

# Green Star - As Built Guidelines

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## Background

To assist all projects undertaking a Green Star - As Built Certified Rating, the GBCA has formulated a brief set of guidelines that clarify the requirements for submissions. The development of these guidelines was based on a number of workshops held with registered Green Star projects in conjunction with the criteria established in the Technical Manual. These brief guidelines are applicable to all projects regardless of whether they are undertaking a Shell & Core, Conventional Delivery or Integrated Fitout.

All projects, unless previously advised, must use these guidelines in addition to the criteria stated in the Technical Manual. Based on feedback from a number of projects, the GBCA will be releasing additional guidelines to address additional scenarios which do not easily fit within the scenario stated in this document.

## Additional Assistance

Where additional assistance is required, please contact your GBCA Case Manager.

## Definitions

The following terms are defined for purposes of Green Star as:

- 1) Shell and Core: Finishes and services are applied to common areas only. Tenancies are delivered with:
  - No ceilings, floor coverings, lighting systems and partition walls; and
  - Ducts from air supply and return risers finish within 1m of the face of the riser.
- 2) Conventional Delivery: Finishes and services are applied to common areas. Tenancies are delivered with:
  - Ceilings, floor coverings and lighting systems; and
  - Ducts from air supply and return risers, electrical and hydraulic services are installed above the ceiling from the riser throughout the tenancy areas.
- 3) Integrated Fitout: Where the tenancy design and construction is fully coordinated with the base building. This includes finishes, services and fitout to all areas, common and tenancy, with services fully installed at each floor. The definition of integrated fitout for purposes of Green Star is a tenancy space where:
  - All ceilings, floor coverings, lighting systems, mechanical, electrical and hydraulic services, partition walls, and finishes are installed.

## **Additional Submission Guidelines**

Projects must ensure that the documentation clearly shows where these guidelines are used to demonstrate compliance. The Certified Assessors can not make any assumptions with regards to the design, or installation of any item within a building, and can only assess what is being presented at the time of submission.

## Integrated Fitout Projects

Credit	Credit Name	Issue	Guideline
<b>Management</b>			
Man-2	Commissioning - Clauses	Evidence for commissioning requirements, within the Commissioning Report, must now apply not only to base building but also to tenant installed systems. Demarcation between the systems is often difficult to demonstrate.	For purposes of this Credit, the project must be commissioned as per the requirements of the Technical Manual, whereby the commissioning process is the major criteria.  The project will only need to commission the base building systems, or the level of systems implemented as part of the base building contract. Projects will not be penalised should they wish to go beyond this requirement.
Man-3	Commissioning - Building Tuning	Demarcation between the systems implemented by base building and the tenancy works are often difficult to demonstrate.  Where the tenancy works are undertaken separate to the base building works, it is unclear when the building tuning must be undertaken in such instances.	The project will only need to tune the base building systems, or the level of systems implemented as part of the base building contract. Projects will not be penalised should they wish to go beyond these requirement.  This credit requests a contractual requirement for a base building to be tuned to a set of criteria. The particular date at which the tuning process begins is irrelevant to this credit. The project team must show that the contract clearly shows a requirement for a building tuning process that will occur throughout 12 consecutive months once a set of criteria has been met.
Man-4	Commissioning - Commissioning Agent	Is the Commissioning Report required to incorporate the commissioning of all systems, including tenancy works? This will result in an increase in the Commissioning Agent's scope of works.	As per Man-2, the Credit's focus is on base building services. Hence, the Independent Commissioning Agent is not responsible for the commissioning of tenant-installed items. Should a project's commissioning report contain information on both base build and tenant



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			supplementary systems the project will not be adversely affected.
Man-7	Waste Management	As the project is an Integrated Fitout, construction waste will now include fitout waste.	<p>The project has the following options:</p> <ol style="list-style-type: none"> <li>Combine the waste from both base build and fitout, ensuring that over 80% of demolition and construction waste is recycled in total.</li> <li>Nominate a date when base building activities terminate and fitout construction activities commence and separate waste handling dockets as per this date.</li> <li>Separate and track recycling rates of waste streams for both base building and fitout construction.</li> </ol> <p>For option A, the project team must ensure that ALL the waste complies with the Credit Criteria. For options B &amp; C, the project team must clearly distinguish between base building and fitout waste.</p>
<b>Indoor Environmental Quality</b>			
IEQ-1	Ventilation Rates	<p>How do projects comply with outside air rates when they have both general and private offices?</p> <p>Office Design/As Built and Office Interiors stipulate varying requirements for the control of air supply. As meeting rooms will be implemented as part of the design, it is ambiguous which requirements must be met.</p> <p>Also, it becomes unclear what constitutes the occupancy rates and who defines it.</p>	<p>The main purpose of this Credit is to ensure the capacity of the base building services to provide the amount of outside air stipulated in the Credit Criteria.</p> <p>As this Credit differs between Green Star – Office and Green Star – Office Interiors, Projects must be aware that:</p> <ul style="list-style-type: none"> <li>For Office Design and As Built – this Credit measures the capacity of the base building HVAC system to provide the amount of air stipulated in the Credit Criteria.</li> <li>For Office Interiors – An additional requirement exists that the tenancy must also have the ability for air to</li> </ul>



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			<p>be controlled in the meeting rooms. For base building ratings, occupancy rates must be based on the relevant standard.</p>
IEQ-2	Air Change Effectiveness	As the building is an Integrated Fitout, As Built details will show fitout partitions. This may eradicate typical floor layouts and equate to additional areas that require modelling. Hence the potential for loss of points that may have otherwise been achieved is increased.	Projects can consider their space as 'open plan' for modelling purposes. Only structural and/or permanent partitions within their modelling must be included. Fitout partitions (unless the fitout partitions are "structural" or "permanent") may be excluded.
IEQ-3	Carbon Dioxide Monitoring and Control	Office Interiors stipulates requirements for the control of air supply to meeting rooms. As meeting rooms will be implemented as part of the design, CO <sub>2</sub> sensors will be required.	<p>For base building ratings (Office Design and As Built), CO<sub>2</sub> sensors are only required as stipulated in the Design and As Built Technical Manuals. Therefore, in base building ratings, CO<sub>2</sub> sensors are not required in the meeting rooms.</p> <p>For Office Interiors rating, CO<sub>2</sub> sensors are required in meeting rooms (if this Credit is being claimed).</p> <p>Where a project is claiming this Credit in Green Star - Office and Green Star - Office Interiors, the project can submit the Office Interiors documentation for Green Star - Office provided that compliance with the Credit Criteria for Green Star - Office is shown within it.</p>
IEQ-4	Daylight	As the building is an Integrated Fitout, partitions must now be included in the modelling. This may eradicate typical floor layouts and equate to additional areas that require modelling. Hence the potential for loss of points that may have otherwise been achieved is increased.	Projects can consider their space as 'open plan' for modelling purposes. Only structural and/or permanent partitions within their modelling must be included. Fitout partitions (unless the fitout partitions are "structural" or "permanent") may be excluded.
IEQ-6	High Frequency Ballasts	The Credit Criteria refers to the lighting within the NLA. For an Integrated Fitout, where the lighting	This Credit aims to ensure that any fluorescent lighting provided <b>as part of the base building</b> , as part of their



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		design includes task lighting and other tenant implemented lighting, high frequency ballasts are now required.	contract, complies with the Credit Criteria for this Credit. Lighting installed by tenant works is excluded from this credit.  Where the tenancy lighting complies with the requirements of this Credit, the submission can include documentation showing that this is the case. Otherwise, as built drawings can be marked up to indicate which light fittings have been provided/installed by base building works and which are provided by the tenant.
IEQ-7	Electric Lighting Levels	As the building is an Integrated Fitout, there are many more typical lighting layouts within the space. This equates to additional areas that require modelling and hence the potential for loss of points that may have otherwise been achieved is increased.	This Credit addresses the lighting levels over an open plan office area. Therefore, the modelling and calculations for this credit must be based on the general office designed and installed <b>as part of the base building</b> . Meeting rooms, boardrooms and other enclosed spaces that are part of the tenancy works can be excluded from this credit.  The project team must provide fitout documentation or base building documentation, demonstrating that the open plan areas meet the requirements of the Technical Manual.
IEQ-8	External Views	As the building is an Integrated Fitout, points for this Credit may be affected if as built drawings & the measurements take into the account the internal offices, partitions, furniture etc.	Projects can consider their space as 'open plan' for modelling purposes. Only structural and/or permanent partitions within their modelling must be included. Fitout partitions (unless the fitout partitions are "structural" or "permanent") may be excluded.
IEQ-9	Thermal Comfort	As the building is an Integrated Fitout, the as-built details will show that there are no typical floor levels. To demonstrated compliance with the Credit, CFD modelling of all areas (room by room flow) may be	Projects must show that each air conditioning zone meets the Credit Criteria. Where the finished space includes a zone that covers at least one meeting room, such zone must meet the Credit Criteria insofar as they are an



Credit	Credit Name	Issue	Guideline
		required. Hence the potential for loss of points that may have otherwise been achieved is increased.	existing zone. The partitions for this meeting room can be excluded from the calculations.
IEQ-10	Individual Comfort Control	Evidence of task air or alternate fitout system installation may be difficult to establish.	<p>This Credit can only be claimed if the system has been installed. Evidence of installation is required for a base building rating.</p> <p>Where the base building is paying for the system, but has not installed it, because of a request by the tenant, the base building must show a letter from the tenant/building owner stating that the system will be installed as part of their fitout.</p> <p>This Credit cannot be claimed for items installed by the tenant. Where the differentiation of who installed which items is difficult, receipts for the base building purchased system must be provided.</p>
IEQ-12	Internal Noise Levels	As the building is an Integrated Fitout and offices and meeting rooms will be implemented, the enclosed spaces will need to comply with the reverberation times stipulated for Office Interiors.	<p>The second point of this Credit applies to open plan areas within the office space. Hence, the project is only required to consider structural/permanent partitions for the base building rating.</p> <p>The project can show compliance through one of the following options:</p> <ol style="list-style-type: none"> <li>1) Testing of the open plan office area within a finished fitout as per the Technical Manual.</li> <li>2) Testing of the worst case scenario floor as a typical floor within a building. Testing for this floor must then be shown to be applicable to all additional floors.</li> <li>3) The acoustic consultant must provide a report showing how the design for this project was implemented, stating how it meets the relevant</li> </ol>



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Credit	Credit Name	Issue	Guideline
			Credit Criteria, and summarizing the relevant modelling done for this project.
IEQ-13	Volatile Organic Compounds	As the building is an Integrated Fitout, the Credit requirements will now be extended to all Fitout elements (paints, carpets, sealants) for VOC calculations.	Projects must ensure that all base building finishes that form part of their contract comply with the Credit Criteria for this Credit.  For a Green Star - Office Interiors rating, fitout items must be included.
IEQ-14	Formaldehyde Minimisation	As the building is an Integrated Fitout, the Credit requirements will now be extended to all Fitout elements for formaldehyde calculations, including tenant workstations, joinery etc.	Projects must ensure that all base building finishes that form part of their contract comply with the Credit Criteria for this Credit.  For the Office Interiors rating, fitout items must be included.
<b>Energy</b>			
Ene-1 & 2	Energy & Energy Improvement	As the building is an Integrated Fitout, the as-built details will show all partitions and hence no typical floor levels. This will mean that there are potentially more zones than the modelling programs can handle.	Projects must undertake modelling as per the ABGR/NABERS Energy protocols. There is no change from stated Criteria.  Partitions do not need to be included.  Documentation requirements will be in accordance with the Technical Manual. With regards to the commissioning report, this is limited to all items installed as part of the base building.
Ene-5	Office Lighting Power Density	As the building is an Integrated Fitout, partitions must now be included in the modelling. This equates to more areas that require modelling which increases the overall cost of modelling. Points under this Credit generally become too difficult to achieve.	This Credit addresses the lighting levels over an open plan office area. Therefore, the modelling and calculations for this Credit must be based on the general office designed and installed as part of the base building. Meeting rooms, boardrooms and other enclosed spaces





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			<p>that are part of the tenancy works can be excluded from this Credit.</p> <p>The project team must provide fitout documentation or base building documentation, demonstrating that the open plan areas meet the requirements of the Technical Manual.</p>
<b>Water</b>			
Wat-3	Landscape Irrigation Water Efficiency	Where there are indoor plants, points become difficult to achieve if the irrigation system is to extend to the tenant's pot plants.	Project's irrigation water efficiency does not extend to the tenant's indoor plants, unless an internal irrigation system is being installed <b>as part of the base building</b> .
<b>Materials</b>			
Mat-6	Recycled Content of Steel	Points will become difficult to achieve if the recycled content of steel is to include structural and supporting steel, such as stud walls, implemented by the Fitout works.	This Credit refers primarily to structural elements and/or permanent partitions only, not fitout partitions (unless the fitout partitions are 'structural' or 'permanent').
Mat-7	PVC Minimisation	As the building is an Integrated Fitout, there will now be an additional requirement to include all fitout elements in PVC calculations, including blinds, furniture etc.	<p>Projects must ensure that all base building elements that form part of their contract comply with the Credit Criteria for this Credit.</p> <p>For the Office Interiors rating, Fitout items must be included.</p>
Mat-8	Sustainable Timber	As the building is an Integrated Fitout, sustainable timber calculations are to include all fitout elements/tenant items, such as workstations etc.	<p>Projects must ensure that all base building elements that form part of their contract comply with the Credit Criteria for this credit.</p> <p>For the Office Interiors rating, Fitout items must be</p>



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			included.
<b>Emissions</b>			
Emi-1	Refrigerant ODP	As the building is an Integrated Fitout, refrigerant ODP calculations are to include refrigerant levels of supplementary system refrigerants.	For base building ratings, supplementary systems that are installed by the tenant do not need to be included.  Otherwise, all refrigerants need to be included, as per the requirements of the Technical Manual.
Emi-2	Refrigerant GWP	As the building is an Integrated Fitout, refrigerant GWP calculations are to include refrigerant levels of supplementary system refrigerants.	For base building ratings, supplementary systems that are installed by the tenant do not need to be included.  Otherwise, all refrigerants need to be included, as per the requirements of the Technical Manual.
Emi-9	Insulant ODP	As the building is an Integrated Fitout insulant ODP calculations are to include insulant levels of supplementary system insulants.	For base building ratings, supplementary systems that are installed by the tenant do not need to be included.  Otherwise, all insulants need to be included, as per the requirements of the Technical Manual.



## Shell & Core Projects

Credit	Credit Name	Issues	Comments
<b>Management</b>			
Man-2	Commissioning - Clauses	Projects cannot demonstrate that comprehensive pre-commissioning, commissioning & quality monitoring has been undertaken as services are not installed as part of Shell & Core works. Building owner will not receive any commissioning reports of As-Built drawings of the works as no services are installed as part of Shell & Core works.	For a Shell and Core project, the extent of installed services will be less than that of a fully serviced building. This Credit addresses the commissioning of installed systems, as such, only those installed <b>as part of the base building</b> must be commissioned in order to achieve this Credit. The submission must demonstrate that: <ul style="list-style-type: none"> <li>- The installed services <b>as part of the base building</b> have been commissioned;</li> <li>- The building owner has received the commissioning reports and as-built drawings of all installed services.</li> <li>- All other Compliance Requirements for this Credit have been addressed as per the Technical Manual of the registered Tool.</li> </ul>
Man-3	Commissioning - Building Tuning	Evidence of building tuning (pre occupancy) & final commissioning cannot be demonstrated. Evidence of building tuning process cannot be demonstrated.	For a Shell and Core project, the extent of installed services will be less than that of a fully serviced building. This Credit addresses the commissioning of installed systems, as such, only those installed <b>as part of the base building</b> must be commissioned in order to achieve this Credit. The submission must demonstrate that: <ul style="list-style-type: none"> <li>- The installed services <b>as part of the base building</b> have been commissioned;</li> <li>- The building owner has received the commissioning reports and as-built drawings of all installed services.</li> </ul>



Credit	Credit Name	Issues	Comments
			- All other Compliance Requirements for this Credit have been addressed as per the Technical Manual of the relevant Tool.
Man-5	Building Users Guide	Building Users Guide cannot be completed, as the services are not installed as part of shell & core works.	The Building Users Guide must clearly meet the requirements of the Technical Manual for the services installed <b>as part of the base building</b> . It is expected that the Building Users Guide will provide the relevant information for a future tenant to determine the amount of works required to ensure that the systems installed as part of the base building are used correctly.
<b>Indoor Environmental Quality</b>			
IEQ-1	Ventilation Rates	As the building is a Shell & Core and services are not fully installed as part of shell & core works, projects cannot demonstrate the level of air provided.	Projects will need to show capacity of the base building HVAC system to provide the amount of air stipulated in the Credit Criteria of the Technical Manual of the relevant Tool.
IEQ-2	Air Change Effectiveness	As the building is Shell & Core, a CFD model will demonstrate no purpose as there is no air distribution throughout the space. Services drawings will show nothing installed in the NLA areas.	Projects that have no installed mechanical ventilation systems cannot claim this Credit. Where the system is incomplete, this credit cannot be claimed.  Certain systems, such as an underfloor system, or a chilled beam system can be considered part of a shell and core building depending on the particulars of their installation. If unsure, projects should contact their case manager.
IEQ-3	Carbon Dioxide Monitoring and Control	As the building is a Shell & Core and services are not fully installed as part of shell & core works, As built drawings will not show any services. Hence projects will find it difficult to claim this Credit.	Projects will need to show that they have the capacity to install CO <sub>2</sub> sensors. This can be depicted in the Building Users Guide.  Otherwise, projects cannot claim this Credit.



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Credit	Credit Name	Issues	Comments
IEQ-4	Daylighting	As there are generally no ceilings or finished floors as part of the shell & core works, the daylight model will not adequately model the finished space. Slab to slab will be used in the modelling which means that the DF is compromised due to the increased floor to 'ceiling' height. As there are no floor finishes, the reflectance values of floors, as prescribed in the Technical Manual, do not reflect concrete.	Projects can consider their space as 'open plan' for modelling purposes. Only structural and/or permanent partitions within their modelling must be included. Fitout partitions (unless the fitout partitions are "structural" or "permanent") may be excluded. A shell and core project must use the default values as stated in the Technical Clarifications for this Credit.
IEQ-5	Daylight Glare Control	As the building is a Shell & Core and the assessment is based on the finished design, projects may find it difficult to claim this Credit where no glare control devices are installed as part of the shell & core works.	Shell & Core project that do not install any glare control devices, as per the requirements of the Technical Manual, cannot claim this Credit.
IEQ-6	High Frequency Ballasts	As there are no lights installed. Summary calculation sheet will show 0 fittings, certification will be useless.	Projects will need to supply high frequency ballasts to <u>any</u> fluorescent lighting provided <b>as part of the base building</b> , as part of their contract. This can include lighting outside the Net Lettable Area.  Where no fluorescent lights have not been installed, the Credit can be claimed, and a point will be rewarded..
IEQ-7	Electric Lighting Levels	As there are no lights installed. This credit does not make sense in delivery.	Projects that do not have a lighting system cannot claim this Credit.
IEQ-9	Thermal Comfort	As the building is Shell & Core, a CFD model will demonstrate no purpose as there is no air distribution throughout the space. Services drawings will show nothing installed in the NLA areas. A shell & core building cannot achieve this credit, no matter where the supply & return risers are.	Projects that have no installed mechanical ventilation systems cannot claim this Credit. Where the system is incomplete, this credit cannot be claimed.  Certain systems, such as an underfloor system, or a chilled beam system can be considered part of a shell and core building depending on the particulars of their installation. If unsure, projects should contact their case manager.



Credit	Credit Name	Issues	Comments
IEQ-10	Individual Comfort Control	As the building is a Shell & Core and services are not fully installed as part of shell & core works, projects cannot demonstrate the level of air provided.	<p>Projects that have no installed mechanical ventilation systems cannot claim this Credit. Where the system is incomplete, this credit cannot be claimed.</p> <p>Certain systems, such as an underfloor system, or a chilled beam system can be considered part of a shell and core building depending on the particulars of their installation. If unsure, projects should contact their case manager.</p>
IEQ-12	Internal Noise Levels	For a Shell & Core fitout, carpets & ceilings are not installed. The supply & return ducts end at risers. The noise levels cannot meet the ambient noise conditions as the acoustic design is based on the fitout.	Shell and Core projects are unlikely to achieve the second point for this Credit. There is no change from the stated criteria.
<b>Energy</b>			
Ene-1 & Ene-2	Energy & Energy Improvement	For a Shell & Core fitout, commissioning cannot be conducted to demonstrate the configuration of the air distribution throughout the space. Base building services such as chillers, boilers and pumps are installed.	<p>Projects must undertake modelling as per the ABGR/NABERS Energy protocols. There is no change from stated criteria.</p> <p>As per the Technical Clarification Ene-General #1: "The '12w/m2' figure for tenancy lighting density loads mentioned in Chapter Five of the ABGR Validation Protocol for Computer Simulations and the NABERS Energy Guide to Building Energy Estimation is applicable to "shell and core buildings" only. All other buildings must use their design loads + 1w/m2, as stated in the same document."</p> <p>With regards to the documentation required, the project must submit what is required in the Technical Manual. With regards to the commissioning report, this is limited to all installed items as part of the base building.</p>



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Ene-5	Office Lighting Power Density	As there are no lights installed, lighting power densities for 95% of the NLA cannot meet the Criteria.	Projects that do not have a lighting system cannot claim this Credit.
Ene-6	Office Lighting Zoning	As there are no lights installed, this Credit does not make sense in delivery.	Projects that do not have a lighting system cannot claim this Credit.
<b>Water</b>			
Wat-4	Cooling Tower Water Consumption	As the building is a Shell & Core fitout, there are no cooling requirements and the contractors are unable to commission the dosing to demonstrate that 6 cycles is achieved. Can commission the flow if they close the loop, but the problem is the dosing.	Projects will need to commission to the maximum level possible. While specific loads may not be achievable, the commissioning for this equipment must still show that the equipment can operate as per the intended design.