESOURCES (MR)

MR1 MATERIALS REUSE & SELECTION 2 POINTS

INTENT
To encourage designers to specify the usage of reused building materials in new interior fitouts.

DESCRIPTION
Reuse non-structural building interior materials, components 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 interior design and its buildability with careful selection of building interior products considering its embodied energy and durability of the material in order to lower carbon footprint and improve material’s life cycle.

Mechanical, electrical and plumbing components shall not be included. Only include materials permanently installed in the project.

REQUIREMENTS
1 Point: Where reused building interior materials, components and products (eg. floor, walls, ceilings, furniture, fixtures and furnishings) constitute ≥ 10% of total cost value of interior fitout OR

2 Points: Where reused non-structural building interior materials, components and products (eg. floor, walls, ceilings, furniture, fixtures and furnishings) constitute ≥ 25% of total cost value of interior fitout.

APPROACH & IMPLEMENTATION
Reused Materials found on site: Components such as ceiling tiles, doors, cabinetry, posts, furniture, fixtures and furnishings 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, components and products found off-site. They must be previously used or they may be relocated from another facility.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. List and Cost anticipated reused or salvaged material to be used in the project.
2. Establish the estimated Total Cost Value for the project.
3. Submit by %, estimated Total Cost of reused material against the estimated Total Cost Value of interior fitout.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. As built drawings or as built specifications including photographs confirming that the interiors have been constructed/installed in accordance with the design stage drawings/specifications.
2. List of reused or salvaged materials used in the project after completion and their location in the building.
3. Provide the actual Cost of each reused or salvaged material based either on actual cost paid or replacement value of the material. Determine the actual Total Cost of reused material.
4. Calculate % reused materials = Total Cost of reused or salvaged materials / Total Cost Value of interior fitout x 100%
5. Describe any deviations or additions to the DA submission.

SUBMITTING PROFESSIONAL

PROJECT NAME
DATE

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NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE

VERSION 1.01 | AUGUST 2019 79
### INTERIORS
#### MATERIALS & RESOURCES (MR)

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<th>MR2</th>
<th>RECYCLED CONTENT MATERIALS</th>
<th>4 POINTS</th>
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**INTENT**
To encourage designers to specify the use of recycled content materials and products in new interior fitouts.

**DESCRIPTION**
Increase demand for building interior materials, components, products, furniture, fixtures and furnishings that incorporate recycled content materials in their production. (Recycled content shall be defined in accordance with the ISO 14021 document).

Mechanical, electrical and plumbing components shall not be included. Only include materials permanently installed in the project.

**REQUIREMENTS**
1 Point: Where use of floor materials, components and products with recycled content is such that the sum of post-consumer and pre-consumer recycled content value constitute ≥ 30% of total cost value of interior fitout
1 Point: Where use of wall materials, components and products with recycled content is such that the sum of post-consumer and pre-consumer recycled content value constitute ≥ 30% of total cost value of interior fitout
1 Point: Where use of ceiling materials, components and products with recycled content is such that the sum of post-consumer recycled and pre-consumer recycled content value constitute ≥ 30% of total cost value of interior fitout
1 Point: Where use of furniture and fitting materials, components and products with recycled content is such that the sum of post-consumer and pre-consumer recycled content value constitute ≥ 30% of total cost value of interior fitout

**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) with the contractor, subcontractors and suppliers.

The amounts and value of the recycled content of the materials must be documented by the project team.

**CONTINUED ON NEXT PAGE**
### INTERIORS
**MATERIALS & RESOURCES (MR)**

#### MR2 - RECYCLED CONTENT MATERIALS
(CONTINUED) 4 POINTS

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

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<th>REQUIREMENT</th>
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<tbody>
<tr>
<td>1</td>
<td>List and Cost anticipated material with recycled content to be used in the project.</td>
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<td>2</td>
<td>For each material establish the % Recycled Content by weight of post-consumer and/or pre-consumer recycled contents. Then establish the Recycled Content Value against cost of that material.</td>
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<tr>
<td>3</td>
<td>Provide Information on the sources/suppliers on the materials with recycled content.</td>
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<td>4</td>
<td>Submit by %, estimated total value of the materials with recycled content against the estimated total value of that floor, wall, ceiling or furniture and fittings component for the project.</td>
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**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)**

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<td>2</td>
<td>Calculation of the Recycled Content Value of each material must be provided.</td>
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<tr>
<td>3</td>
<td>Information on the sources/suppliers on the materials with recycled content must be provided.</td>
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<td>4</td>
<td>Determine the actual Total Cost materials with recycled content.</td>
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<td>5</td>
<td>Calculate % materials with recycled content = Total Cost materials with recycled content / Total Cost Value of interior fitout x 100%</td>
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<td>6</td>
<td>Describe any deviations or additions to the DA submission.</td>
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### NOTE
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INTERIORS
MATERIALS & RESOURCES (MR)

MR3  REGIONAL MATERIALS  1 POINT

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

DESCRIPTION
Use building interior materials, components and products that have been extracted and manufactured within Malaysia, thereby supporting the use of indigenous resources and reducing environmental impact resulting from transportation.

REQUIREMENTS
1 Point: Use local building interior materials, components and products that have been extracted, harvested, or recovered, as well as manufactured, within 500km radius of the project site for ≥ 50% (based on cost) of total cost value of interior fitout. Mechanical, electrical and plumbing components shall not be included. To include only materials permanently installed in the project.

APPROACH & IMPLEMENTATION
This point must be evaluated early in the design process so that materials, components and products that can be sourced locally can be established.

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 will focus their selection on the materials that will contribute the most to this point.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)
1. List and Cost of anticipated materials for the project that are extracted, harvested, recovered and manufactured within 500 km of the project site.
2. Establish the following:
   • Name of the manufacturer, AND
   • Product Cost, AND
   • The distance between the project site and the manufacturer.
3. Submit by %, estimated total value of regional materials against the estimated total value of interior fitout for the project.

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)
1. As built drawings or as built specifications including photographs confirming that the interiors have been constructed/installed in accordance with the design stage drawings/specifications.
2. Provide the following:
   • Name of the manufacturer, AND
   • Product Cost, AND
   • The distance between the project site and the manufacturer.
3. Determine the actual Total Cost of regional materials.
4. Calculate % regional materials = Total Cost regional materials / Total Cost Value of interior fitout x 100%
5. Describe any deviations or additions to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
MATERIALS & RESOURCES (MR)

MR4 | RAPIDLY RENEWABLE MATERIALS & SUSTAINABLE TIMBER | 3 POINTS

INTENT
To promote responsible forest management.

DESCRIPTION
Encourage use of rapidly renewable natural materials and non-wood based products to reduce environmental impact. These plant/animal based materials include, but are not limited to, agrifibres (byproducts of food harvesting), bamboo, cork, corn, cotton, linoleum, natural rubber, soy and wool. Essentially rapidly renewable materials must have a harvest cycle of less than 10 years and do not harm the animal upon harvesting.

Encourage environmentally responsible forest management. These components include, but are not limited to, structural framing and general dimensional framing if any, flooring, sub-flooring, wood doors and finishes. To include wood materials permanently installed and also temporarily purchased for the project. Compliance with Forest Stewardship Council (FSC) OR Malaysian Timber Certification (MTCC) Scheme requirements.

REQUIREMENTS
1 Point: for new building interior materials, components and products consisting of 75% rapidly renewable or non-wood based natural material, where its sum value is ≥ 10% of the total cost value of interior fitout

1 Point: Where ≥ 50% by volume of wood-based building interior materials, components, products and finishes used are certified, OR

2 Points: Where ≥ 75% by volume of wood-based building interior materials, components, products, and finishes used are certified.

APPROACH & IMPLEMENTATION
The goal in using rapidly renewable/non-wood based materials should be established during the design phase. The project team must identify materials with ≥ 75% content that is rapidly renewable/non-wood based and their availability should be coordinated (as early as possible) with the contractor, subcontractors and suppliers. The value of the material and amount of the rapidly renewable/non-wood content must be documented by the project team

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.

CONTINUED ON NEXT PAGE
## INTERIORS
### MATERIALS & RESOURCES (MR)

<table>
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<tr>
<th>MR4</th>
<th>RAPIDLY RENEWABLE MATERIALS &amp; SUSTAINABLE TIMBER (CONTINUED)</th>
<th>3 POINTS</th>
</tr>
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**REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**

1. List and cost all materials with ≥ 75% rapidly renewable or non-wood based content.
2. Submit by %, estimated cost of all rapidly renewable material/non-wood based products against the total cost value of interior fitout.
3. List and indicate the estimated volume all new wood based materials specified in the project and identify which components are FSC and MTCC certified.
4. Submit by %, estimated total volume of certified new wood based materials against the estimated total volume of wood based building interior material used in the interior fitout for the project.

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

1. As built drawings or as built specifications including photographs confirming that the interiors have been constructed/installed in accordance with the design stage drawings/specifications.
2. Provide Final List and volume of each wood based material used. Additionally provide vendors chain-of-custody (COC) number as per invoice to verify FSC and MTCC certifications.
3. Determine the actual Total Volume of wood based building interior material used.
4. Calculate % Certified Wood = \( \frac{\text{Volume of certified wood based building interior material}}{\text{Total Volume new wood based material}} \times 100\% \)
5. Describe any deviations or additions to the DA submission.

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**PROJECT NAME**

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**SUBMITTING PROFESSIONAL**

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**NOTE** ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
MATERIALS & RESOURCES (MR)

<table>
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<th>MR5</th>
<th>MATERIAL MANUFACTURE &amp; INGREDIENTS</th>
<th>2 POINTS</th>
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**INTENT**
To encourage use of environmentally preferred building interior materials, components and products for which life cycle information is available and that have preferred environmental, economic and social impacts. Includes all eco labels recognized by the Global Eco Labeling Network (GEN) as well as products listed in Green Pages Malaysia and accepted by GBI.

**DESCRIPTION**
Use building interior materials, components and products where their life cycle assessment has a reduced or favorable impact on the environment, thereby raising market demands for greener products and encouraging manufacturers to evaluate their own internal corporate social responsibility standards.

**REQUIREMENTS**
1 Point: Use ≥ 5 different, permanently installed building interior materials, components and products from manufacturers with verified commitment to responsible extraction/sourcing and manufacturing processes; whose product has minimal use and generation of harmful chemical substances.

1 Point: Use ≥ 10 different, permanently installed building interior materials, components and products from manufacturers with verified commitment to responsible extraction/sourcing and manufacturing processes; whose product has minimal use and generation of harmful chemical substances.

**APPROACH & IMPLEMENTATION**
To establish with ease, during design stages use any number of international eco-label directories including Green Pages Malaysia to select acceptable green building interior materials, components and products to complete the interior fitout.

**REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)**
1. List all proposed building interior materials, components, products specified in the project and identify the certification.
2. Include all available copies of product data sheet and eco-label certificate.

**REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)**
1. As built drawings or as built specifications including photographs confirming that the interiors have been constructed/installed in accordance with the design stage drawings/specifications.
2. Provide Final List of materials, components, and products;
3. Provide all copies of product data sheets and eco-label certificates.
4. Describe any deviations or additions to the DA submission

PROJECT NAME

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CLIENT

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INTERIORS
MATERIALS & RESOURCES (MR)

MR6 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) products: non-CFC and non-HCFC 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 exceed 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)
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)
1. Submit list of as-installed refrigerants and clean agents.
2. Describe any deviations or additions to the DA submission.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
GREEN BUILDING INDEX DESIGN REFERENCE GUIDE & SUBMISSION FORMAT

INTERIORS
WATER EFFICIENCY (WE)

WE1  WATER EFFICIENT LANDSCAPING & WATER FEATURE  1 POINT

INTENT
To encourage and recognise the design of landscaping and water feature 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 and water feature irrigation. This may be achieved through the use of native or adaptive plants or recycling waste or discharge water to reduce potable water consumption.

REQUIREMENTS
1 Point: For reducing potable water consumption for landscape and water feature irrigation by 30% or more. (e.g. Through use of native or adaptive plants to reduce or eliminate irrigation requirement. Encourage water recycling.)

APPROACH & IMPLEMENTATION
Design a water-efficient landscape by selecting native or adaptive plants that require minimal water and maintenance. Design a water-efficient water feature by use recycled or discharge water and minimal maintenance.

POTENTIAL TECHNOLOGIES & STRATEGIES
Determine and select appropriate plant material and design the landscape or water feature with native or adaptive plants to reduce or eliminate irrigation requirements.

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. A brief description of the system with reference to the Guidelines used, calculations, and an explanation of how the system meets the requirement for the credit.
2. A brief report by a landscape architect/Interior Designer 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)

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

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INTERIORS
WATER EFFICIENCY (WE)

WE2  WATER EFFICIENT FITTINGS  2 POINTS

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

To encourage efficient devices labelled under Water Efficient Product Labelling Scheme (WELPS) or adopt equivalent water efficiency standard.

REQUIREMENTS
1 Point: For all water closet and basin devices labelled under Water Efficiency Product Labelling (WELPS) or adopt equivalent water efficiency label
2 Points: For all water closet, basin, urinal, bidet, shower and tap devices labelled under Water Efficiency Product Labelling (WELPS) or adopt equivalent water efficiency label

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, basin tap, hand bidet or shower head or systems which has the potential to reduce potable water consumption.

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)

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)

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 and/or the fitting certificate 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.

NOTE ATTACH ALL SUBMITTALS WITH THIS COVER PAGE
INTERIORS
WATER EFFICIENCY (WE)

WE3 DRINKING WATER QUALITY 1 POINT

INTENT
To encourage use of the water supplied by local water authority for human consumption.
To reduce or discourage use of bottled drinking water.

DESCRIPTION
The main aim is to reduce bottled drinking water.
This may be achieved through the use efficient water filtering system.

REQUIREMENTS
1 Point: For water filtering system that produce suitable drinking water for human consumption.

APPROACH & IMPLEMENTATION
- 

REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)  SUBMITTER  OBI
1. A brief description of the filtering system with content analysis and to proof water quality suitable for human consumption. ○ ○
2. Submit proposed makes of the intended water filtering system. ○ ○

REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)  SUBMITTER  OBI
1. Submit manufacturer’s details and/or the fitting certificate of the installed water filtering system. ○ ○
2. Furnish photograph(s) of water filter system as installed. ○ ○
3. Describe any deviations or additions to the DA submission. ○ ○

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# INTERIORS

## INNOVATION (IN)

### IN1

#### INNOVATION & ENVIRONMENTAL DESIGN INITIATIVES

**9 POINTS**

### INTENT

Provide the design team and project the opportunity to be awarded points for exceptional performance above the requirements set by GBI rating system.

### DESCRIPTION

Reward innovation and initiatives.

### REQUIREMENTS

Encourage the design team by providing the opportunity to score points for exceptional performance above the requirements set by GBI rating system.

Project teams may submit any innovation items not listed below to GBI for consideration and approval. Innovation items shall be reviewed based on the impact they have on sustainable design and construction.

**1 Point** for each approved innovation and environmental design initiative up to a maximum of **9 Points**, such as, but not limited to:

- Night watchman software installed for auto lights off and appliances
- Sweeper for power off
- Special materials usage
- Zoning and deployment of special working environment – like activity based settings etc.
- Any energy reduction design elements like screening / space planning that minimises heat gain within the office environment
- Psycho escapism - use of color / green elements / art works / murals / paintings / etc.
- Harvesting light via design; vertical atriums;
- Rainwater harvesting
- Water recycling
- Metering & leak detection system
- 90% of the occupants seated with a view parallel to the outdoor

### APPROACH & IMPLEMENTATION

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

### REQUIRED SUBMISSION FOR DESIGN ASSESSMENT (DA)

1. Report on each innovation, how it is derived, and how it would assist in reducing energy consumption / overall environmental impact and improving sustainable design.

### REQUIRED SUBMISSION FOR COMPLETION & VERIFICATION ASSESSMENT (CVA)

1. Full documentation and photographic evidence of each innovation, and the process from commencement to commissioning, complete with drawings, manuals and maintenance write-up.
2. Describe any deviation or addition to the DA submission.

### NOTE

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### INTENT
To support and encourage the design integration required for Green Building Index rated Interior Space and to streamline the application and certification process.

### DESCRIPTION
Encourage and promote Accredited Green Building service providers.

### REQUIREMENTS
Support and encourage the design integration required for Green Building Index rated Interior Space 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)

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)

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

### INTERIORS INNOVATION (IN)

| IN2 | GREEN BUILDING INDEX FACILITATOR (GBIF) | 1 POINT |

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GSB would like to thank all contributors for efforts in preparing the INTERIORS Design Reference Guide Version 1.0. The following are the main contributors to the formation of this document:

### GBI INTERIORS DESIGN REFERENCE GUIDE

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<thead>
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<tbody>
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<td>MGBC</td>
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<td>Ir. Ahmad Izdihar</td>
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In addition, to the above GSB would like to also acknowledge and thank Lend Lease for allowing the use of materials (modified or other wise) from its office fitout on Level 31, Menara Binjai, in this Reference Guide.