

6	IEQ	6.6 LIGHTING QUALITY	
		IEQ 16 INTERIOR LIGHTING IN NORMALLY OCCUPIED AREAS	
	EXCLUSIONS	Residential buildings, hotels and apartment buildings.	
	OBJECTIVE	Ensure the adequacy and maintenance of visual comfort conditions achieved by the electric lighting provisions in occupied spaces.	
	CREDITS ATTAINABLE	1 + 1 BONUS	
	PREREQUISITES	None.	
	CREDIT REQUIREMENT	<p>1 credit where the prescribed lighting performance in each type of premises in respect of illuminance and lighting quality is achieved.</p> <p>It is required to fulfill the following:</p> <ul style="list-style-type: none"> (i) prescribed lighting performance in respect of maintained illuminance and illuminance variation; and (ii) the limiting unified glare rating is achieved and light sources have an appropriate colour rendering index. <p>1 BONUS credit for providing automatic control of artificial lighting such as daylight sensors at perimeter zones and/or occupancy sensors.</p>	
	ASSESSMENT	<p>The design criteria for interior lighting shall be at the discretion of the Client but shall embrace both 'quantity' and 'quality' of the lighting system performance including: maintained horizontal, and where appropriate vertical, illuminance, illuminance variation, limiting glare index, colour rendering, and modulation of light output appropriate to the type and use of the premises/indoor spaces.</p> <p>The criteria adopted shall be based on authoritative guidance, such as that provided in CIE [1,2], CIBSE [3] and/or IESNA [4] publications, or equivalent. As the focus is on lighting for comfort and productivity, lighting for performing arts, display decoration, ambience. etc., will normally be excluded from consideration.</p> <p>Compliance with the assessment criteria shall be demonstrated either by measurements using a standardised measurement protocol appropriate to the parameter being assessed, and/or by modelling (calculation), providing the calculation method or software used is based on a standardised method, and uses data/assumptions appropriate to the circumstances. Notwithstanding, demonstration of compliance with a) requires that the maintained illuminance take into account the influence on light output by adjacent air-conditioning or ventilation fixtures, and the lighting maintenance plan (the period for luminaire cleaning and group re-lamping) appropriate to the circumstances [5].</p> <p>The Client shall submit a report prepared by a suitably qualified person detailing the 'as installed' lighting systems or, for premises/spaces yet to be fitted-out, the technical details of the proposed lighting systems for each type of normally occupied space within the development. The report shall detail the design criteria and the results of measurements or other means of demonstrating compliance. For premises to be fitted out by tenants compliance shall be confirmed if the technical details and contractual arrangements with tenants in respect of lighting installations</p>	<p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p>

- 1 Commission Internationale de l'Eclairage (CIE). Lighting of Indoor Work Places. CIE Standard S 008/E.
- 2 Commission Internationale de l'Eclairage (CIE). Discomfort Glare in Interior Lighting. CIE 117-1995.
- 3 The Chartered Institution of Building Services Engineers. Code for interior lighting. London. CIBSE.
- 4 Illuminating Engineering Society of North America. Lighting Handbook, Reference & Applications. 9th edition., New York.
- 5 Commission Internationale de l'Eclairage (CIE). Maintenance of indoor electric lighting systems. CIE Technical Report - Publication No. 97. Vienna.

are deemed to meet the assessment criteria.

The Client shall submit a report prepared by a suitably qualified person detailing the automatic control of artificial lighting such as daylight sensors in perimeter zones and/or occupancy sensors.

7

MEASURED PERFORMANCE

For lighting installations that are already installed, horizontal and vertical illuminance and luminance can be measured using a lux meter and a luminance meter. The colour quality of lamps can be assessed from the lamp specifications. Colour appearance (correlated colour temperature) can be checked from the lamp labels or by measurement using a colour meter. Flicker can be assessed by whether the specified ballasts are magnetic or electronic, and can be tested using a simple 'flicker meter'.

Air diffusers located near to fluorescent luminaires with open lamp compartments may result in cool air blowing over the lamps directly causing decrease light output and lamp efficacy. The design details should demonstrate that the cool air from diffusers will not adversely impact lamp performance.

COMPUTATION

The 'lumen method' can be used to calculate the maintained illuminance over the working plane according to the calculation procedure described in Section 4.5.3 of the CIBSE Code or in Appendix 3 of the CIBSE Lighting Guide [6]. The calculated maintained illuminance will then be checked for compliance with the recommendations given in Section 2.6.4 of the Code, or the recommendations given in Chapter 5 of the Guide.

The illuminance variation consists of 'uniformity' which is concerned with illuminance conditions on the task and immediate surroundings, and 'diversity' which expresses changes in illuminance across a larger space. The uniformity and diversity can be calculated according to that described in Section 4.5.4 of the Code. The calculated uniformity (minimum to average illuminance) over any task area and immediate surround should not be less than 0.8. The diversity of illuminance expressed as the ratio of the maximum illuminance to the minimum illuminance at any point in the 'core area' of the interior should not exceed 5:1. The core area is that area of the working plane having a boundary 0.5 m from the walls.

The glare index can be calculated according to either of the two methods described by CIE [2], or the CIBSE Technical Memoranda [7]. These methods are also summarised in Section 4.5.6 of the CIBSE Code [3]. The calculated glare index shall be checked for compliance with the recommendations given in Section 2.6.4 of the Code or Chapter 5 of the Lighting Guide.

For assessment using the IESNA Lighting Criteria, the calculation methods described in Chapter 9 of the IESNA Lighting Handbook can be used for the calculation of the following parameters:

- horizontal and vertical illuminance;
- glare: VCP or UGR; and
- luminance.

Alternatively, a validated computer program such as RADIANCE, LIGHTSCAPE etc can be used for the calculation. The calculated results will then be checked for compliance with the recommended criteria in the IESNA Lighting Design Guide.

6 The Chartered Institution of Building Services Engineers. Lighting Guide LG7: Lighting for offices. London, CIBSE, 1993.
7 The Chartered Institution of Building Services Engineers. Technical Memoranda TM10. Calculation of glare indices. London, CIBSE, 1985.



Circular Letter No.: 2020.168 (Revision 1)

Issue Date: 5 June 2020

Revision Date: 28 January 2022

Application: BEAM Plus NB Version 1.1 and 1.2

Effective Date: 28 January 2022

Updated Exclusion Clauses for IEQ Credits

1. **Technical Circular Letter No. 2016.134 dated 09 August 2016 will be withdrawn on the effective date.**
2. This Circular Letter clarifies the exclusion clause for the following credits:

Credits	New Exclusions
IEQ P1 IEQ 9	Residential premises, or Premises designed to utilise natural ventilation and without any fresh air provision ¹ .
IEQ 3	Residential premises, or Premises without any provision of air-conditioning equipment.
IEQ 5	Residential premises, or Premises without HVAC system.
IEQ 6	Residential premises, or Premises without any fresh air provision ¹ .
IEQ 7a IEQ 7b	Residential premises without any interior decoration, or Premises without any fresh air provision ¹ and interior decoration.
IEQ 10	Premises with fresh air provision ¹ .
IEQ 11b	Residential premises, or Premises without any future tenant (for example, single owner occupier premises).
IEQ 12	Premises without any enclosed common area in the main circulation route.
IEQ 13a	Normally occupied premises ² without any air-conditioning equipment installed and provided by the project proponent, or without any fresh air provision ¹ .
IEQ 13b	Normally occupied premises ² without any installation of air diffuser in the air-conditioning system.

¹ Fresh air provision means any fresh air equipment such as PAU, AHU, FAU, FAP, FAF, etc.; and/or premises with fresh air louvers, etc.

² Normally occupied premises are enclosed spaces / areas where people normally stay there for more than 1 hour per person per day on average.

Credits	New Exclusions
IEQ 14a	Normally occupied premises ² with fresh air provision ¹ .
IEQ 14b	Normally occupied premises ² with fresh air provision ¹ , or without any air-conditioning equipment installed and provided by the project proponent.
IEQ 16	Residential premises, hotels, apartment and premises where lighting installation will be provided by future tenant such as Retail and F&B ³ .
IEQ 21	Not normally occupied premises ² .

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Ir SK Ho
Chairperson of Standards Sub-committee

³ The clause “For premises to be fitted out by tenants, compliance shall be confirmed if the technical details and contractual arrangements with tenants in respect of lighting installation are deemed to meet the assessment criteria.” in BEAM Plus Manual IEQ 16 becomes not applicable.



Circular Letter No.: 2014.119

Issue Date: 23 June 2014

Application: BEAM Plus NB Version 1.1
BEAM Plus NB Version 1.2

Effective Date: 23 June 2014

Credits Not Applicable to Not Normally Occupied Buildings

This circular letter announces that the following credits are not applicable to buildings that are not normally occupied (e.g. pump stations, sewerage treatment plants).

8

- SA 2
- SA 3
- IEQ 10
- IEQ 15
- IEQ 16
- IEQ 21
- IEQ 23a

Signed :

A handwritten signature in blue ink, appearing to read "Ray", is written over a horizontal line.

Dr. Raymond Yau
Chairperson of Technical Review Committee

EU 1 Reduction of CO2 Emissions

EU 1 - Option 2 Alternative Route: Passive Design

EU 2 Peak electricity demand reduction

EU 3 Embodied energy in building structural elements

EU 6 Renewable Energy System

EU 7 Air-conditioning units

EU 9 Energy efficient appliances

EU 10 Testing and Commissioning

EU 11 Operation and Maintenance

EU 12 Metering and monitoring

Water Use

WU P1 Water Quality Survey

WU P2 Minimum water saving performance

WU 1 Annual water use

WU 3 Water Efficient Irrigation

WU 5 Water efficient appliances

Indoor Environmental Quality

IEQ P1 Minimum ventilation performance

IEQ 1 Security

IEQ 2 Plumbing and Drainage

IEQ 4 Waste Disposal Facilities

IEQ 5 Construction IAQ Management

IEQ 6 Outdoor Sources of Air Pollution

IEQ 7 Indoor Sources of Air Pollution

IEQ 9 Increased ventilation

IEQ 10 Background Ventilation

IEQ 11 Localised Ventilation

IEQ 12 Ventilation in Common Areas

IEQ 14 Thermal Comfort in Naturally Ventilated Premises

IEQ 15 Natural Lighting

IEQ 16 Interior Lighting in Normally Occupied Areas

#105. IEQ 16&17, For BEAM Plus New Buildings Version 1.1 and 1.2, how should the representative sampling points be selected and what is the percentage of compliance of the sampling points in order to achieve the credit?

The sampling point should represent each type of premises with a typical lighting layout. To achieve the credit, 100% compliance of all the representative sampling points is required.

(Released on 29 November 2019)

#106. IEQ 16&17, For BEAM Plus New Buildings Version 1.1 and 1.2, should decorative lighting be assessed?

No. Decorative lighting as defined under Schedule 2 of Buildings Energy Efficiency Ordinance (BEEO) should be excluded from the assessment of IEQ 16 & 17. However, the Applicant should provide clear delineation such as layout drawings and lighting fitting schedule highlighting the portion where decorative lightings are installed in the development.

(Released on 29 November 2019)

#151. IEQ 15, IEQ16 and IEQ 17, For BEAM Plus New Buildings Version 1.1 and 1.2, what documentation is required to substantiate the values of reflectance used in the computations/ modelling?

The Applicants can opt to adopt the following typical reflectance values in the computer modelling, or propose the reflectance values that are specific to their projects.

Surfaces	Typical Reflectance
Ceiling	0.8
Walls	0.5
Floor	0.2

In case the adopted reflectance values exceed the typical reflectance values, the Applicant shall provide the corresponding international standards or supporting documents such as finishing schedule, catalogue, on-site photos, etc. to support the assumption of reflectance.

(Released on 28 January 2022)

IEQ 17 Interior Lighting in Areas not Normally Occupied

IEQ 18 Room Acoustics

IEQ 19 Noise Isolation

IEQ 20 Background Noise

IEQ 21 Indoor Vibration

IEQ 22 Access for Persons with Disability

IEQ 23 Amenity Features