

Part J6 Artificial lighting and power

Deemed-to-Satisfy Provisions

J6.0 Deemed-to-Satisfy Provisions

- (a) Where a *Deemed-to-Satisfy Solution* is proposed, *Performance Requirement JP1* is satisfied by complying with—
- (i) J0.1 to J0.5; and
 - (ii) J1.1 to J1.6; and
 - (iii) J3.1 to J3.7; and
 - (iv) J5.1 to J5.12; and
 - (v) J6.1 to J6.8; and
 - (vi) J7.1 to J7.4; and
 - (vii) J8.1 to J8.3.
- (b) Where a *Performance Solution* is proposed, the relevant *Performance Requirements* must be determined in accordance with A2.2(3) and A2.4(3) as applicable.

J6.1 Application of Part

J6.2, J6.3 and J6.5(a)(ii) do not apply to a Class 8 *electricity network substation*.

J6.2 Artificial lighting

- (a) In a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building—
- (i) the *lamp power density* or *illumination power density* of artificial lighting must not exceed the allowance of—
 - (A) 5 W/m² within a *sole-occupancy unit*; and
 - (B) 4 W/m² on a verandah, balcony or the like attached to a *sole-occupancy unit*; and
 - (ii) the *illumination power density* allowance in (i) may be increased by dividing it by the *illumination power density* adjustment factor for a control device in Table J6.2b as applicable; and
 - (iii) when designing the *lamp power density* or *illumination power density*, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and
 - (iv) halogen lamps must be separately switched from fluorescent lamps.
- (b) In a building other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building—
- (i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum *illumination power density* in Table J6.2a; and
 - (ii) the aggregate design illumination power load in (i) is the sum of the design illumination power loads in each of the spaces served; and
 - (iii) where there are multiple lighting systems serving the same space, the design illumination power load for (ii) is—
 - (A) the total illumination power load of all systems; or
 - (B) where a control system permits only one system to operate at a time—
 - (aa) based on the highest illumination power load; or
 - (bb) determined by the formula—

$$[H \times T/2 + P \times (100 - T/2)] / 100$$

where—

H = the highest illumination power load; and

T = the time for which the maximum illumination power load will occur, expressed

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as a percentage; and
 $P =$ the predominant illumination power load.

- (c) The requirements of (a) and (b) do not apply to the following:
- (i) Emergency lighting provided in accordance with [Part E4](#).
 - (ii) Signage, display lighting within cabinets and display cases that are fixed in place.
 - (iii) Lighting for accommodation within the residential part of a *detention centre*.
 - (iv) A heater where the heater also emits light, such as in bathrooms.
 - (v) Lighting of a specialist process nature such as in a surgical operating theatre, fume cupboard or clean workstation.
 - (vi) Lighting of performances such as theatrical or sporting.
 - (vii) Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.
 - (viii) Lighting installed solely to provide photosynthetically active radiation for indoor plant growth on green walls and the like.
- (d) For the purposes of [Table J6.2b](#), the following control devices must comply with [Specification J6](#):
- (i) Lighting timers.
 - (ii) Motion detectors.
 - (iii) Daylight sensors and dynamic lighting control devices.

Table J6.2a Maximum illumination power density

Space	Maximum <i>illumination power density</i> (W/m ²)
Auditorium, church and public hall	8
Board room and conference room	5
<i>Carpark</i> - general	2
<i>Carpark</i> - entry zone (first 15 m of travel) during the daytime	11.5
<i>Carpark</i> - entry zone (next 4 m of travel) during the day	2.5
<i>Carpark</i> - entry zone (first 20 m of travel) during nighttime	2.5
Common rooms, spaces and corridors in a Class 2 building	4.5
Control room, switch room and the like - intermittent monitoring	3
Control room, switch room and the like - constant monitoring	4.5
Corridors	5
Courtroom	4.5
Dormitory of a Class 3 building used for sleeping only	3
Dormitory of a Class 3 building used for sleeping and study	4
Entry lobby from outside the building	9
Health-care - infants' and children's wards and emergency department	4
Health-care - examination room	4.5
Health-care - examination room in intensive care and high dependency ward	6
Health-care - all other <i>patient care areas</i> including wards and corridors	2.5
Kitchen and food preparation area	4
Laboratory - artificially lit to an ambient level of 400 lx or more	6
Library - stack and shelving area	2.5
Library - reading room and general areas	4.5
Lounge area for communal use in a Class 3 or 9c building	4.5
Museum and gallery - circulation, cleaning and service lighting	2.5
Office - artificially lit to an ambient level of 200 lx or more	4.5

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Space	Maximum <i>illumination power density</i> (W/m ²)
Office - artificially lit to an ambient level of less than 200 lx	2.5
Plant room where an average of 160 lx vertical illuminance is required on a vertical panel such as in switch rooms	4
Plant rooms with a horizontal illuminance target of 80 lx	2
Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks	14
Retail space including a museum and gallery whose purpose is the sale of objects	14
<i>School</i> - general purpose learning areas and tutorial rooms	4.5
<i>Sole-occupancy unit</i> of a Class 3 or 9c building	5
Storage	1.5
Service area, cleaner's room and the like	1.5
Toilet, locker room, staff room, rest room and the like	3
Wholesale storage area with a vertical illuminance target of 160 lx	4
Stairways, including <i>fire-isolated stairways</i>	2
Lift cars	3

Notes to Table J6.2a:

- In areas not listed above, the maximum *illumination power density* is—
 - for an illuminance not more than 80 lx, 2 W/m²; and
 - for an illuminance more than 80 lx and not more than 160 lx, 2.5 W/m²; and
 - for an illuminance more than 160 lx and not more than 240 lx, 3 W/m²; and
 - for an illuminance more than 240 lx and not more than 320 lx, 4.5 W/m²; and
 - for an illuminance more than 320 lx and not more than 400 lx, 6 W/m²; and
 - for an illuminance more than 400 lx and not more than 600 lx, 10 W/m²; and
 - for an illuminance more than 600 lx and not more than 800 lx, 11.5 W/m².
- For enclosed spaces with a Room Aspect Ratio of less than 1.5, the maximum *illumination power density* may be increased by dividing it by an adjustment factor for room aspect which is—
 $0.5 + (\text{Room Aspect Ratio}/3)$
 The Room Aspect Ratio of the enclosed space is determined by the formula—
 $A/(H \times C)$,
 where—
 - A is the area of the enclosed space; and
 - H is the height of the space measured from the floor to the highest part of the ceiling; and
 - C is the perimeter of the enclosed space at floor level.
- In addition to 2, the maximum *illumination power density* may be increased by dividing it by the *illumination power density* adjustment factor in Table J6.2b and Table J6.2c and where the control device is not installed to comply with J6.3.
- Circulation spaces are included in the allowances listed in the Table.

Table J6.2b Illumination power density adjustment factor for a control device

Item ^{Note 1}	Description	<i>Illumination power density</i> adjustment factor
Motion detector	In a toilet or change room, other than a public toilet, in a Class 6 building	0.4
Motion detector	Where a group of light fittings serving less than 100 m ² is controlled by one or more detectors	0.6
Motion detector	Where a group of light fittings serving 100 m ² or more is controlled by	0.7

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Item ^{Note 1}	Description	<i>Illumination power density</i> adjustment factor
	one or more detectors	
Programmable dimming system ^{Note 2}	Where not less than 75% of the area of a space is controlled by programmable dimmers	0.85
Fixed dimming ^{Notes 2 and 3}	All fittings with fixed dimming	Whichever is greater of (a) 0.5; or (b) $0.2 + 0.8L$ where L = the illuminance turndown for the fixed dimming.
Lumen depreciation dimming ^{Note 2}	All fittings with lumen depreciation dimming	0.85
Two stage sensor - equipped lights with minimum power of 30 % of peak power or less	Fire stairs and other spaces not used for regular transit	0.4
Two stage sensor - equipped lights with minimum power of 30% of peak power or less	Transitory spaces in regular use or in a <i>carpark</i>	0.7
Daylight sensor and dynamic lighting control device - dimmed or stepped switching of lights adjacent <i>windows</i> ^{Notes 2 and 4}	In a Class 5, 6, 7, 8 or 9c building or a Class 9a building, other than a <i>ward area</i> , where the lights are adjacent <i>windows</i> , other than <i>roof lights</i> , for a distance from the <i>window</i> equal to the depth of the floor to <i>window</i> head height	0.5 ^{Note 2}
Daylight sensor and dynamic lighting control device - dimmed or stepped switching of lights adjacent <i>windows</i> ^{Notes 2 and 4}	Serving a Class 3 or 9c building, or a Class 9a <i>ward area</i> , where the lights are adjacent <i>windows</i> , other than <i>roof lights</i> , for a distance from the <i>window</i> equal to the depth of the floor to <i>window</i> head height	0.75 ^{Note 2}
Daylight sensor and dynamic lighting control device - dimmed or stepped switching of lights adjacent <i>windows</i> ^{Notes 2 and 4}	In a Class 5, 6, 7, 8 or 9b building or a Class 9a building, other than a <i>ward area</i> , where the lights are adjacent <i>roof lights</i> .	0.6 ^{Note 2}
Daylight sensor and dynamic lighting control device - dimmed or stepped switching of lights adjacent <i>windows</i> ^{Note 2 and 4}	In a Class 3 or 9c building, or a Class 9a <i>ward area</i> , where the lights are adjacent <i>roof lights</i>	0.8 ^{Note 2}

Notes to Table J6.2b:

1. A maximum of two *illumination power density* adjustment factors for a control device can be applied to an area. Where more than one *illumination power density* adjustment factor (other than for room aspect) apply to an area, they are to be combined using the following formula:

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$$A \times (B + [(1 - B) / 2]),$$

where—

- a. A is the lowest applicable *illumination power density* adjustment factor; and
 - b. B is the second lowest applicable *illumination power density* adjustment factor.
2. The adjustment factor does not apply to tungsten, halogen or other incandescent sources.
 3. Includes luminaires with a pre-programmed function which provides dimming from ON to OFF (one-stage dimming).
 4. The *illumination power density* adjustment factor is only applied to lights controlled by daylight sensors between 8:00am and 7:00pm.

Table J6.2c Illumination power density adjustment factor for light colour

Light source	Description	<i>Illumination power density</i> adjustment factor
CRI ≥ 90	Where lighting with good colour rendering is used	0.9
CCT ≤ 3500 K ^{Note}	Where lighting with a warm appearance is used	0.8
CCT ≥ 4500 K	Where lighting with a cool appearance is used	1.1

Note to Table J6.2c: Includes luminaires that can adjust their CCT to 3500 K or below.

J6.3 Interior artificial lighting and power control

- (a) All artificial lighting of a room or space must be individually operated by—
 - (i) a switch; or
 - (ii) other control device; or
 - (iii) a combination of (i) and (ii).
- (b) An occupant activated device, such as a room security device, a motion detector in accordance with [Specification J6](#), or the like, must be provided in the *sole-occupancy unit* of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the *sole-occupancy unit* is unoccupied.
- (c) An artificial lighting switch or other control device in (a) must—
 - (i) if an artificial lighting switch, be located in a visible and easily accessed position—
 - (A) in the room or space being switched; or
 - (B) in an adjacent room or space from where 90% of the lighting being switched is visible; and
 - (ii) for other than a single functional space such as an auditorium, theatre, *swimming pool*, sporting stadium or warehouse—
 - (A) not operate lighting for an area of more than 250 m² if in a Class 5 building or a Class 8 laboratory; or
 - (B) not operate lighting for an area of more than—
 - (aa) 250 m² for a space of not more than 2000 m²; or
 - (bb) 1000 m² for a space of more than 2000 m²,
 if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building.
- (d) 95% of the light fittings in a building or *storey* of a building, other than a Class 2 or 3 building or a Class 4 part of a building, of more than 250 m² must be controlled by—
 - (i) a time switch in accordance with [Specification J6](#); or
 - (ii) an occupant sensing device such as—
 - (A) a security key card reader that registers a person entering and leaving the building; or
 - (B) a motion detector in accordance with [Specification J6](#).

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- (e) In a Class 5, 6 or 8 building of more than 250 m², artificial lighting in a natural lighting zone adjacent to *windows* must be separately controlled from artificial lighting not in a natural lighting zone in the same *storey* except where—
 - (i) the room containing the natural lighting zone is less than 20 m²; or
 - (ii) the room's natural lighting zone contains less than 4 luminaires; or
 - (iii) 70% or more of the luminaires in the room are in the natural lighting zone.
- (f) Artificial lighting in a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*, must be controlled by a motion detector in accordance with *Specification J6*.
- (g) Artificial lighting in a foyer, corridor and other circulation spaces—
 - (i) of more than 250 W within a single zone; and
 - (ii) adjacent to *windows*,
 must be controlled by a daylight sensor and dynamic lighting control device in accordance with *Specification J6*.
- (h) Artificial lighting for daytime travel in the first 19 m of travel in a *carpark* entry zone must be controlled by a daylight sensor in accordance with *Specification J6*.
- (i) The requirements of (a), (b), (c), (d), (e), (f), (g) and (h) do not apply to the following:
 - (i) Emergency lighting in accordance with *Part E4*.
 - (ii) Where artificial lighting is needed for 24 hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a *detention centre*.
- (j) The requirements of (d) do not apply to the following:
 - (i) Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as—
 - (A) in a *patient care area* in a Class 9a building or in a Class 9c building; or
 - (B) a plant room or lift motor room; or
 - (C) a workshop where power tools are used.
 - (ii) A heater where the heater also emits light, such as in bathrooms.

J6.4 Interior decorative and display lighting

- (a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—
 - (i) separately from other artificial lighting; and
 - (ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and
 - (iii) by a time switch in accordance with *Specification J6* where the display lighting exceeds 1 kW.
- (b) Window display lighting must be controlled separately from other display lighting.

J6.5 Exterior artificial lighting

- (a) Exterior artificial lighting attached to or directed at the facade of a building, must—
 - (i) be controlled by—
 - (A) a daylight sensor; or
 - (B) a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and
 - (ii) when the total lighting load exceeds 100 W—
 - (A) use LED luminaires for 90% of the total lighting load; or
 - (B) be controlled by a motion detector in accordance with *Specification J6*; or
 - (C) when used for decorative purposes, such as façade lighting or signage lighting, have a separate time

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switch in accordance with [Specification J6](#).

(b) The requirements of (a)(ii) do not apply to the following:

- (i) Emergency lighting in accordance with [Part E4](#).
- (ii) Lighting around a [detention centre](#).

J6.6 Boiling water and chilled water storage units

Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with [Specification J6](#).

J6.7 Lifts

Lifts must—

- (a) be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and
- (b) achieve the idle and standby energy performance level in [Table 6.7a](#); and
- (c) achieve—
 - (i) the energy efficiency class in [Table 6.7b](#); or
 - (ii) if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.

Table 6.7a Lift idle and standby energy performance level

Rated load	Idle and standby ^{Note} energy performance level in accordance with ISO 25745-2
Less than or equal to 800 kg	2
801 kg to less than or equal to 2000 kg	3
2001 kg to less than or equal to 4000 kg	4
Greater than 4000 kg	5

Note to Table 6.7a: Applies to the standby power used after 30 minutes.

Table 6.7b Lift energy efficiency class

Usage category in accordance with ISO 25745-2	Energy efficiency class in accordance with ISO 25745-2
1 - 4	C
> 5	D

J6.8 Escalators and moving walkways

Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.05 m/s when unused for more than 15 minutes.

Specification J6

Lighting and power control devices

*Deemed-to-Satisfy Provisions***1. Scope**

This Specification contains the requirements for lighting and power control devices including timers, time switches, motion detectors and daylight control devices.

2. Lighting timers

A lighting timer must—

- (a) be located within 2 m of every entry door to the space; and
- (b) have an indicator light that is illuminated when the artificial lighting is off; and
- (c) not control more than—
 - (i) an area of 100 m² with a single push button timer; and
 - (ii) 95% of the lights in spaces of area more than 25 m²; and
- (d) be capable of maintaining the artificial lighting—
 - (i) for not less than 5 minutes; and
 - (ii) for not more than 12 hours if the timer is reset.

3. Time switch

- (a) A time switch must be—
 - (i) capable of switching on and off electric power at variable pre-programmed times and on variable pre-programmed days; and
 - (ii) configured so that the lights are switched off at any time the space is designated to be unoccupied.
- (b) A time switch for internal lighting must be capable of being overridden by—
 - (i) a means of turning the lights on, either by—
 - (A) a manual switch, remote control or an occupant sensing device that on sensing a person's presence, overrides the time switch for a period of up to 2 hours, after which if there is no further presence detected, the time switch must resume control; or
 - (B) an occupant sensing device that overrides the time switch upon a person's entry and returns control to the time switch upon the person's exiting, such as a security card reader or remote control; and
 - (ii) a manual "off" switch.
- (c) A time switch for external lighting must be—
 - (i) configured to limit the period the system is switched on to between 30 minutes before sunset and 30 minutes after sunrise is determined or detected including any pre-programmed period between these times; and
 - (ii) capable of being overridden by a manual switch, remote control or a security access system for a period of up to 8 hours, after which the time switch must resume control.
- (d) A time switch for boiling water or chilled water storage units must be capable of being overridden by a manual switch or a security access system that senses a person's presence, overrides for a period of up to 2 hours, after which if there is no further presence detected, the time switch must resume control.

4. Motion detectors

- (a) In a Class 2, 3 or 9c *residential care building* other than within a *sole-occupancy unit*, a motion detector must—
 - (i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and

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- (ii) be capable of detecting a person before they are 1 m into the space; and
 - (iii) other than within a *sole-occupancy unit* of a Class 3 building, not control more than—
 - (A) an area of 100 m²; and
 - (B) 95% of the lights in spaces of area more than 25 m²; and
 - (iv) be configured so that the lights are turned off when the space is unoccupied for more than 15 minutes; and
 - (v) be capable of being overridden by a manual switch only enabling the lights to be turned off.
- (b) In a Class 5, 6, 7, 8, 9a or 9b building, a motion detector must—
- (i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and
 - (ii) be capable of detecting—
 - (A) a person before they have entered 1 m into the space; and
 - (B) movement of 500 mm within the useable part of the space; and
 - (iii) not control more than—
 - (A) in other than a *carpark*, an area of 500 m² with a single sensor or group of parallel sensors; and
 - (B) 75% of the lights in spaces using high intensity discharge; and
 - (iv) be configured so that the lights are turned off when the space is unoccupied for more than 15 minutes; and
 - (v) be capable of being overridden by a manual switch that only enables the lights to be turned off.
- (c) When outside a building, a motion detector must—
- (i) be capable of sensing movement such as by pressure, infra-red, ultrasonic or microwave detection or by a combination of these means; and
 - (ii) be capable of detecting a person within a distance from the light equal to—
 - (A) twice the mounting height; or
 - (B) 80% of the ground area covered by the light's beam; and
 - (iii) not control more than five lights; and
 - (iv) be operated in series with a photoelectric cell or astronomical time switch so that the light will not operate in daylight hours; and
 - (v) be configured so that the lights are turned off when the area is unoccupied for more than 15 minutes; and
 - (vi) have a manual override switch which is reset after a maximum period of 4 hours.
- (d) When in a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*, a motion detector must—
- (i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and
 - (ii) be capable of detecting—
 - (A) movement of 500 mm within the useable part of the space; and
 - (B) a person before they have entered 1 m into the space; and
 - (iii) be configured so that the lights dim to a 30% peak power or less when the space is unoccupied for more than 15 minutes.

5. Daylight sensor and dynamic lighting control device

- (a) A daylight sensor and dynamic control device for artificial lighting must—
 - (i) for switching on and off—
 - (A) be capable of having the switching level set point adjusted between 50 and 1000 lux; and

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- (B) have—
 - (aa) a delay of more than 2 minutes; and
 - (bb) a differential of more than 100 lux for a sensor controlling high pressure discharge lighting, and 50 lux for a sensor controlling other than high pressure discharge lighting; and
- (ii) for dimmed or stepped switching, be capable of reducing the power consumed by the controlled lighting in proportion to the incident daylight on the working plane either—
 - (A) continuously down to a power consumption that is less than 50% of full power; or
 - (B) in no less than 4 steps down to a power consumption that is less than 50% of full power.
- (b) Where a daylight sensor and dynamic control device has a manual override switch, the manual override switch must not be able to switch the lights permanently on or bypass the lighting controls.