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## Compliance Document for New Zealand Building Code Clause G8 Artificial Light

Prepared by the Department of Building and Housing

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Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Compliance Documents and explains alternative methods of achieving compliance.

Defined words (italicised in the text) and classified uses are explained in Clauses A1 of the Building Code and in the Definitions at the start of this Compliance Document.

| <b>G8: Document History</b>   |             |   |
|---|-------------|---|
|   | <b>Date</b> | <b>Alterations</b>                                  |
| First published   | July 1992   |   |
| Amendment 1   | 1 July 2001 | p. 2, Document History, Status<br>p. 9, Definitions |
| <b>Note:</b> Page numbers relate to the document at the time of Amendment and may not match page numbers in current document. |             |   |

### Document Status

The most recent version of this document, as detailed in the Document History, is approved by the Chief Executive of the Department of Building and Housing. It is effective from 1 July 2001 and supersedes all previous versions of this document.

People using this Compliance Document should check for amendments on a regular basis. The Department of Building and Housing may amend any part of any Compliance Document at any time. Up-to-date versions of Compliance Documents are available from [www.dbh.govt.nz](http://www.dbh.govt.nz)

# New Zealand Building Code

## Clause G8 Artificial Light

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This Clause has been extracted from the New Zealand Building Code contained in the First Schedule of the Building Regulations 1992.

|  |                                  |    |
|--|----------------------------------|----|
| 1992/150   | <i>Building Regulations 1992</i> | 65 |
| <b>FIRST SCHEDULE—continued</b>  |                                  |    |
| <b>Clause G8—ARTIFICIAL LIGHT</b>  |                                  |    |
| <b>Provisions</b>  | <b>Limits on application</b>     |    |
| <b>OBJECTIVE</b>   |                                  |    |
| <b>G8.1</b> The objective of this provision is to safeguard people from injury due to lack of <i>adequate</i> lighting.  |                                  |    |
| <b>FUNCTIONAL REQUIREMENT</b>  |                                  |    |
| <b>G8.2</b> Spaces within <i>buildings</i> used by people, shall be provided with <i>adequate</i> artificial lighting which, when activated in the absence of sufficient natural light, will enable safe movement. |                                  |    |
| Requirement G8.2 shall apply to:   |                                  |    |
| (a) All <i>exitways</i> in <i>Multi-unit Dwellings, Group Dwellings and Communal Residential, Communal Non-residential, Commercial and Industrial buildings,</i>   |                                  |    |
| (b) All <i>access routes</i> except those in <i>Outbuildings and Ancillary buildings,</i> and  |                                  |    |
| (c) All common spaces within <i>Multi-unit Dwellings, Group Dwellings, and Communal Residential and Communal Non-residential buildings.</i>  |                                  |    |
| <b>PERFORMANCE</b>   |                                  |    |
| <b>G8.3</b> <i>Illuminance</i> at floor level shall be no less than 20 lux.  |                                  |    |
| Performance G8.3 shall not apply in emergencies, for which <i>Illuminance</i> requirements are given in Clause F6 "Lighting for Emergency".  |                                  |    |

# Contents

|                                   | <b>Page</b> |
|-----------------------------------|-------------|
| <b>References</b>                 | <b>7</b>    |
| <b>Definitions</b>                | <b>9</b>    |
| <b>Verification Method G8/VM1</b> | <b>11</b>   |
| <b>1.0 Illuminance</b>            | <b>11</b>   |
| <b>Acceptable Solution G8/AS1</b> | <b>13</b>   |
| <b>1.0 Illuminance</b>            | <b>13</b>   |
| <b>Index</b>                      | <b>15</b>   |

# References

For the purposes of New Zealand Building Code compliance, referenced documents shall be deemed to include any amendments issued prior to the date of the Approved Document as displayed at the foot of the page on which the references are listed.

## **Standards Association of New Zealand**

NZS 6703: 1984 Code of practice for interior lighting design

### **Where quoted**

VM1 1.0.1

# Definitions

This is an abbreviated list of definitions for words or terms particularly relevant to this Approved Document. The definitions for any other italicised words may be found in the New Zealand Building Code Handbook.

Amend 1  
Jul 2001

**Illuminance** The luminous flux falling onto a unit area of surface.

Amend 1  
Jul 2001

**Reflectance** The ratio of the flux reflected from a surface to the flux incident on it.

# Verification Method G8/VM1

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## 1.0 Illuminance

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**1.0.1** An acceptable verification method for the measurement of *illuminance* is contained in NZS 6703 Section 11.

**1.0.2** Measurements shall be made on the horizontal plane at floor level. The measurements shall be made in areas unobstructed by objects likely to affect the reading. Obstructions, such as furniture shall be removed.

**1.0.3** Measurements shall not be made within 500 mm of vertical surfaces. Minimum *illuminances* will generally occur furthest from the luminaire(s) and at least four measurements shall be made around each luminaire on two horizontal axes at right angles. If the layout of luminaires is symmetrical or the room is small and it is physically impossible to take the above measurements, the number of measurements may be reduced.

**COMMENT:**

The measurement of the minimum *illuminance* is necessary to check New Zealand Building Code compliance, or to reveal the need for maintenance or replacement in an existing installation.

**1.0.4** Daylight or spill light from adjacent rooms shall be excluded, and lamps switched on and allowed to stabilize. In the case of fluorescent or discharge lighting this will be not less than 20 minutes.

**1.0.5** Because accurate measurement is difficult, an installation shall be deemed to comply with the New Zealand Building Code, if the measured *illuminance* is no less than 18 lux.

# Acceptable Solution G8/AS1

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## 1.0 Illuminance

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**1.0.1** To provide a minimum *illuminance* of 20 lux, the total wattage required per m<sup>2</sup> of floor area is shown in Table 1.

**1.0.2** As there can be wide variations in room dimensions, *reflectances* resulting from interior decoration, and floor coverings, rooms differing substantially from the examples given below, may require specific calculations.

### COMMENT

Downlights and other luminaires with concentrated or narrow beam distribution, require particular care with spacing, if minimum *illuminance* criteria are to be met.

**1.0.3** Refer to NZBC D1 "Access Routes", for stair tread visibility and minimum *illuminance* requirements.



**Table 1: Lighting in Common Spaces Wattage Requirement (W/m<sup>2</sup>)**  
Paragraph 1.0.1

| Luminaire type   | Space category        |                                       |                                   |
|--|-----------------------|---------------------------------------|-----------------------------------|
|  | Corridors<br>(note 3) | Stair and lift<br>lobbies<br>(note 4) | Places of<br>assembly<br>(note 5) |
| Incandescent (plastic shade)   | 12                    | 10                                    | 6                                 |
| Incandescent (general diffusing enclosure)                               | 15                    | 12                                    | 8                                 |
| Fluorescent 36 W cool white<br>(enclosed diffusing fitting)              | 7                     | 4                                     | 2                                 |
| Fluorescent compact single-ended<br>11-16 W (enclosed diffusing fitting) | 8                     | 5                                     | –                                 |
| Discharge 50 W high pressure sodium<br>(enclosed diffusing fitting)      | 5                     | 5                                     | –                                 |
| Incandescent reflector type downlights<br>(120 W PAR 38 flood)           | –                     | –                                     | 6                                 |
| Mercury vapour downlight<br>(80 W coated lamp)                           | –                     | –                                     | 2                                 |

**Note:**

- The figures given are measurements from site tests and the wattages include the power required for control gear where it is part of the installation. Gaps in the table indicate the unavailability of a specific installation for testing.
- The figures (W/m<sup>2</sup>) are not suitable for situations where narrow beam downlights, or small numbers of high power luminaires are used.
- Data is based on a corridor 3.0 m wide and longer than 15 m, with ceiling mounted luminaires 3.0 m above floor level.

Reflectances:

|         |     |
|---------|-----|
| Ceiling | 0.7 |
| Walls   | 0.5 |
| Floors  | 0.1 |

- Data is based on a lobby area 7.0 m by 4.0 m with ceiling mounted luminaires 3.0 m above floor level.

Reflectances:

|          |     |
|----------|-----|
| Ceilings | 0.7 |
| Walls    | 0.5 |
| Floors   | 0.2 |

- Data is based on an auditorium 16 m by 21 m with a ceiling height on 5.0 m.

Reflectances:

|         |     |
|---------|-----|
| Ceiling | 0.7 |
| Walls   | 0.5 |
| Floor   | 0.2 |

# Index G8/VM1 & AS1

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All references to Verification Methods and Acceptable Solutions are preceded by **VM** or **AS** respectively.

|                                    |                                |
|------------------------------------|--------------------------------|
| <b>Illuminance</b> .....           | <b>VM1</b> 1.0, <b>AS1</b> 1.0 |
| measurement .....                  | <b>VM1</b> 1.0.1               |
| minimum .....                      | <b>AS1</b> 1.0.3               |
| <b>Star tread visibility</b> ..... | <b>AS1</b> 1.0.3               |
| <b>Wattage required</b> .....      | <b>AS1</b> 1.0.1               |

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