



SUPPLEMENT FOR EDGE USER GUIDES V.2.0 AND V.2.1

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Refer to the EDGE website for the most recently published supplement



Creating Markets, Creating Opportunities

INTRODUCTION

This Supplement to the User Guides is a live document that should be referred to along with the EDGE User Guides. The Supplement covers all building types and will be updated regularly while the User Guides will be updated less frequently. The Supplement contains important corrections and clarifications sought by users, and any major new updates such as new measures. Updates from the Supplement will migrate to the next version of the User Guides.

The Supplement has three parts:

- I. Errata: List of corrections to the User Guide.
- II. Addendum: Additional material that serves to clarify the intent of the original text and the use of the EDGE App.
- III. What's New: Significant new developments in the EDGE App such as new measures, capabilities or country-specific developments.

1. ERRATA

ALL User Guides		
Location	ERRATUM	REPLACE WITH
Multiple	Table numbers referenced in the text are at times not matched correctly with the Table numbers in the captions.	<i>In most cases, the tables and the accompanying text descriptions are in the same location. The next version of the User Guide will contain updated Table references.</i>
Multiple	U Value	U-value wherever it appears in the text
INTRODUCTION, EDGE Assessment and Certification definitions	Area limits for mixed use buildings: If a building has more than one use and the secondary use occupies less than 200 m² , the entire building can be certified under the primary use of building. If the area of secondary use is more than 200 m² , then that portion should be certified separately. For example, a 10,000 m ² residential building, with a retail portion of 300 m² located within the ground floor, would be certified in separate Homes and Retail EDGE Certificates.	Area limits for mixed use buildings: If a building has more than one use and the secondary use occupies less than 10% of the floor area up to a maximum of 1000 m² , the entire building can be certified under the primary use of building. If the area of secondary use is more than 10% of the floor area or more than 1000 m² , then that portion should be certified separately. For example, if a 10,000 m ² residential building has a retail portion of 1,200 m² located within the ground floor, the building areas would be certified separately with Homes and Retail EDGE Certificates.
INTRODUCTION, EDGE Assessment and Certification definitions	Multiple buildings: When one project (such as a housing development), with a single owner, consists of a number of buildings, these buildings of less than 200 m² with the same use may be clustered together as a single building. Buildings larger than 200 m² would be considered as separate buildings. In residential projects, however, each individual unit would receive EDGE certificate, not the overall building. When there are multiple types of units, each unit is assessed separately.	Multiple buildings: When one project (such as a housing development), with a single owner, consists of a number of buildings, buildings of less than 10% of the floor area of the project up to a maximum of 1000 m² with the same use may be clustered together as a single building. Buildings larger than 10% or more than 1000 m² would be considered as separate buildings. In residential projects, however, each individual unit would receive EDGE certificate, not the overall building. When there are multiple types of units, each unit is assessed separately.
Only for version 2.1 APPENDIX 2: DETAILED LIST OF MATERIALS, Multiple locations	<i>Default thicknesses and embodied energy values for several materials in the User Guide Appendix do not match the values being modeled in version 2.1.</i>	<i>Updated values are being used for version 2.1 in the App. A new version of the Appendix will be made available with the User Guide for version 2.1.</i>

HOMES User Guide		
Location	ERRATUM	REPLACE WITH
Page 12, DESIGN PAGE GUIDANCE, Area Details	External Wall Length m/Unit – This length assumes a ratio of 1.5:1. In most cases there is no need to update this value. However, to calculate this value, the one typical floor total external wall length can be divided by number of units. The idea is to capture the majority of units. So if there are same size units i.e. one bedrooms with different external wall length an average value should be entered.	External Wall Length m/Unit – This is the weighted average length of the external walls per residential unit. The EDGE default assumes an aspect ratio of 1.5:1 in plan view. To calculate a value that represents the majority of units being modeled, divide the total external wall length for those units in a typical floor by the number of units. For example, for an EDGE model for one-bedroom units, take the total external wall length for the one-bedroom units on a typical floor and divide by the number of one-bedroom units on that floor.
Energy Measures, REFLECTIVE PAINT/TILES, For Walls and Roof	Solar Reflectivity	Replace with Solar Reflectance Index (SRI) wherever it appears in the text for this measure.
Energy Measures, REFLECTIVE PAINT/TILES, Compliance Guidance	Other values that may be provided by a manufacturer include the emittance, the solar reflectance index , or gloss units.	Other values that may be provided by a manufacturer include the emittance, the solar reflectivity , or gloss units.
Page 43, HME09 – NATURAL VENTILATION, Potential Technologies/Strategies, Table 18	Bathroom <15 W/m² 10%	<i>This measure does not apply to bathrooms.</i>
Page 44, HME10 – CEILING FANS IN ALL HABITABLE ROOMS, Potential Technologies/Strategies	In order to achieve the levels of air movement assumed by EDGE, Table 19 shows the optimum number of fans and fan diameter (as measured from the center of the fan to the tip of the blade) required in different sizes of rooms.	To achieve the levels of air movement assumed by EDGE, Table 19 shows the fan diameter (also known as ‘total blade span’, which is 2 times the radius as measured from the center of the fan to the tip of the blade) and the optimum number of fans required for different sized rooms.
Page 69, HMW04 – DUAL FLUSH FOR WATER CLOSETS, Approach/Methodologies	The measure can be claimed if the main flush is less than the base case of 9 liters...	The measure can be claimed if the main flush is less than the base case of 8 liters ...
Page 70, HMW05 – SINGLE FLUSH FOR WATER CLOSETS, Approach/Methodologies	The measure can be claimed if the flush volume is lower than the base case of 9 liters...	The measure can be claimed if the flush volume is lower than the base case of 8 liters ...

HOTELS User Guide

Location	ERRATUM	REPLACE WITH
Page 28, HTE03 – INSULATION OF ROOF SURFACES, Potential Technologies/Strategies	Measure HTE05 assumes an improved roof U Value, which varies upon location.	Measure HTE03 assumes an improved roof U-Value, which varies by location.

OFFICES User Guide

Location	ERRATUM	REPLACE WITH
DESIGN PAGE GUIDANCE Building Orientation	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. If actual values are known, they should be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. For most buildings, it is recommended that these be left as default values. If the building is a regular box shape with no angles or cut-outs and actual values are known, they can be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here. Note that when building orientation is changed, the default Building Lengths also get swapped. However, if these fields contain User Entries, the Building Lengths do not get swapped automatically; they should be corrected manually when changing the orientation.
Energy Measures, REFLECTIVE PAINT/TILES, For Walls and Roof	Solar Reflectivity	Replace with Solar Reflectance Index (SRI) wherever it appears in the text for this measure.
Energy Measures, REFLECTIVE PAINT/TILES, Compliance Guidance	Other values that may be provided by a manufacturer include the emittance, the solar reflectance index , or gloss units.	Other values that may be provided by a manufacturer include the emittance, the solar reflectivity , or gloss units.
Page 45, OFE10 – CEILING FANS IN ALL OFFICE ROOMS, Potential Technologies/Strategies	In order to achieve the levels of air movement assumed by EDGE, Table 19 shows the optimum number of fans and fan diameter (as measured from the center of the fan to the tip of the blade) required in different sizes of rooms.	To achieve the levels of air movement assumed by EDGE, Table 19 shows the fan diameter (also known as ‘total blade span’, which is 2 times the radius as measured from the center of the fan to the tip of the blade) and the optimum number of fans required for different sized rooms.

RETAIL User Guide		
Location	ERRATUM	REPLACE WITH
DESIGN PAGE GUIDANCE Building Orientation	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. If actual values are known, they should be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. For most buildings, it is recommended that these be left as default values. If the building is a regular box shape with no angles or cut-outs and actual values are known, they can be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here. Note that when building orientation is changed, the default Building Lengths also get swapped. However, if these fields contain User Entries, the Building Lengths do not get swapped automatically; they should be corrected manually when changing the orientation.
Energy Measures, REFLECTIVE PAINT/TILES, For Walls and Roof	Solar Reflectivity	Replace with Solar Reflectance Index (SRI) wherever it appears in the text for this measure.
Energy Measures, REFLECTIVE PAINT/TILES, Compliance Guidance	Other values that may be provided by a manufacturer include the emittance, the solar reflectance index , or gloss units.	Other values that may be provided by a manufacturer include the emittance, the solar reflectivity , or gloss units.
Page 79 RTW01, Measure Name	RTW01 – DUAL FLUSH FOR WATER CLOSETS	RTW01 – DUAL FLUSH FOR WATER CLOSETS IN ALL BATHROOMS
Page 82 RTW03, Measure Name	RTW03 – AERATORS FOR FAUCETS/AUTO SHUT-OFF FAUCET	RTW03 – AERATORS & AUTO SHUT-OFF FAUCETS IN ALL BATHROOMS
Page 91 RTW10, Measure Name	RTW10 – RECYCLED GREY WATER FOR FLUSHING, LANDSCAPE & HVAC	RTW10 – GREY WATER TREATMENT AND RECYCLING SYSTEM
Page 93 RTW11, Measure Name	RTW10 – RECYCLED BLACK WATER FOR FLUSHING, LANDSCAPE & HVAC	RTW10 – BLACK WATER TREATMENT AND RECYCLING SYSTEM

HOSPITALS User Guide

Location	ERRATUM	REPLACE WITH
DESIGN PAGE GUIDANCE Building Orientation	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. If actual values are known, they should be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths – Based on the earlier selections and entered total area, the default building lengths in each orientation are provided. For most buildings, it is recommended that these be left as default values. If the building is a regular box shape with no angles or cut-outs and actual values are known, they can be entered in the “User Entry” section. All façade lengths in one orientation should be added up, e.g. if there are three north facing exterior wall segments, they should be added up before entering here. Note that when building orientation is changed, the Building Lengths also get swapped. However, if these fields contain User Entries, the Building Lengths do not get swapped automatically; they should be corrected manually when changing the orientation.
Energy Measures, REFLECTIVE PAINT/TILES, For Walls and Roof	Solar Reflectivity	Replace with Solar Reflectance Index (SRI) wherever it appears in the text for this measure.
Energy Measures, REFLECTIVE PAINT/TILES, Compliance Guidance	Other values that may be provided by a manufacturer include the emittance, the solar reflectance index , or gloss units.	Other values that may be provided by a manufacturer include the emittance, the solar reflectivity , or gloss units.

2. ADDENDUM

ALL User Guides		
Location	ORIGINAL	ADDENDUM
INTRODUCTION, EDGE Methodology	The purpose of EDGE is to produce consistent and reliable evaluations of resource demand for building certification purposes. While EDGE may assist the design process, it is first and foremost a financial model and should not be used for making strategic design decisions. If the performance of a particular feature is critical to the design, it is prudent to use an appropriate modelling tool. In any case, EDGE should not be used for system sizing or financial modeling.	The purpose of EDGE is to produce consistent and reliable evaluations of resource demand for building certification purposes. While EDGE assists the design process, it is first and foremost a model for directional financial comparisons. However, it should not be used for making decisions that require a finer level of detail. If the performance of a particular feature is critical to the project, it is prudent to use an appropriate modelling tool. For example, EDGE should not be used for system sizing, or precise payback calculations to be used in financial decision-making. EDGE uses the best available information for default values that are global or local averages. The EDGE database is updated on an ongoing basis as new and better information comes in. To share any updates with the EDGE team, such as local rates for energy and water, please send relevant documentation to edge@ifc.org.
INTRODUCTION, EDGE Methodology	Virtual energy will be shown as energy saving however it does not contribute savings to utility bills.	Virtual energy will be shown as energy saving however it does not contribute savings to utility bills. Changing the source of fuel type may change the system selection and the amount of virtual energy estimated.
DESIGN PAGE GUIDANCE, Project Details	• Project Address	• Project Address • Project Stage – Enter ‘Preliminary’ for projects in the design stage of new construction or renovation, and ‘Post-Construction’ for new construction projects that have been completed and for existing buildings. • Year of completion – This field will appear only when Project Stage > Post-Construction is selected, and applies to all projects. Enter the year the project was completed.

ALL User Guides

DESIGN PAGE GUIDANCE, Building Data	No. of Floors (Above Ground/ Below Ground) – Enter the number of floors for the entire area of building that is covered by the assessment.	No. of Floors – Enter the number of floors for the entire area of building that is covered by the assessment. For buildings with a different number of floors in different areas, use the weighted average number of floors. For projects being modeled in sections with multiple EDGE models, the Floors field should only show the number of Floors that section represents. For example, if residential units are being modeled separately, the Floors field should only show the number of Floors that unit appears in.
DESIGN PAGE GUIDANCE, Building Data	<i>Total Area, expressed as Average Unit Area (Homes), Total Area (Hospitals), Built-up Area (Retail), Built-up Area Excluding Car Parking (Offices), or Master Project Area (Hotel)</i>	Note that this is the Gross Internal Area or GIA as measured from the inside of the external walls. Distances to interior walls are measured on center.
Page 12, DESIGN PAGE GUIDANCE, Key Assumptions for the Base Case	The default values are used to calculate the base case performance of a building. If any of the values are overwritten, justification must be provided in the form of supporting documentation, including a link to any relevant local standards.	The default values are used to calculate the base case performance of a building. EDGE uses the best available information for default values. But energy and water rates can change with time or location. Therefore, EDGE provides users with the ability to update the default values for their project. If any of the values are overwritten, justification must be provided in the form of supporting documentation, including a link to any relevant local standards.
Page 15, GREEN MEASURES GUIDANCE, Required Measures	Table Column: How to Address at Audit: Must be reviewed in all projects and if not selected should be advised to be selected and actual number as per design or construction must be entered in the field	Table Column: How to Address at Audit: Must be reviewed in all projects and if not selected should be advised to be selected and actual number as per design or construction must be entered in the field. Note that in the case of walls and roof, it is only required when the U-value of the base case is less than 0.5W/m²K; and in the case of windows, when the U-value is less than 3W/m²K.

ALL User Guides

Page 15, GREEN MEASURES GUIDANCE, Results	The KPIs include*: - Incremental Cost - Additional cost of implementing the selected efficiency measures (in USD or local currency in specific countries). - Payback in Years – Number of years to repay the incremental cost compared to the cost saving of utilities. <i>* now also added to the Homes tool</i>	The KPIs include: - Incremental Cost - Additional cost of implementing the selected efficiency measures. (in USD or local currency in specific countries). Certain building measures may contribute to a lower overall cost compared to the baseline. Therefore, negative incremental costs are possible. EDGE cost data is based on average global data and is continuously being refined. It is only meant as a guidance tool for comparison between measures. If specific local data is available, the use of it in a more specific financial model is encouraged for making financial decisions. - Payback in Years – Number of years to repay the incremental cost compared to the cost saving of utilities. The method used is simple payback based on the capital cost of the measure.
Page 15, GREEN MEASURES GUIDANCE, Energy and Water	While not technically efficiency measures, onsite renewable energy and the collection of rainwater will reduce the use of grid electricity and treated potable water respectively, contributing to the 20% efficiency savings target required to reach the EDGE standard.	While not technically efficiency measures, onsite renewable energy and the collection of rainwater will reduce the use of grid electricity and treated potable water respectively, contributing to the 20% efficiency savings target required to reach the EDGE standard. Other innovative measures impacting energy or water savings can be reported using a proxy measure (by selecting a substitute from the options available in EDGE), and will be evaluated on a case by case basis.
Multiple, MEASURES, Compliance Guidance	At the design stage one of the following must be used to demonstrate compliance: Bill of quantities ...	At the design stage one of the following must be used to demonstrate compliance: Bill of quantities This would be the document used in tendering of construction comprising a list of the materials required for the works and their estimated quantities. Similar locally used documents such as drawings or invoices may also be used to verify the construction details.

ALL User Guides

Energy Measure, REDUCED WINDOW TO WALL RATIO, Approach/Methodologies	Glazing area is the area of glass on all façades regardless of orientation. Gross exterior wall area is also the sum of the area of the façade in all orientations.	Glazing area is the sum of the area of glass on all façades regardless of orientation. Gross exterior wall area is the sum of the area of the façade in all orientations. For projects being modeled in sections with multiple EDGE models, the recommended method is to calculate an average WWR for the whole building and use that in every model. Modeling each model with its own window-wall ratio is also acceptable, but unless there is a big difference in the models with some containing double height spaces or very different glass areas, it is not recommended. For example, if the average WWR of a residential building is 35%; that will be used for all unit types regardless of their individual WWR. (However, individual window opening sizes will be considered for the natural ventilation measure.)
Energy Measure, INSULATION OF ROOF, Intention	... A well-insulated building has lower cooling and/or heating energy requirements.	... A well-insulated building has lower cooling and/or heating energy requirements. Please note that many modern insulating materials as well as air cavities that improve the sustainability and energy efficiency of buildings also spread fire more easily than traditional materials such as concrete and wood. The project team is encouraged to take proper fire safety precautions in the selection of these materials and the associated design details.
Energy Measure, INSULATION OF EXTERNAL WALLS, Intention	... A well-insulated building has lower cooling and/or heating energy requirements.	... A well-insulated building has lower cooling and/or heating energy requirements. Please note that many modern insulating materials as well as air cavities that improve the sustainability and energy efficiency of buildings also spread fire more easily than traditional materials such as concrete and wood. The project team is encouraged to take proper fire safety precautions in the selection of these materials and the associated design details.

ALL User Guides

Energy Measure, SOLAR PHOTOVOLTAICS, Approach/Methodologies	In order to claim this measure, the design team needs to indicate the proportion of electricity demand that they would like to offset with the PV installation.	To claim this measure, the design team needs to indicate the proportion of electricity demand that they would like to offset with the PV installation. This is the percentage of the annual electricity use (expressed in kWh/year). This % can be calculated using the EDGE improved case consumption for the project, and the projected annual production from the PV system. For example, if the project baseline use is 100 kWh/year, and the PV system will generate 10 kWh/year, 10% should be input into the model. For projects being modeled in parts with multiple EDGE models, a total value should be calculated for the whole project and this value should be input into every model.
Water Efficiency Measures, <i>Introductory text</i>	Required measures does not mean the improved Case flow rates should be met, rather the actual flow rate of water fixtures should be entered to the software.	Required measures does not mean the improved Case flow rates should be met, rather the actual flow rate of water fixtures should be entered in the software. If the final installed fixtures have varying flow rates for any reason, a weighted average of the flow rates should be used.
Water Measures, FAUCET MEASURES, Requirement Summary	The actual flow rate of kitchen sinks faucets should be entered into the software in all cases, irrespective of the value. Savings can be achieved if the flow rate of the faucets specified for the kitchen sinks is less than the base case. <i>(or similar language depending on building and room typology)</i>	The actual flow rate of kitchen sinks faucets should be entered into the software in all cases, irrespective of the value. Savings can be achieved if the flow rate of the faucets specified for the kitchen sinks is less than the base case. <i>(or similar language depending on building typology)</i> In some cases, these savings are not applicable. For instance, in a retail building without a food court, there will be no kitchen water faucets and therefore, no savings from a kitchen water faucet measure.

ALL User Guides

Materials Efficiency Measures, (Introduction)

All materials measures marked with an asterisk (*) on the measure name such as HMM01* should be selected as per actual building conditions.

All materials measures marked with an asterisk (*) on the measure name such as HMM01* should be selected as per actual building conditions.

For building elements where more than one material may be selected, a second predominant material that covers more than 25% of the area can optionally be indicated and marked with its percentage (%) area in the total project. Any additional materials beyond the first two should be represented by the one of the two selected materials that is nearest to it in embodied energy. For projects being modeled in parts with multiple EDGE models, the preferred method is to calculate the average distribution of materials over the entire project and use the same selections and % figures across all models.

EDGE provides default embodied energy values for the materials based on the EDGE Emerging Economies Construction Dataset (The EDGE materials methodology report is available online at the EDGE website). Embodied energy values can vary widely based on the assumptions made and using a standardized dataset ensures that each material is evaluated following the same methodology for a fair comparison in EDGE. To ensure consistency, EDGE does not allow the addition of a custom material at this time.

Materials, FLOOR SLABS, Approach/Methodologies

The specification for the floor slab should be that of the intermediary floor and not the ground floor, as the ground floor slab is often dictated by the ground conditions.

The specification for the floor slab should be that of the intermediary floor and not the ground floor, as the ground floor slab is often dictated by the ground conditions. **The thickness should only include the structural slab. Do not include the thickness of the concrete used to level the floor slab for the finished flooring; it is included in the embodied energy of the Flooring (**M05).**

ALL User Guides

Materials, ROOF CONSTRUCTION, Approach/Methodologies	The design team should select the specification that most closely resembles the roof specified, and enter the thickness, which is a requirement of EDGE. Where there are multiple specifications the predominant specification should be selected.	The design team should select the specification that most closely resembles the roof specified, and enter the thickness, which is a requirement of EDGE. Where there are multiple specifications the predominant specification should be selected. In the Energy tab, a weighted average can be used for the specifications such as SRI and U-value. This applies for Green Roofs as well. To specify a Green Roof, adjust these values in the Energy tab: (1) Reflectivity of the roof (use the default of 70% if actual value is not available) and (2) Insulation of the roof (U-value) to define the green roof condition. In the Materials tab, under Roof insulation, select the insulation type used in the roof assembly.
Materials, ALL MATERIAL TYPES except insulation, Potential Technologies/ Strategies	--	Material: Re-use of existing material Description: Re-using an existing material avoids the use and therefore, embodied energy, of new materials. The re-use of existing materials option in EDGE is highly desirable and assigned an embodied energy value of zero (0).
Appendix 2: Detailed List of Materials, ALL MATERIAL TYPES except insulation	--	<i>Please see the Appendix in this supplement for "NEW OPTION FOR MATERIALS"</i>

HOMES User Guide

Location	ORIGINAL	ADDENDUM
INTRODUCTION, About EDGE	The EDGE software will soon include modules for hospitals, offices, hotels, and retail, with building-specific user guides accompanying them. This guide is specifically for new homes construction .	The EDGE software includes modules for homes, hospitals, offices, hotels, and retail, with building-specific user guides accompanying them. This guide is specifically for homes . EDGE can be used to certify single family homes or apartment buildings at any stage of their life cycle. This includes new construction, existing buildings, and major renovations.
Page 9 INTRODUCTION, EDGE Assessment and Certification definitions	Multiple buildings: ... In residential projects, however, each individual unit would receive EDGE certificate, not the overall building. When there are multiple types of units, each unit is assessed separately.	Multiple buildings: ... In residential projects, however, each individual unit would receive EDGE certificate, not the overall building. When there are multiple types of units, each unit is assessed separately. If the apartment types have a less than 10% difference in unit area, then they can be assessed as one typology. This means that similar apartments with similar area can be grouped. For example, an 80 sq.m. and an 87 sq.m. apartment can be assessed as one typology as the difference in area between the two is less than 10%.
Page 15, GREEN MEASURES GUIDANCE, Results	The KPIs include: ... * <i>* two new KPIs added to the Homes tool</i>	The KPIs include: • Incremental Cost - Additional cost of implementing the selected efficiency measures. (in USD or local currency in specific countries). Certain building measures may contribute to a lower overall cost compared to the baseline. Therefore, negative incremental costs are possible. EDGE cost data is based on average global data and is continuously being refined. It is only meant as a guidance tool for comparison between measures. If specific local data is available, the use of it in a more specific financial model is encouraged for making financial decisions. • Payback in Years – Number of years to repay the incremental cost compared to the cost saving of utilities. The method used is simple payback based on the capital cost of the measure.

HOMES User Guide

Page 43,
HME09 – NATURAL
VENTILATION,
Potential
Technologies/Strategies,
Table 18

Table 18 ... The area of opening can be calculated following room types and then multiplying the total area of the room by the percentage indicated.

Table 18 ... The area of opening can be calculated following room types and then multiplying the total area of the room by the percentage indicated. **This measure does not apply to bathrooms.**

HOTELS User Guide

Location

INTRODUCTION,
About EDGE

ORIGINAL

This guide is specifically for ~~new~~ **hotels and resorts** design and construction

ADDENDUM

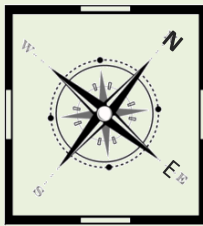
This guide is specifically for **hotels and resorts**. **EDGE can be used to certify hotels and resorts at any stage of their life cycle. This includes new construction, existing buildings, and major renovations.**

Page 91
HTW03* – DUAL FLUSH
FOR WATER CLOSETS IN
GUEST ROOMS,
And
Page 95
HTW06* – DUAL FLUSH
FOR WATER CLOSETS IN
ALL OTHER BATHROOMS

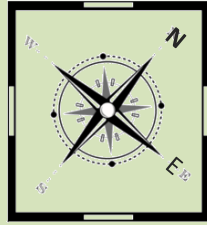
If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance.

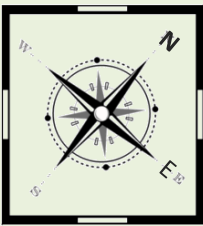
If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance.
In the case of a more efficient single flush system, the same flush value should be entered in the fields for the volume of the first and second flush. Say, the value is 4 lt/flush, then 4 should be entered in both fields.

Approach/Methodologies

RETAIL User Guide		
Location	ORIGINAL	ADDENDUM
INTRODUCTION, About EDGE	This guide is specifically for new retail stores design and construction	This guide is specifically for retail buildings including department stores, shopping malls, supermarkets, small food retail, big box retail, light industry and warehouse. EDGE can be used to certify retail buildings at any stage of their life cycle. This includes new construction, existing buildings, and major renovations.
DESIGN PAGE GUIDANCE, Building Orientation	Main Orientation – Select the building's longest façade from the drop-down menu.	Main Orientation – Select the direction that the building's longest façade faces from the drop-down menu.
DESIGN PAGE GUIDANCE, Building Orientation	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here. The direction of any façade is the direction that its windows would face to the outside when seen from top; in other words, if a line is drawn perpendicular to the length of the wall with the arrow pointing to the outside in plan view, it's the direction the arrow is pointing to. For example, a wall whose windows look out to the north-east has a north-east orientation.  This wall has a North-East orientation
Page 79 RTW01* – DUAL FLUSH FOR WATER CLOSETS, Approach/Methodologies	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance.	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance. In the case of a more efficient single flush system, the same flush value should be entered in the fields for the volume of the first and second flush. Say, the value is 4 lt/flush, then 4 should be entered in both fields.
Energy Measure, RTE 29		<i>Please see the Appendix of this supplement for a description of the new measure RTE28</i>

OFFICES User Guide

Location	ORIGINAL	ADDENDUM
INTRODUCTION, About EDGE	This guide is specifically for new office building design and construction.	This guide is specifically for office buildings . EDGE can be used to certify office buildings at any stage of their life cycle. This includes new construction, existing buildings, and major renovations.
DESIGN PAGE GUIDANCE, Building Data	Cellular Office – Select if the building does not have an open plan system and employees work in separate rooms.	Cellular Office – Select if the building does not have an open plan system and employees work in separate enclosed rooms with floor-to-ceiling partitions and doors.
DESIGN PAGE GUIDANCE, Building Orientation	Main Orientation – Select the building's longest façade from the drop-down menu.	Main Orientation – Select the direction that the building's longest façade faces from the drop-down menu.
DESIGN PAGE GUIDANCE, Building Orientation	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here. The direction of any façade is the direction that its windows would face to the outside when seen from top; in other words, if a line is drawn perpendicular to the length of the wall with the arrow pointing to the outside in plan view, it's the direction the arrow is pointing to. For example, a wall whose windows look out to the north-east has a north-east orientation. 
Page 86 OFW02* – DUAL FLUSH FOR WATER CLOSETS IN BATHROOMS, Approach/Methodologies	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance.	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance. In the case of a more efficient single flush system, the same flush value should be entered in the fields for the volume of the first and second flush. Say, the value is 4 lt/flush, then 4 should be entered in both fields.

HOSPITALS User Guide		
Location	ORIGINAL	ADDENDUM
INTRODUCTION, About EDGE	This guide is specifically for the design and construction of new hospitals.	This guide is specifically for the design and construction of hospitals . EDGE can be used to certify hospitals at any stage of their life cycle. This includes new construction, existing buildings, and major renovations.
DESIGN PAGE GUIDANCE, Building Orientation	Main Orientation – Select the building's longest façade from the drop-down menu.	Main Orientation – Select the direction that the building's longest façade faces from the drop-down menu.
DESIGN PAGE GUIDANCE, Building Orientation	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here.	Building lengths- ... e.g. if there are three north facing exterior wall segments, they should be added up before entering here. The direction of any façade is the direction that its windows would face to the outside when seen from top; in other words, if a line is drawn perpendicular to the length of the wall with the arrow pointing to the outside in plan view, it's the direction the arrow is pointing to. For example, a wall whose windows look out to the north-east has a north-east orientation.  This wall has a North-East orientation
Page 105 HSW03* – DUAL FLUSH FOR WATER CLOSETS IN ALL BATHROOMS, Approach/Methodologies	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance.	If the flush volume is lower than 6 liters for the first flush and/or 3 liters for the second flush, then the default value should be replaced with the actual values in order to recognize the even greater performance. In the case of a more efficient single flush system, the same flush value should be entered in the fields for the volume of the first and second flush. Say, the value is 4 lt/flush, then 4 should be entered in both fields.

3. WHAT'S NEW

Scope of EDGE Expanded Beyond New Construction

EDGE can now be used to certify buildings at any stage of their life cycle. New construction, existing buildings, and buildings undergoing a renovation will all be eligible. Determining whether a project has enough compliance documentation to apply for EDGE will be the responsibility of the project team. Only projects that have requisite supporting documentation can be certified.

The EDGE platform will remain essentially the same. EDGE continues to be an asset rating system for buildings at all stages of their life cycle, and therefore, operational information will not be required. As is the case with the certification of new design, EDGE for buildings that are existing or undergoing renovation will attest to the building's features, not its performance.

The EDGE standard remains the same for all buildings irrespective of the stage of their life cycle, and the same base case conditions apply. The only exception is that materials greater than five years old will be considered as embodied-energy neutral, which can be indicated as "re-use of existing materials" within the EDGE App.

The EDGE App will remain essentially the same. A new field will be added to the EDGE App to indicate the "year of completion" of the building, which will appear only at the post-construction stage for projects.

There is no design stage review for existing buildings, as only post-construction is applicable. However, buildings undergoing major renovations (>25% of major elements) must apply for a design stage review.

In the absence of purchase receipts, proof of installation can be provided using photographs or other evidence. EDGE is primarily interested in ensuring that a measure has indeed been installed. A common-sense approach is advised to provide evidence for measures on a case-by-case basis. If a measure cannot be verified, for example insulation installed inside a wall that is not visible, then that measure cannot be claimed.

ZERO NET CARBON GOAL TRACKING FOR ARCH2030

The EDGE App now reports carbon savings in addition to Energy savings. EDGE can be used to track Zero Net Carbon or ZNC goals by projects participating in the Architecture 2030 Challenge, which calls for all new buildings, developments, and major renovations to be carbon-neutral (Zero Net Carbon or ZNC) by 2030. The two measures associated with this appear on the Energy tab and are described below. They only get activated once the minimum savings of 40% required by Architecture 2030 have been achieved.

HME23, HTE33, RTE30, OFE32, HSE38

– OFFSITE RENEWABLE ENERGY PROCUREMENT

Requirement Summary

This measure can be claimed if a contract has been signed for the procurement of new off-site renewable energy that is specifically allocated to the building project. Renewable energy includes any carbon-free energy that is generated without the use of fossil fuels, such as that sourced from solar, wind, tidal, or biomass resources.

Intention

Investment in off-site renewable energy supports the creation of new clean energy resources on the electrical grid. This allows projects to access renewable energy even if they are located in a dense urban environment and do not have sufficient open space or solar access to generate energy on site. Supporting off-site renewable energy can accelerate the reduction of greenhouse gas emissions associated with the energy sector. Additionally, by increasing renewable energy capacity on the grid, these resources may become more accessible or affordable for a greater number of electricity consumers.

Approach/Methodologies

In order to claim this measure, the design team must specify the quantity of off-site renewable energy that was contractually procured for the building project. If an entity associated with the project has already made general procurements of off-site renewable energy at an organization level, it must be demonstrated that a specific allocation was made for the exclusive use of the building. Off-site renewable energy procurements are typically transacted in blocks of energy units over the course of a year, such as kilowatt hours or equivalent BTU of electricity. When off-site renewable energy procurements are entered into the EDGE app, the quantity is compared to the annual electricity use to give a percentage offset.

Potential Technologies/Strategies

Off-site renewable energy may be procured from a variety of sources that are typically regionally dependent. In some countries, utility providers have established formal programs to support renewable energy development through a premium rate that is charged directly to the consumer's electricity bill, known as "green power" purchasing. Alternatively, third-party providers may have established individual projects or other community-based cooperatives to allow collective procurement of renewable energy at the local level. Where regional renewable energy resources do not exist, projects may also consider procurement of renewable energy certificates (RECs) or other transferrable credits that can be sourced from a broader range of locations. These credits essentially transfer the value of renewable energy generated from the system owner to a consumer on the open market.

Project teams should refer to their local jurisdiction or regulatory authority for a definition of acceptable forms of renewable energy. In general, the EDGE tool will not accept forms of renewable energy that involve the combustion of fossil fuels or other non-renewable carbon-based resources.

Relationship to Other Measures

Off-site renewable energy procurements may be made in combination with other measures that reduce the use of fossil fuel or carbon-based energy resources for building construction and operations. These may include energy efficiency measures that improve the passive performance of a building, such as increased insulation or higher efficiency glass; the reduction of fossil fuel energy use in active systems, such as through high efficiency equipment; or the replacement of fossil-fuel based electricity from the grid with on-site generated renewable energy. The ultimate goal of combining these energy use reduction and replacement measures would be to utilize renewable energy for all energy demands on site.

Assumptions

The base case assumes that no off-site renewable energy procurements have been made for the project.

Compliance Guidance

The design team must be able to provide documentation of the origin and type of off-site renewable energy procurements, including the name of the provider. This documentation should include a copy of a signed contract or other formal agreement to confirm allocation of the off-site renewable energy. Note: off-site renewable energy procurements must be associated with new projects that are retired from the market after the energy is procured.

Design Stage	Post-Construction Stage
No documentation is required at the design stage.	At the post-construction stage the following must be used to demonstrate compliance: • Copy of contract or other formal document stating the quantity and term of renewable energy provided to the project • Description of the form of renewable energy that is procured and its origin or project name • Documentation that it meets the definition of an applicable local authority

HME24, HTE34, RTE31, OFE33, HSE39

– CARBON OFFSET

Requirement Summary

This measure can be claimed if a contract has been signed for investment in a carbon offset project. Carbon offsets represent funding for third-party action to reduce or recapture carbon emissions that would otherwise be emitted to the atmosphere.

Intention

Investing in carbon offsets reduces the net impact of building construction and operations to the atmosphere. By putting a value on carbon emissions reduction, the market is incentivized to implement additional measures to mitigate carbon emissions impact.

Approach/Methodologies

In order to claim this measure, the design team must specify the amount of carbon offsets that have been procured with a signed contract. Typically, each carbon offset unit represents the mitigation of one metric tonne of carbon dioxide or equivalent greenhouse gas. When carbon offsets are claimed in the EDGE app, the offset value is compared to the total estimated carbon emissions of the improved case in order to calculate the total offset percentage.

Potential Technologies/Strategies

Many different carbon offset products are available from providers that represent projects across a range of sectors and regions. While the most common carbon offset projects are related to funding new renewable energy installations, such as solar or wind energy, a number of other projects are available related to energy efficiency upgrades, methane or carbon capture and sequestration and forestry restoration. The EDGE tool does not make restrictions on the type or origin of carbon offsets, though project teams may choose to procure specific offset products based on their desired impact (e.g. support clean energy development) or a preference for locally-based projects. While the EDGE tool recognizes carbon offsets equally based on the equivalent metric tonnes of CO₂, the cost of individual carbon offsets may vary depending on regional availability and project type.

Relationship to Other Measures

Carbon offsets may be applied in combination with other measures that reduce the emissions associated with building construction and operations. These may include energy efficiency measures that improve the passive performance of a building, such as increased insulation or higher efficiency glass; the reduction of fossil fuel energy use in active systems, such as through high efficiency equipment; or the replacement of fossil-fuel based electricity from the grid with on-site generated or off-site procured renewable energy. Together, carbon reduction measures can be combined with carbon offsets to achieve a zero net carbon balance for the building.

Assumptions

The base case assumes that no carbon offsets have been procured for the project.

Compliance Guidance

The design team must be able to provide documentation of the origin and type of carbon offset procured, the organization issuing the offset, and evidence of third-party verification by the appropriate regulatory authority. Finally, a copy of a signed contract must be provided in order to confirm execution of the carbon offsets. Note: carbon offsets must be new projects that are retired after the offset is issued. Also, EDGE does not recognize carbon offsets that are based on materials combustion.

Design Stage	Post-Construction Stage
No documentation is required at the design stage.	At the post-construction stage the following must be used to demonstrate compliance: • Documentation of the carbon offset provider, stating formal certification or other third party verification by an appropriate authority • Description of carbon offset project, including the methods by which carbon reductions are made • Copy of contract or other formal document stating the amount of offsets procured in equivalent metric tonnes of CO₂

'RE-USE' OPTION FOR MATERIALS

The option to re-use a material for construction is available in all building types. The re-use of an existing material is possible for all material types in EDGE except insulation.

APPENDIX 2: DETAILED LIST OF MATERIALS

HTM01 – FLOOR SLABS

1.16 - Re-Use of Existing Floorslab



Description

Re-using an existing material avoids the use of new materials and any embodied energy associated with them. The re-use of existing materials option in EDGE is highly desirable and assigned an embodied energy value of zero (0).

Components:

Re-use of existing floorslab

Embodied energy at default thickness

0 MJ/m²

HTM02 – ROOF CONSTRUCTION

2.28 - Re-Use of Existing Roof

Same properties as above

HTM03 – EXTERNAL WALLS

3.42 - Re-Use of Existing Wall

Same properties as above

HTM04 – INTERNAL WALLS

3.78 - Re-Use of Existing Wall

Same properties as above

HTM05 – FLOORING

4.13 - Re-Use of Existing Flooring

Same properties as above

HTM06 – WINDOW FRAMES

6.06 – Re-use of Existing Window Frames

Same properties as above

HTM07 - GLAZING

7.04 – Re-use of Existing Glazing

Same properties as above

'OTHER RENEWABLE ENERGY' MEASURE

HME22, HTE32, RTE29, OFE31, and HSE37

– OTHER RENEWABLE ENERGY FOR ELECTRICITY GENERATION

Requirement Summary

This measure can be claimed if the project utilizes electricity generated from renewable resources other than solar photovoltaics, such as Biomass, Wind, Geothermal and Hydropower. The renewable energy source must be located on the project site to claim savings. Because the renewable source replaces a proportion of the electricity generated from fossil fuels, renewable sources of electricity are considered an energy efficiency measure.

Intention

The intent of this measure is to reduce the use of electricity generated from fossil fuels such as coal.

Approach/Methodologies

To claim this measure, the design team needs to indicate the proportion of electricity demand that they would offset with renewable energy generated on-site. The total annual electricity consumption of the improved case is generated by the EDGE App. The design team must be able to demonstrate that the renewable electricity source can deliver the percentage of electricity consumption claimed by the project.

The renewable electricity source may be centralized for a combination of buildings / dwellings within the development. In these cases, the total should be calculated for the master project and the same average percentage should be used uniformly in all the models for the project.

Potential Technologies/Strategies

Several systems for generating electricity from renewable sources are available at varying levels of efficiency. Efficiency levels of 20% or more can be achieved by some commercially available systems, but others are only capable of delivering as little as 5% efficiency. Design teams should therefore ensure that the specified system achieves the maximum efficiency possible for the available capital.

Relationship to Other Measures

To maximize the percentage contribution from the renewable source of electricity, the electricity demand should first be minimized by reducing energy consumption (such as, by using natural instead of mechanical ventilation, or by using automatic lighting controls).

Assumptions

The base case assumes that no renewable source of electricity generation is being utilized. The improved case defaults to zero (0) renewable energy production. A user must select the appropriate source of renewable energy and assign to it the percentage of annual electricity consumption met by the source.

Compliance Guidance

To demonstrate compliance, the design team must briefly describe the system. The EDGE App will display the annual electricity demand of the improved case in kWh. The percentage of this demand met by the renewable energy system can be claimed by the design team.

Design Stage	Post-Construction Stage
At the design stage, the following must be used to demonstrate compliance: • Supporting calculation showing the proposed system will deliver sufficient electricity to achieve the claimed proportion of total demand, and • Manufacturer's data sheets for the proposed system, or • Engineering drawings showing the system size and location	At the post-construction stage, the following must be used to demonstrate compliance: • As-built documentation showing the location and size of the system • Photographs of the system • Purchase receipts and delivery notes of the system

'SKYLIGHT(S)' MEASURE (RETAIL BUILDINGS)

RTE28 – SKYLIGHT(S) TO PROVIDE DAYLIGHT TO 50% OF TOP FLOOR AREA

Requirement Summary

This measure can be claimed if the top floor of a building utilizes natural daylight from skylights to light up the top floor of the interior, reducing the use of artificial lighting during daytime hours.

Intention

The intent of this measure is to reduce the use of electricity for artificial lighting by using natural daylight. The use of daylight for lighting interior spaces requires only a part of the roof to be transparent, and can save significant amounts of electricity usage for lighting, especially in spaces that are used mostly in the daytime.

Approach/Methodologies

The skylights should be well distributed to provide maximum daylight penetration in the building. The skylight may be horizontal, or vertical (also called roof monitor).

To claim this measure, the design team must demonstrate that transparent elements in the roof allow sufficient daylight to achieve the required lighting level in the interior of the space of the top floor area, and that the lights in this area are equipped with dimming or shut-off controls such as daylight-responsive controls.

The 'Daylight Zone' claimed under each type of skylight must comply with the guidelines accompanied by the figures below.

1. The Daylight Zone of a skylight shall extend in both horizontal directions along the floor beyond the edge of the skylight to the lesser of (i) 0.7 x the ceiling height, or (ii) the nearest obstruction that is 0.7 times the ceiling height or more, as indicated in Figure 1.
 - a. An obstruction *less* than 0.7 x the ceiling height (CH) may be ignored
 - b. An obstruction up to 0.7 x CH in height that is *closer* than 0.7 x (CH minus the obstruction height (OH)) may be ignored¹
2. In the case of multiple skylights, the floor areas under the skylights which are being counted as Daylight Zone areas must not overlap.
3. The lighting in each Daylight Zone area must be controlled with either manual or daylight-responsive controls. Controls or calibration mechanisms shall be readily accessible, and may serve all light fixtures, alternate fixtures or individual fixtures in a zone. Dimmable controls shall be capable of dimming to 15% of light output or lower and be capable of complete shut-off.

Exceptions:

- a. Areas with less than 6.5 Watts/m² of general lighting may not be controlled
- b. Areas designated as security or emergency areas that are required to be continuously lighted
- c. Interior exit stairways, interior exit ramps and exit passageways
- d. Emergency egress lighting that is normally off
- e. Display/accent lighting shall have dedicated controls independent of the general lighting controls

Design Guidance

Sunlight access must not be blocked for > 1500 hours in a year between 8 am and 4 pm.

One method to verify the adequacy of the daylighting system is to calculate the product of the visible transmittance (VT) of the skylight and the area of the skylight (rough opening), divided by the area of the Daylight Zone. The result should be no less than 0.008.

$$VT \times \frac{\text{Area of Skylight}}{\text{Area of Daylight Zone}} \geq 0.008$$

¹ Adapted from: (1) ASHRAE Standard 90.1-2015 and (2) International Energy Conservation Code 2015, Section C405.2 Lighting Controls

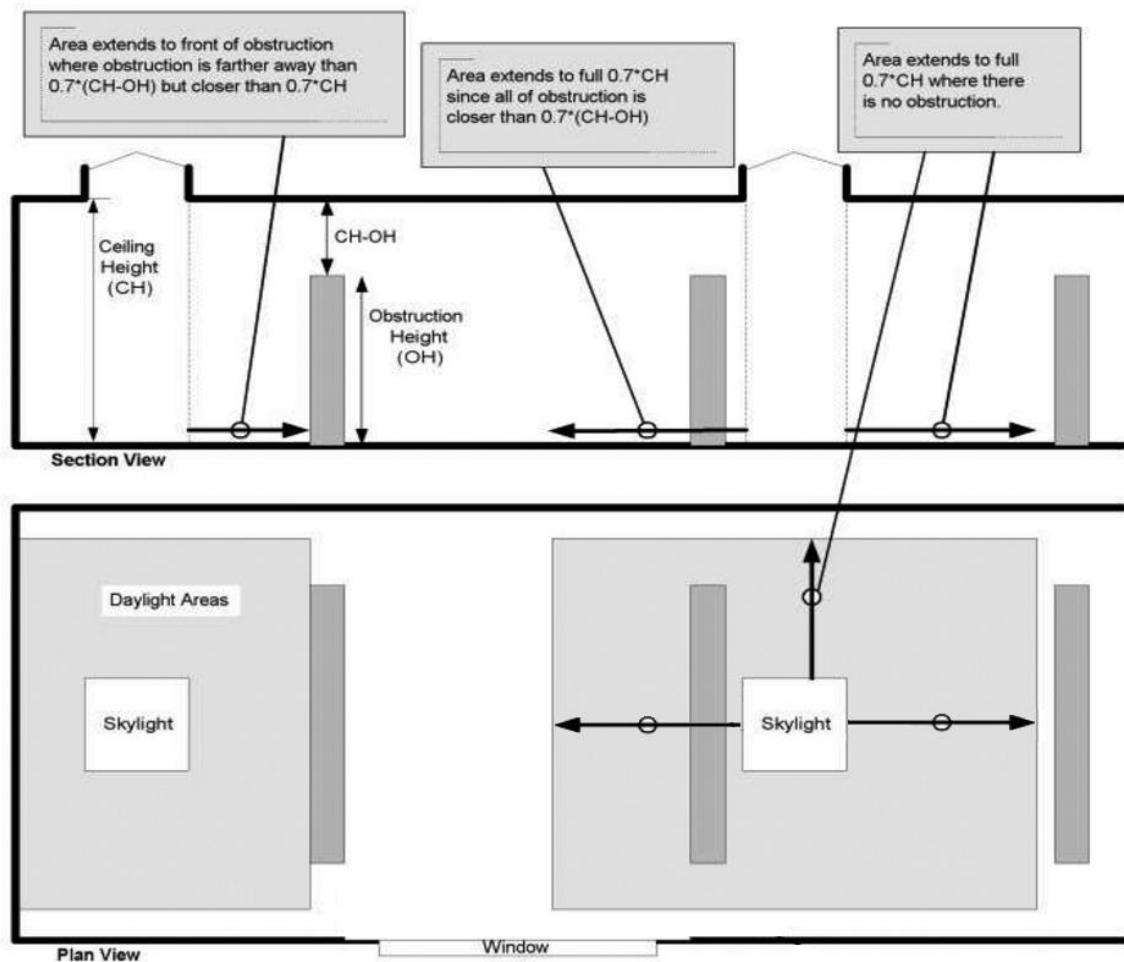
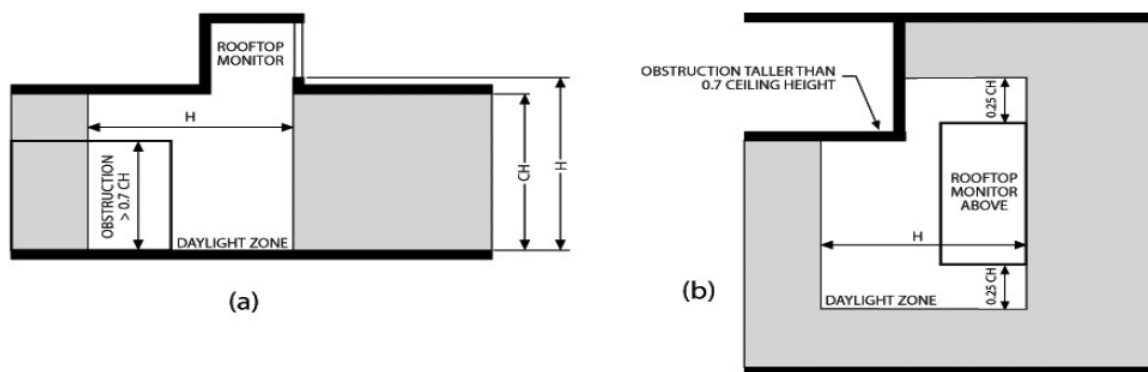
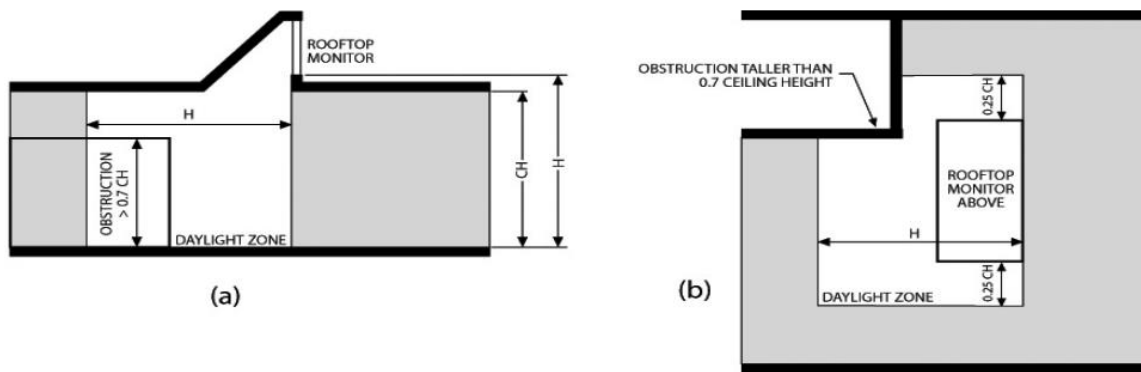


Figure 1. Daylight zone under roof skylights



(a) Section view and (b) Plan view of daylight zone under a rooftop monitor

Figure 2. Daylight zone under a vertical skylight (roof monitor) with a flat top



(a) Section view and (b) Plan view of daylight zone under a rooftop monitor

Figure 3. Daylight zone under a vertical skylight (roof monitor) with a sloping top

Potential Technologies/Strategies

Natural daylight can be introduced into the top floor using windows in the roof, that is, skylights. Glass skylights are typically used, but daylight can also be introduced through other transparent or translucent materials such as translucent insulation panels.

Relationship to Other Measures

The use of skylights will impact the heat gain through a roof which will impact the energy use for space conditioning. The area of skylights, and their thermal properties (the Solar Heat Gain Coefficient or SHGC and the U-value) should be optimized to avoid excessive heat gain. Reduction in electricity usage for artificial lighting by using skylights should be balanced with potential increase in cooling energy use.

Assumptions

The base case assumes no skylights in the building. When this measure is selected, the improved case with skylights assumes that a default area of 50% of the top floor is a Daylight Zone served by skylights, with a default Solar Heat Gain Coefficient (SHGC) of 0.35 and a U-value of 1.7 W/m².K. Selecting the measure also reveals the editable fields for (1) the area of the Daylight Zone (represented as a percentage of the top floor area) labelled as '% Day Lit Area', (2) SHGC of the fenestration and (3) U-value of the fenestration.

Compliance Guidance

In order to demonstrate compliance, the design team must describe the daylighting system and provide documentation to support the claims.

Design Stage	Post-Construction Stage
At the design stage the following must be used to demonstrate compliance: - Buildings plans and sections showing the skylights and obstructions in the daylight zones. - Lighting plans showing the lighting controls in the Daylight Zones.	At the post-construction stage the following must be used to demonstrate compliance: - Photographs of the installed skylights; and - Photographs of the daylit area - As-built documentation of lighting control system

CHINA-SPECIFIC DEVELOPMENTS in EDGE Version 2.1

APPENDIX 1 – COUNTRY SPECIFIC CONSIDERATIONS

China

Green Building Evaluation Label (GBL), also known as the “3-Star” System

EDGE version 2.1 includes the ability to demonstrate compliance with certain categories of the China's Green Building Evaluation Label (GBL), also known as the “3-Star” System. China GBL is a green building certification program administered by the Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD). GBL evaluates projects based on 8 categories: land, energy, water, resource/material efficiency, indoor environmental quality, construction management, operational management, and a bonus category for innovation.

The EDGE software can be used to demonstrate compliance in 4 of the 8 GBL categories for the GBL points listed in the table in this section. Note that not all GBL categories are included in EDGE. The EDGE software includes nearly 30 cities in China. The EDGE baseline for projects located in China follows the GBL system instead of the ASHRAE baseline. EDGE also provides GBL-specific calculators for China projects within the EDGE user interface.

Users can create a project in EDGE with a location in China, select the measures included in their project, and use the GBL calculators to generate inputs for the EDGE App. Users can then generate a GBL report in the EDGE App by going to File > Download GBL Report.

Some features unique to the EDGE user interface for China are:

1. The 'Building Data' section on the Design tab includes a field for the 'Building Shape Coefficient'.

$$\text{Building Shape Coefficient}(C) = \frac{\text{Building Exterior Area}}{\text{Built Volume}}$$

Smaller the Building Shape Coefficient, lesser is the heat loss via the building envelope and lesser the energy consumption.

2. The 'Building Systems' section on the Design tab includes dropdown menus to select system types for AC and heating.
 - The AC system defaults to a DX Split System
 - The Space heating system has four choices
 - i. Fuel Gas Boiler
 - ii. Layered Combustion Boiler
 - iii. Spreader Chain Grate Boiler
 - iv. Fluidized Bed Combustion Boiler
3. There are GBL calculators built into the measures. For example, if 'HME16: Energy-saving Light Bulbs' measure is selected in the Homes tool, a GBL- Lighting Power Density calculator becomes available. There are also additional GBL calculators available at the bottom of the Energy tab. These are:
 - GBL – Lighting Control, and
 - GBL – Openable Window/Façade Ratio

GBL Category	Measure	Total Points Available through EDGE
ENERGY		68
5.1.4 & 5.2.10	Lighting Power Density	8
5.2.1	Window To Wall Ratio	6
5.2.2	Openable Window/Façade Ratio	6
5.2.3	Design Thermal Performance Improvements	10
5.2.4	Equipment Efficiency Improvements	6
5.2.6	HVAC System Energy Saving	10
5.2.9	Lighting Control	5
5.2.13	Energy Recovery from Exhaust Air	3
5.2.15	Waste Heat Recovery	4
5.2.16	Renewable Energy	10
INDOOR ENVIRONMENTAL QUALITY		13
8.2.10	Natural Ventilation	13
WATER		43
6.2.6	Water Fixtures	10
6.2.8	Condenser Water System	10
6.2.10	Non-Traditional Water Utilization (Landscaping, Lavatory, Car Washing & Road Washing)	15
6.2.11	Non-Traditional Water Utilization (Condenser Water Use)	8
EXEMPLARY PERFORMANCE AND INNOVATION		5
11.2.1	Design Thermal Performance Improvements	2
11.2.2	Equipment Efficiency Improvements	1
11.2.4	Water Fixtures	1
11.2.11	Carbon Emission Calculation	1

