



Building Based Lighting Upgrade Guide

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Contents

Introduction to this guide	3
About this guide	3
Who should use this guide	3
Before you begin	3
Seeking assistance	4
Legal context for this guide	4
1. Introduction to building based lighting upgrades	5
1.1. Which upgrades are eligible?	5
2. Calculating the number of eligible VEECs	7
2.1. Upgrades: Areas and calculation zones	7
2.2. Calculation variables	10
3. Requirements for personnel undertaking building based lighting upgrades	16
3.1. Product safety, OHS and compliance with standards	16
3.2. Required installer training and qualifications	16
3.3. Role of the supervising electrician	16
3.4. Role of the upgrade manager	17
3.5. Using subcontractors	17
4. Activity requirements	18
4.1. Assignment of rights to create VEECs	18
4.2. Decommissioning and recycling requirements	18
4.3. Compliance with AS/NZS 1680	20
4.4. Retrofit/Modification of luminaires and obligation to meet power factor requirements	22
5. Record keeping and evidence requirements	24
5.1. Record keeping obligations	24
5.2. Geo-tagged photograph obligations	24
5.3. Upgrades in portable buildings	24
5.4. Evidence of assignment of rights to create VEECs	25
5.5. Evidence of commercial transaction and energy consumer	25
5.6. Evidence of space type	26
5.7. Baseline lighting configuration	27
5.8. Upgrade lighting configuration	28
5.9. Evidence of air conditioning	29
5.10. Evidence of electrical compliance	29
5.11. Evidence of decommissioning and recycling of lighting equipment	30
5.12. Evidence of AS/NZS 1680 compliance	31
5.13. Evidence of AS/NZS 1680 compliance exemption (if applicable)	31
6. Building based lighting upgrade process	33
6.1. Become accredited	33

6.2. Get your product approved	33
6.3. Pre-calculate VEECs	33
6.4. Gather baseline information	36
6.5. Undertake the upgrade and gather information	36
6.6. Assignment of rights	36
6.7. Decommission and recycle removed lighting equipment	36
6.8. Collect documentation and create VEECs online	36
6.9. Commission assesses VEEC creation claims	40
6.10. Commission registers VEECs	40
Glossary	41
Appendix A: Table of relevant standards in the AS/NZS 1680 series	44
Appendix B: Evidence checklist	45
Appendix C: Space type evidence requirements	47
Appendix D: VEEC calculation for building based lighting upgrades	71
Appendix E: Lamp ballast combination	76
Appendix F: Example of a professionally drafted reflective ceiling plan	80

Introduction to this guide

Accredited persons (APs) under the Victorian Energy Upgrade (VEU) program must comply with program requirements when undertaking building based lighting upgrade (activity 34) to create Victorian energy efficiency certificates (VEECs).

About this guide

Use this guide for assistance in meeting the specific requirements of building based lighting upgrades activities under the VEU program:

- Section 1 explains the eligibility criteria for lighting upgrades under the program
- Section 2 explains the variables you will use to create VEECs for activities
- Section 3 lists upgrade installer requirements
- Section 4 details requirements for each activity you undertake, including compliance with external standards
- Section 5 lists record keeping and evidence requirements for your upgrades
- Section 6 is a step-by-step guide on how to create VEECs using the building based lighting upgrade activity under the program.

Who should use this guide

You should use this guide if you are:

- seeking accreditation to undertake this activity. It will help you to understand the activity and evidence requirements you must meet to create and register VEECs
- accredited to undertake building based lighting upgrades. It will help you understand the evidence you need to calculate energy savings and register VEECs for this activity.

Before you begin

This activity is complex, both administratively and technically. Participants should dedicate considerable time to understand the activity requirements, even if you have considerable experience in the lighting industry.

To further understand how to participate in this activity, including your obligations, review the following documents:

- VEEC Assignment Form Template: Building Based Lighting Upgrade (Activity 34) – Business and Non-Residential Premises
- AS/NZS 1680 Compliance Declaration Template: Building Based Lighting Upgrade (Activity 34)

- Obligations and Program Guide for Accredited Persons

The above documents can be accessed from www.esc.vic.gov.au/building-based-lighting and www.esc.vic.gov.au/veu-accredited-persons

Seeking assistance

If you are unsure about any aspects of undertaking this activity, and cannot find the answer in this guide or the documents listed above, contact us on (03) 9032 1310 or veu@esc.vic.gov.au.

Legal context for this guide

We have prepared this guide as a general summary of relevant parts of:

- Victorian Energy Efficiency Target Act 2007 (the VEET Act)
- Victorian Energy Efficiency Target Regulations 2018 (the VEET Regulations)
- Victorian Energy Upgrades Specifications 2018 (the VEU specifications)
- Victorian Energy Efficiency Target Guidelines (the VEET guidelines).

These documents are available at www.esc.vic.gov.au/veu-legislation

This guide should not be relied upon as substitute for legal advice and should be read in conjunction with the above source documents. In the event of inconsistency between this guide and the source documents, the content in the source documents apply.

1. Introduction to building based lighting upgrades

Building based lighting upgrades take place in a building or structure covered by the Building Code of Australia (BCA). This includes external lighting fixed to those buildings or structures.

1.1. Which upgrades are eligible?

For your building based lighting upgrade to be eligible under the VEU program:

- the activity must take place in an eligible premises the upgrade must be undertaken in accordance with activity requirements.
- the product installed must be eligible.
- you must be accredited with relevant approvals to undertake building based lighting upgrades.

1.1.1. Eligible premises

To be eligible for a building based lighting upgrade, a premises must:

- be connected to an electricity supply at the time of the upgrade
- not be a 'scheduled activity premises' as defined in Regulation 4 of the VEET Regulations, unless it has been 'opted in' to the program as described in Regulation 28.

1.1.2. Eligible upgrade activities

For an upgrade activity to be eligible:

- The treatment of the works as part of the same upgrade must be reasonable and defensible.
- The upgrade must have been completed after the date on which you lodged your application for accreditation or application for additional activity approval.
- The existing lighting equipment must be connected to an electricity supply before the upgrade if it is decommissioned.
- The existing lighting equipment must be connected to an electricity supply both before and after the upgrade, and must be operable after the upgrade, if it is not decommissioned.
- You must have all necessary documentation to verify the pre-upgrade (baseline) lighting situation.

1.1.3. Eligible products

Any product installed as part of a building based lighting upgrade must be listed as an approved product on our Register of Products at the time of VEEC creation. The documentary requirements for a lighting product application differ depending on the nature of product being applied for.

Learn more about applying for lighting product approvals, by reading our Lighting Product Application Guide available at www.esc.vic.gov.au/veu-product-applicants

1.1.4. Appropriate accreditation and approvals from us

You must be accredited by us for building based lighting upgrade (Activity 34) in order to undertake this activity. You will also require specific commission approval to undertake retrofit upgrades (see Section 4.4).

Find out how to become accredited for this activity at [www.esc.vic.gov.au/ become-veu-accredited](http://www.esc.vic.gov.au/become-veu-accredited)

2. Calculating the number of eligible VEECs

The number of VEECs awarded for your upgrade depends on a number of variables.

The calculations used to determine the energy savings of a given upgrade project vary depending on whether the upgrade is part of a site refurbishment that requires a building permit, and is required to comply with Part J6 of the BCA. The shorthand terminology used to describe this distinction in this document is 'J6' and 'Non-J6'.

J6 and Non-J6 upgrades have different equations for calculating VEECs, and different data and documentation requirements. Because of this, each upgrade type has its own unique activity creation screen, upload form (which you can use to create VEECs) and calculator. You will see the two options in the relevant drop down menus on the VEU registry website.

The number of VEECs you receive for a given upgrade is based on the deemed abatement associated with that upgrade. The deemed abatement is calculated using assumptions about an upgrade's energy saving factors (such as the operating hours of a business and mode of operation), which may vary from the actual abatement.

The VEEC calculation method is explained in part 34 of the VEU specifications, and in Appendix D of this guide. An explanation of some of the calculation variables is provided in Section 2.2 below.

2.1. Upgrades: Areas and calculation zones

To calculate the baseline and upgrade energy use for a given upgrade, you must subdivide the upgrade into smaller components (known as calculation zones). How you subdivide the upgrade into calculation zones depends on the specific project. A calculation zone is a physical space (J6) or series of lamps (Non-J6) for which all of the variables of the relevant greenhouse gas emissions reduction equation are common.

For a J6 upgrade, the **baseline calculation** for the project must be divided into calculation zones with a common space type, lighting control device configuration and air-conditioning environment.

For a non J6 upgrade, the **baseline calculation** for the project must be divided into calculation zones containing common incumbent lamps with the same nominal lamp power and rated lifetime hours (if a retrofit scenario), and sharing a common space type, asset lifetime, control device and air-conditioning environment.

For both J6 and non-J6 upgrades, the **upgrade calculation** for the project must be divided into calculation zones with a common upgrade lamp, lighting control device installed, area space type, asset lifetime reference and air-conditioning environment.

This information, and the definition of a calculation zone, is represented in Figure 1. Even for simple upgrades, there will normally be at least two calculation zones; one for the baseline and one for the upgrade. Complex upgrades may require many more. The online upload form can accommodate up to 50 calculation zones.

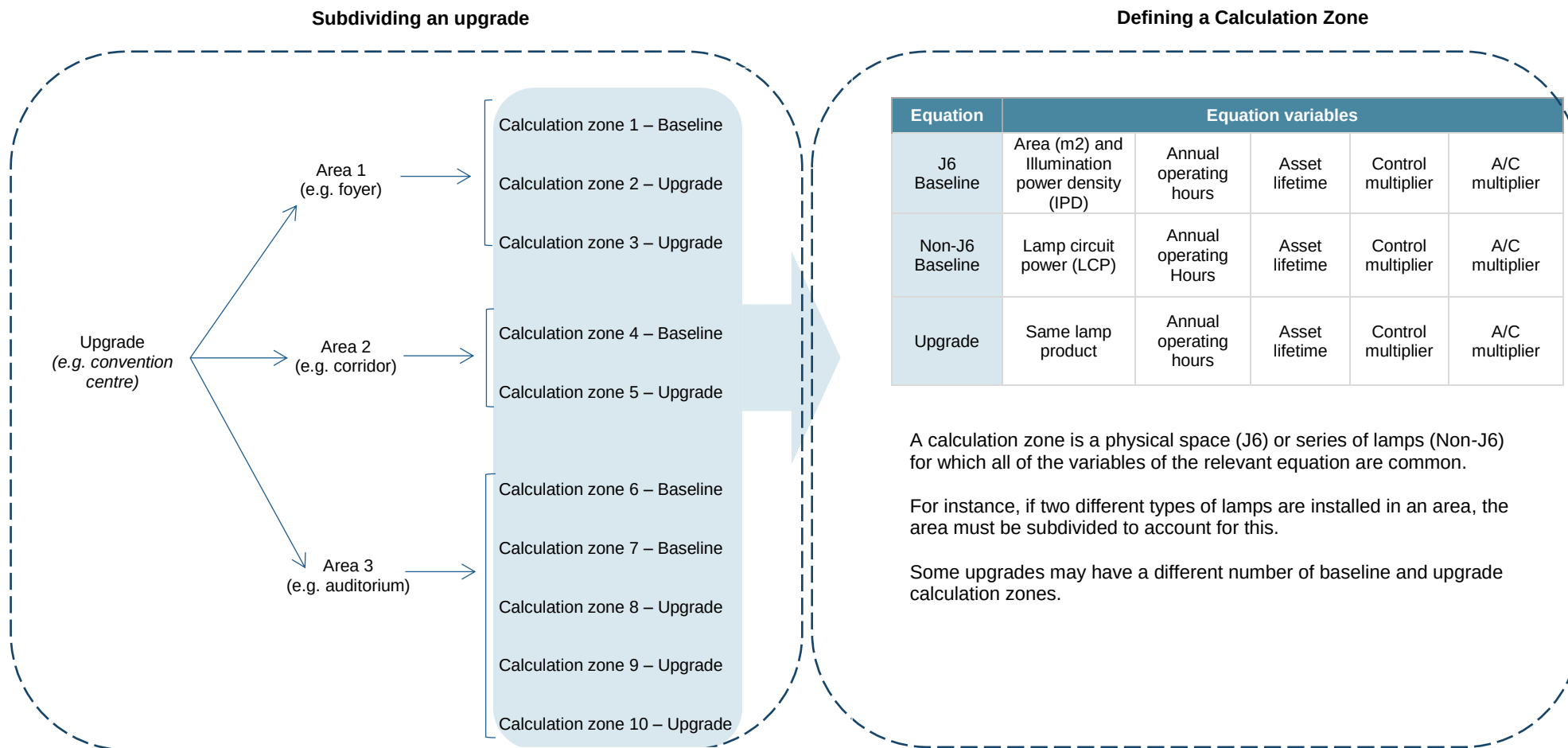


Figure 1: Dividing an upgrade project into calculation zones

2.2. Calculation variables

2.2.1. Lamp circuit power

One factor in the VEEC calculation is the lamp circuit power (LCP), which refers to the combined power draw of the lamp and its control gear (light source). For most baseline and upgrade light sources, the LCP is determined by adding a default factor to the nominal lamp power (NLP) of the lamp as set out in Table 17 of this guide.

We can determine the LCP for products not listed in this table. Apply for a LCP determination by emailing your application to: veu@esc.vic.gov.au. You will need to provide us with laboratory tests on the lamp and its control gear in support of your application.

2.2.2. Asset lifetime

An upgrade's asset lifetime variable depends on the type of upgrade undertaken (see Table 1). Typically, more permanent upgrades which cannot be reversed without the services of an electrician receive higher asset lifetimes. Those that are easily reversible by the consumer receive lower asset lifetimes.

Importantly, within one upgrade project you may need to select different asset lifetimes. For instance, where you undertake permanent upgrades in one area of the premises (such as a luminaire replacement in an office space) and then do reversible upgrades in another area (like delamping in a storeroom), you will use different asset lifetimes for each of the two areas.

When entering VEEC creation data for an upgrade activity, you must select the same asset lifetime for the baseline ('before') calculation zone and the upgrade ('after') calculation zone **for each area of the upgrade activity**.

Table 1: Asset lifetime references

Condition met by lighting upgrade	Asset lifetime (years)
Luminaire replacement: The existing luminaire is replaced	10
Modification: The incumbent lamp is replaced and all legacy control gear not essential for the operation of the upgrade lamp is either removed from the site or from the electrical circuit so that it does not draw any power	5
Retrofit: The incumbent lamp is replaced and any wiring or structure of the luminaire is kept intact, other than the removal, replacement or modification of the starter and the removal of the legacy capacitor	Lifetime for the <u>upgrade</u> lamp, determined in accordance with our performance requirements (in hours and not exceeding 30,000 hours), divided by annual operating hours, to a maximum of 5 years

Condition met by lighting upgrade	Asset lifetime (years)
Delamping: The lamp is removed from a luminaire that houses multiple lamps, where no more than half of the lamps are removed; all legacy control gear not essential for the operation of remaining lamp(s) is either removed from the site or from the electrical circuit so that it does not draw any power	5
Lighting control device: A lighting control device is installed and no lighting equipment of any other type is installed in the space	5
Luminaire decommissioning: The lamp is removed and not replaced, and either the luminaire or all legacy control gear is removed from the site or from the electrical circuit so that it does not draw any power	10
New installation of lighting equipment (only applicable for J6 upgrades): This applies to the installation of a light sources such as a lamp or luminaire and any associated control gear, when the installation does not fall into one of the other above listed 'conditions met by lighting upgrade'	10
In any other case	Manufacturer's rated lifetime (in hours and not exceeding 30,000 hours) for the <u>incumbent</u> lamp divided by annual operating hours, to a maximum of 5 years

2.2.3. Annual operating hours and illumination power density

Another factor in the VEEC calculation is the 'annual operating hours' as set out in Table 15 of this guide. Illuminated Power Density (IPD) is also noted in Table 15 for use in certificate calculation equations for J6 upgrade projects.

The BCA options listed in Table 16 are only needed should they be called upon in the annual operating hours column in Table 15. In all other instances, the space type option selected will provide the annual operating hours for the abatement calculation.

For non-J6 upgrades, when upgrading a space type that refers to the BCA options in Table 16, you will need to select one of the BCA classification options as your 'space type' entry in your certificate creation form.

For J6 upgrades:

- when upgrading a space type that refers to the BCA options in Table 16, you will need to select the relevant space as your 'space type' entry and the relevant BCA classification option as your 'BCA classification' entry in your certificate creation form.
- when upgrading a space type that is not listed in the annual operating hours column in Table 15, you will need to select a relevant unlisted space type as your 'space type' and then select the relevant BCA classification option as your 'BCA classification' entry in your certificate creation form.

Upgrades occurring in spaces/buildings with different or multiple classifications

When a building or space serves multiple purposes and may have more than one classification, you should apply the following principles (as specified in the BCA):

- Where parts have different purposes (if not more than 10 per cent of the floor area¹ of a storey²) and where the minor use is used for a purpose which is a different classification, the classification applying to the major use may apply to the whole storey.
- The provisions of (a) (above) do not apply when the minor use is a laboratory of Class 2, 3 or 4.
- BCA classifications classes 1a, 1b, 7a, 7b, 9a, 9b, 9c, 10a, 10b and 10c are each regarded as separate classifications.
- A reference to:
 - Class 1 refers to Class 1a and/or 1b
 - Class 7 refers to Class 7a and/or 7b
 - Class 9 refers to Class 9a, 9b and/or 9c
 - Class 10 refers to Class 10a, 10b and/or 10c.
- A plant room, machinery room, lift motor room, boiler room or the like must have the same classification as the part of the building in which it is situated.
- If a building or part of a building has more than one classification applying to the whole building or part in accordance with (a) (above), that building or part must comply with all the relevant provisions of the BCA for each classification.

¹ Floor Area means:

1. In relation to a building: the total area of all storeys.
2. In relation to a storey: the area of all floors of that storey measured over the enclosing walls, including
 - a) the area of a mezzanine within the storey, measured within the finished surfaces of any external walls
 - b) the area occupied by any internal walls or partitions, any cupboard, or other built-in furniture, fixture or fitting
 - c) if there is no enclosing wall, an area which has a use that contributes to the fire load; or impacts on the safety, health or amenity of the occupants in relation to the provisions of the BCA.
3. In relation to a room: the area of the room measured within the finished surfaces of the walls, and includes the area occupied by any cupboard or other built-in furniture, fixture or fitting.
4. In relation to a fire compartment: the total area of all floors within the fire compartment measured within the finished surfaces of the bounding construction, and if there is no bounding construction, includes an area which has a use which contributes to the fire load.

In relation to an atrium: the total area of all floors within the atrium measured within the finished surfaces of the bounding construction and if no bounding construction, within the external walls.

² Storey means a space within a building which is situated between one floor level and the next floor level above, or if there is no floor above, the ceiling or roof above, but not:

1. A space that only contains:
 - a) a lift shaft, stairway or meter room
 - b) a bathroom, shower room, laundry, water closet, or other sanity compartment
 - c) accommodation intended for more than 3 vehicles
 - d) a combination of the above.
2. A mezzanine.

To help identify the correct space type for your upgrade, read part A3 of the NCC Building Code of Australia – Volume One (as amended from time to time), and part A3 of the Guide to the BCA - Volume One.

External lighting affixed to eligible buildings or structures

The principles outlined above, do not apply to external lighting affixed to eligible buildings or structures attached to buildings (e.g. a canopy). In this case the major BCA classification of the building applies, along with the annual operating hours of the main building.

Open air car parks

Luminaires attached to the inner walls of an open air car park that is classified as Class 7a under Part A3 of the Building Code, are eligible under building based lighting upgrades (activity 34).

However, luminaires in an open air car park environment attached to a pole, bollard, canopy, or similar, must be undertaken under non-building based lighting (activity 35). Refer to the Non-Building Based Lighting Activity Guide available at www.esc.vic.gov.au/non-building-based-lighting for guidance regarding these types of installations.

Class 10b structures

The BCA defines a Class 10b structure as 'a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like'.

Free-standing lights, street lights, traffic lights or similar, **are not** regarded as lights affixed to a Class 10b structure. They are instead a form of non-building based lighting and can be upgraded under activity 35 (provided you satisfy those activity requirements).

Register of BCA Classification Determinations

A Register of BCA Classification Determinations is available at www.esc.vic.gov.au/building-based-lighting. This register lists the classification for various space types resulting from queries we have received. You should apply the BCA classification listed in the register. If you need guidance to identify the right classification, please email your query to veu@esc.vic.gov.au.

2.2.4. Control multiplier

A control multiple is another factor in the VEEC calculation. This factor applies when a lighting control device (LCD) is present in either the baseline or upgrade environment. The control multiplier value awarded to a particular activity is detailed in Table 2.

Table 2: Control multiplier values for baseline and upgrade calculations at all sites

Number of LCDs		Types(s) of LCDs	Control multiplier
None	N/A		1.00

One	Occupancy sensor that controls 1 to 2 luminaires	0.55
	Occupancy sensor that controls 3 to 6 luminaires	0.70
	Occupancy sensor that controls more than 6 luminaires	0.90
	Daylight-linked control	0.70
	Programmable dimmer	0.85
	Manual dimmer	0.90
	Voltage reduction unit	$V^2 \div 240^2$, where V is the output voltage of the voltage reduction unit
More than one	A combination of one occupancy sensor that controls 1 to 2 luminaires, and any other LCD(s)	0.4 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	A combination of one occupancy sensor that controls 3 to 6 luminaires, and any other LCD(s)	0.5 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs
	Any LCDs, except occupancy sensors that control 1 to 6 luminaires	0.6 or, if greater, the multiple of the two lowest control multiplier values for the combination of LCDs

An LCD can either be in-built into the upgrade lamp and/or installed as separate devices to the lamp. Table 3 details how the system will apply control multiplier values for the purposes of calculating the number of VEECs based on data entered for an activity's upgrade zone in the VEEC creation form.

Table 3: How the control multiplier value will be applied based on activity data entered for a VEEC creation claim

Lamp installed	Integrated LCD features activated?	Other LCD devices installed?	Control multiplier applied
No integrated LCD features	Not applicable	No LCD devices entered	No value applied
		Allowed to install, and enter, any LCD devices in your VEEC claim	Calculated based on LCD devices installed

With integrated LCD features	Yes	Not allowed to enter LCD devices which are the same as that integrated into the lamp in your VEEC claim	Calculated based on LCD features of lamp
		Allowed to install, and enter, LCD devices which are different to that integrated into lamp in your VEEC claim	Calculated based on combination of LCD features of lamp and LCD devices installed
With integrated LCD features	No	Allowed to install, and enter, any LCD devices in your VEEC claim	Calculated based on LCD devices installed

For baseline zones, control multiplier values will be calculated based on your entries in the LCD fields in the VEEC creation form. If the baseline environment contains a lamp with integrated LCD features, you will need to specify the lamps' LCD features in the LCD fields in the VEEC creation form.

3. Requirements for personnel undertaking building based lighting upgrades

All building based lighting upgrades must be undertaken by licensed electricians registered by Energy Safe Victoria, and must comply with all relevant laws and regulations.

3.1. Product safety, OHS and compliance with standards

You must comply with all relevant laws and regulations, including occupational health and safety (OHS), even if you subcontract the installation to a third party.

To minimise risk and ensure a safe work environment, you and your installers should be aware of the risks applicable to lighting upgrades in building based environments including:

- activity installation risks – relating to installers and the general public where installations are associated with working at heights, requiring the use of specialist equipment (e.g. elevated work platforms)
- product risks – risks may also depend on the type of upgrade activity and where that activity is being undertaken.

3.2. Required installer training and qualifications

All building based lighting upgrades must be undertaken by a licensed electrician (also known as an 'A Grade' electrician). Work may also be performed by the holder of a supervised worker's licence (L) or (ES) (i.e apprentices) provided they are effectively supervised by an A Grade electrician in accordance with the guidance outlined in Energy Safe Victoria's supervising framework.³

3.3. Role of the supervising electrician

For each upgrade, an A Grade electrician must be nominated as the supervising electrician. This person must provide relevant details, including their licence number, and sign the VEEC assignment form.

³ In particular the elements of effective supervision outlined in <https://www.esv.vic.gov.au/technical-information/electrical-installations-and-infrastructure/electrical-technical-guidelines-and-determinations/requirements-for-the-effective-supervision-of-apprentice-electricians/>

3.4. Role of the upgrade manager

For each upgrade, you must nominate a single person (referred to as the upgrade manager) to legally represent your business to verify the documentation for the upgrade, including but not limited to the VEEC assignment form and the AS/NZS 1680 compliance declaration.

You don't need to directly employ the upgrade manager but they must have the authority to sign on your behalf. Additionally, the role of the upgrade manager, as defined by the VEEC assignment form and other program documentation, must be completed by a single person.

3.5. Using subcontractors

You, as the accredited person, may use sub-contractors to conduct lighting upgrades on your behalf. However, all responsibility and liability under the program rests with you. This means that if a subcontractor does not comply with a relevant law or fails to properly record information about the upgrade, you may be subject to compliance action.

As the use of subcontractors may represent a compliance risk, you must provide information about the contractual arrangements on the VEEC assignment form for each upgrade you undertake.

4. Activity requirements

You should be aware of, and adhere to, specific requirements that apply to building based lighting upgrades, to ensure that you comply with the legislation.

4.1. Assignment of rights to create VEECs

A consumer may assign their right to create VEECs to an AP. A VEEC assignment form must be completed (by both the consumer and the upgrade manager) for you to create VEECs and demonstrate compliance with the legislation.

Download the VEEC assignment form template for this activity at www.esc.vic.gov.au/building-based-lighting.

You must give the consumer a copy of the VEEC assignment form (or a document containing the same information) at the time of signing (for written assignment) or within 10 business days (for electronic assignment). You must also ensure that all personal information collected in the VEEC assignment form is held in accordance with the Information Privacy Principles (IPPs) under the Privacy and Data Protection Act 2014 (Vic).

Details of how to comply can be found at www.privacy.vic.gov.au.

4.2. Decommissioning and recycling requirements

4.2.1. Meeting your decommissioning declaration requirements

You, or your associate, or an entity under your instructions, must not install a product for the purposes of decommissioning it as part of an activity under the program (i.e. you have not altered the baseline environment for a given installation for the purposes of inflating the VEEC claim for that installation).

For a building based lighting upgrade activity involving the decommissioning of product(s), you, your installer, and the consumer will need to provide a declaration to us stating that the decommissioned product was not installed for the purposes of decommissioning it as part of this activity under the program. This declaration must be made:

- as part of your VEEC assignment form (by the energy consumer and your installer) – either in electronic or in written form
- as part of you accepting the terms and conditions of your VEEC creation claim made via your VEU account.

4.2.2. Meeting EPA's waste management requirements

From 1 July 2019, every person must comply with the Environment Protection Authority's Waste Management Policy (E-Waste) (e-waste policy) which is banning e-waste from landfill.

The e-waste policy places operational and recordkeeping requirements on e-waste service providers, which is defined as any person who conducts a business or undertaking that accepts e-waste for collection, storage, handling, transport or reprocessing.

There are additional recordkeeping requirements placed on those who transport and/or reprocess lighting equipment, as they are categorised as specified electronic waste.

The e-waste policy can be found on the [Victorian Government Gazette website](#).

4.2.3. Meeting your recycling requirements for mercury-containing equipment under VEU program

If your activity involves the decommissioning of mercury containing equipment, you must dispose of that equipment prior to certificate creation in the waste disposal facility set out in Table 4 below.

Table 4: Recycling requirements for lighting equipment

Type of lighting equipment	Eligible disposal facilities
Mercury-containing equipment: Lamps that use mercury for their operation and any other lighting equipment potentially contaminated with mercury as a result of in-house recycling or disassembling attempts	A licensed recycling facility ⁴ : A facility licensed by the EPA to accept D121 waste for the purpose of recycling at that facility (i.e. has a license with treatment code R4 for D121 waste)

This requirement does not preclude you from transporting your equipment to a licensed temporary holding facility⁵ that will forward your equipment to a licensed recycling facility for recycling. As evidence of proper disposal and decommissioning, you must obtain and maintain a recycling invoice from the licensed recycling facility for the decommissioned lighting equipment prior to VEEC creation.

A list of facilities and their EPA license conditions is available from: <https://portal.epa.vic.gov.au>

Details of your decommissioning practices must be supplied to us for review before you are accredited to undertake this activity.

⁴ Facilities licensed to recycle mercury-containing waste by the relevant environmental protection regulator in other jurisdictions, are also considered a licensed recycling facility for the purposes of this determination

⁵ A facility licensed by the EPA to accept D121 waste for storage pending recycling or accumulation of material intended for recycling (i.e. has a license with treatment codes D15 and/or R13 for D121 waste)

4.3. Compliance with AS/NZS 1680

Each building based lighting upgrade is required to:

- achieve the minimum illuminance specified in the relevant part or parts of AS/NZS 1680
- achieve the recommended level of maintained illuminance specified in the relevant part or parts of AS/NZS 1680.

The only exception to the above, is where a lighting upgrade is not required to achieve the minimum illuminance or recommended level of maintained illuminance specified in the relevant part of AS/NZS 1680. If this applies to your lighting upgrade, you may apply to us for an exemption to AS/NZS 1680 (see Section 4.3.5 for information on how to apply for an exemption).

Refer to Appendix A for list of the relevant parts of the AS/NZS 1680 standard.

4.3.1. Identifying the AS/NZS 1680 standard that applies to your upgrade

Methodologies for ensuring compliance are contained within the standard. You should consult the AS/NZS 1680 (the standard governing internal lighting) to determine the applicable methodology for your upgrade. Refer to Appendix A for list of the relevant parts of the AS/NZS 1680.

4.3.2. Maintained illuminance, relamping cycles and lumen depreciation under AS/NZS 1680

Maintained illuminance is a separate measure from the amount of illuminance achieved on the day of the upgrade. Maintained illuminance refers to the amount of illuminance the upgrade must achieve during the period of the relamping cycle (sometimes called a maintenance cycle).

The relamping cycle is the period after which the lamps should be replaced in order to remain compliant with the illuminance levels in the relevant part of AS/NZS 1680. You must recommend a relamping cycle to the client, measured in hours. The relamping cycle is one of the factors you use to determine how much lumen depreciation to expect.

The nominated relamping cycle gives you the period over which you must calculate the anticipated lumen depreciation. Lumen depreciation refers to how much the light emitted by the lamp will reduce over time. Different lighting technologies have different lumen depreciation curves.

Figure 2 provides an example of how the lumen depreciation would be calculated for the installation of a particular LED product.

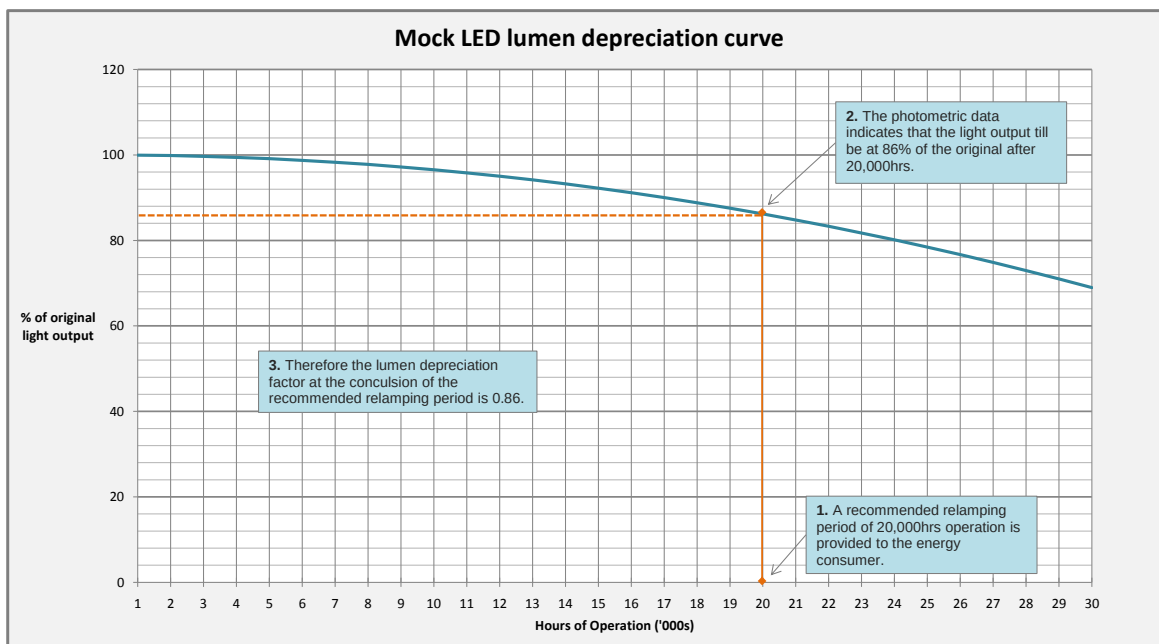


Figure 2: Example workings to establish lumen depreciation

4.3.3. AS/NZS 1680 compliance declaration

For each upgrade you must complete an AS/NZS 1680 compliance declaration. Access the template at www.esc.vic.gov.au/building-based-lighting. On the declaration, you must state whether you undertook a computer based lighting design and, if so, the qualifications of the lighting designer/light level verifier and the light level verification method you used.

4.3.4. AS/NZS 1680 lighting designer qualifications

For building based lighting upgrades, there is no minimum training or qualifications for conducting lighting design or lux reports (except for where an AP has applied for an exemption from AS/NZS 1680 compliance).

You should satisfy yourself that the people you engage are sufficiently skilled and experienced to ensure that your upgrades meet the requirements of AS/NZS 1680 as they apply to the VEU program. If unsure, you should consult the lighting design peak body, the Illuminating Engineering Society of Australia and New Zealand (IESANZ).

4.3.5. AS/NZS 1680 exemption process

For some building based lighting upgrades, the minimum or maintained illuminance levels specified by the relevant part of AS/NZS 1680 might not be applicable to your lighting upgrade. In these instances, you may seek an exemption from complying with AS/NZS 1680 by submitting an

exemption application to us via veu@esc.vic.gov.au prior to the commencement of the upgrade. The exemption application must be prepared by a qualified lighting designer⁶ and must:

- specify why it is unreasonable to expect the lighting upgrade to achieve the minimum illuminance or recommended level of maintained illuminance specified in the relevant part of AS/NZS 1680
- propose an alternative standard applicable to the upgrade and provide a rationale for why it is applicable to the given purpose/task relating to the lighting upgrade
- provide evidence that the proposed standard is equivalent to the intent of the principal standard (being AS/NZS 1680) and appropriate for the installation environment
- provide details of the minimum or maintained illuminance (lux) levels that apply to each area of the lighting upgrade
- provide additional requirements relevant to the lighting upgrade (e.g. light level depreciation, glare, uniformity of illuminance, recommended maintenance regime, where relevant).

4.4. Retrofit/Modification of luminaires and obligation to meet power factor requirements

You must:

- measure and assess the power factor of the upgraded lighting circuit if you elect to retrofit linear LED lamps into linear fluorescent luminaires without removal of the legacy ballast
- ensure the upgrade meets relevant legislation, codes and guidelines relating to power factor and does not have a detrimental impact on the customer's compliance with Section 4.3 of the Electricity Distribution Code (view the Electricity Distribution Code at <https://www.esc.vic.gov.au/electricity-distribution-code>)
- obtain approval from us for your proposed power factor measurement and assessment methodology prior to proceeding.

If you replace a linear fluorescent lamp with an LED tube, you should also ensure that you understand the OHS, compliance, warranty and recordkeeping implications, which require you to:

- confirm that your product meets the requirements set out in the AS/NZS 60598.2.1:2014 standard for these luminaires
- ensure the products you install do not pose any unreasonable electrical risks to your installers or to your client, either during the installation process or post-installation

⁶ The lighting designer must hold one of the following qualifications:

- 'Member' of the Illuminating Engineering Society of Australia and New Zealand Limited (MIES),
- A 'Fellow' of the Illuminating Engineering Society of Australia and New Zealand Limited (FIES)
- A Registered Lighting Practitioner (RLP) - Illuminating Engineering Society of Australia and New Zealand

- understand that ‘modifying’ an existing luminaire may effectively create a ‘new’ luminaire from a legal viewpoint – this means that you will likely become responsible for that luminaire’s compliance with relevant safety and electro-magnetic compatibility laws and standards
- understand the upgrade may void the warranty provided by the original luminaire manufacturer, meaning you may be considered liable should the product malfunction post-installation – the VEEC assignment form must include this information as a tick box for the customer to sign, and you should ensure that they are aware of the implications of the modification work prior to the installation taking place
- retain a record of the Certificate of Electrical Safety which Energy Safe Victoria may require for this work – this document must detail the modification work you performed on each type of linear fluorescent luminaire you modify, and specify whether the modification work includes electrical isolation of the legacy ballast, capacitor and other control gear
- retain adequate evidence of any approved power factor measurement and assessment approach used and the result of the power factor measurement – provide this to us upon request
- understand the decommissioning requirements associated with installations of LED tubes; any replaced control gear must be decommissioned and made permanently unusable.

If you feel unsure about the obligations and risks associated with installing LED tubes, seek independent technical and legal advice.

5. Record keeping and evidence requirements

You must collect evidence to verify that each upgrade has been undertaken in accordance with the VEET Regulations and VEU specifications. You are also required to maintain documentation for each upgrade and provide it to us upon request.

A summary of the evidence requirements is provided in Appendix B.

5.1. Record keeping obligations

You must keep appropriate records to verify all details of the lighting upgrade which relate to the calculation of greenhouse gas abatement and the creation of VEECs. We may ask to review these records upon request, as evidence that your upgrade complies with the legislation. Your records must be an auditable record of the work undertaken in each area of the site. If your documentation fails to provide an auditable record of the work undertaken, you may be required to surrender VEECs equivalent to those which cannot be verified.

5.2. Geo-tagged photograph obligations

You must take geo-tagged photographs to verify lighting upgrades that:

- are clear and in focus
- include any relevant markings
- include a date stamp showing the date the photographs were taken
- include the GPS derived latitude and longitude coordinates. This should be stored in the metadata and generated automatically by the device used to take the geo-tagged photographs.

5.3. Upgrades in portable buildings

Portable buildings are classified according to their use and have special compliance requirements due to their portability. They must be either permanently situated in their current location or (if not permanent) be subject to a robust compliance regime, approved by us prior to the upgrade. For non-permanent buildings, written evidence of a compliance regime which ensures adequate unique identification and tracking of the portable building structures must be approved by us prior to the upgrade.

For permanent buildings, you must provide a declaration, signed by the consumer, that the structure is permanent. The declaration must state that the building has been in its current position for at least one year before the upgrade (detailing the precise period of time, where possible) and that it will remain so for the foreseeable future.

5.4. Evidence of assignment of rights to create VEECs

You must ensure that the VEEC assignment form captures all the relevant installation information.

Table 5: Evidence of assignment of rights to create VEECs

Documentation	Description
VEEC assignment form	All fields in the VEEC assignment form must be completed and correctly filled in.

5.5. Evidence of commercial transaction and energy consumer

You must have proof of the commercial transaction relating to the installation, including evidence of the energy consumer⁷.

Table 6: Evidence of commercial transaction and energy consumer

Documentation	Description
Tax invoice	A valid tax invoice for the work carried out which must include: • the name, address and Australian Business Number (ABN) of the energy consumer • the installation address • the name, address and ABN of the installer business • an itemisation of the installed lighting equipment^{8 9} including brand(s) and model(s) names – the listed product(s) must match the Register of Products.

⁷ In accordance with Section 16(2A) of the VEET Act, the energy consumer is the person responsible for the payment of electricity for the upgraded lighting asset. In instances, where there are multiple energy consumers, a lead energy consumer must be identified. A lead energy consumer is the nominated energy consumer for the purposes of assigning rights for the VEECs created by a building based lighting upgrade activity, where multiple bodies or persons are responsible for the payment of electricity for the lighting asset to be upgraded. The onus is on the AP to provide evidence of the energy consumer.

⁸ As per VEET Regulations lighting equipment includes lamps, luminaires, lighting control devices and control gear.

⁹ Itemisation is not required for integrated lighting control devices (LCDs). A lamp with an integrated LCD is one which has lighting control capabilities according to the product specification sheet.

5.6. Evidence of space type

You must provide evidence of the space type(s) and building classification of the upgraded premises.¹⁰

Table 7: Evidence of space type

Documentation	Description
Geo-tagged photographs	You must maintain and provide to us upon request: - a geo-tagged photograph of the outside of the premises¹¹ - geo-tagged photographs clearly identifying each space type(s) upgraded.
Professionally drafted reflective ceiling plan or professionally drafted site plan	The reflective ceiling plan or site plan must clearly show: - all space types contained within the whole floor area (also indicating area/s not being upgraded) - the specific space type(s) claimed (e.g. where common areas are upgraded in a BCA Class 2 building, the applicable lighting diagram(s) must clearly show the common areas). Each part of the building upgrade must be classified separately. However, where a part has a different purpose and is not more than 10 per cent of the floor area¹² of the storey¹³ it is on, the classification applying to the major use may be applied to the whole storey. This provision does not apply when the minor use is a laboratory or part of a class 2, 3 or 4 building. Please ensure that the percentage of floor area is reflected within the reflective ceiling plan or site plan as evidence for the use of the major classification.

¹⁰ You must provide evidence of the current use/purpose of the space where the lighting upgrade is taking place.

¹¹ Portable buildings have special requirements for geo-tagged photos of the outside of the premises.

¹² Floor Area means:

1. In relation to a building: the total area of all storeys.
2. In relation to a storey: the area of all floors of that storey measured over the enclosing walls, including:
 - the area of a mezzanine within the storey, measured within the finished surfaces of any external walls
 - the area occupied by any internal walls or partitions, any cupboard, or other built-in furniture, fixture or fitting
3. if there is no enclosing wall, an area which has a use that contributes to the fire load; or impacts on the safety, health or amenity of the occupants in relation to the provisions of the BCA.
4. In relation to a room: the area of the room measured within the finished surfaces of the walls, and includes the area occupied by any cupboard or other built-in furniture, fixture or fitting.
5. In relation to a fire compartment: the total area of all floors within the fire compartment measured within the finished surfaces of the bounding construction, and if there is no bounding construction, includes an area which has a use which contributes to the fire load.
6. In relation to an atrium: the total area of all floors within the atrium measured within the finished surfaces of the bounding construction and if no bounding construction, within the external walls.

¹³ **Storey** means a space within a building which is situated between one floor level and the next floor level above, or if there is no floor above, the ceiling or roof above, but not:

- A space that only contains:
 - a lift shaft, stairway or meter room
 - a bathroom, shower room, laundry, water closet, or other sanity compartment
 - accommodation intended for more than three vehicles
 - a combination of the above.
- a mezzanine.

Documentation	Description
Additional piece of evidence for activities claimed in spaces above 4,500 annual operating hours	Refer to Appendix C: Space type evidence requirements for list of evidence to be captured per space type.

5.7. Baseline lighting configuration

You must be able to prove the existence and nature of all baseline lighting equipment.

Table 8: Baseline lighting configuration

Documentation	Description
Professionally drafted reflective ceiling plan or site plan	A reflective ceiling plan or site plan with an accompanying legend must be provided per upgrade. The diagrammatic representation and information documented must be produced to the highest standard practical¹⁴, considering the size and nature of the particular upgrade. This must include: - the number and type(s) of all baseline lighting equipment in each area of the site - the number and arrangement of any LCDs in each upgrade area, including (i) the type of LCD(s) and (ii) the group of lamps controlled by the LCD(s) - accurate dimensions of the upgrade area(s). Refer to Appendix F: Example of a professionally drafted reflective ceiling plan or site plan.

¹⁴Hand drawn site plans will not be accepted.

Documentation	Description
Geo-tagged photographs	The following geo-tagged photographs verifying the nature and configuration of all baseline lighting equipment must be provided to us upon request. These include: • geo-tagged photographs clearly identifying each upgraded space type • geo-tagged photographs of the type of baseline lighting equipment • geo-tagged photographs of each upgraded space type showing the arrangement of at least 75 per cent of the existing lighting equipment before removal from its original position¹⁵ • geo-tagged photographs of each upgraded space type showing the arrangement of at least 50 per cent of upgrade lighting equipment after installation¹⁵ • where high-bay¹⁶ products are replaced, a close-up geo-tagged photograph of at least one existing high-bay product for each upgrade space type, before removal from its original position.

5.8. Upgrade lighting configuration

You must be able to prove the nature of all upgrade lighting equipment, including its configuration.

Table 9: Upgrade lighting configuration

Documentation	Description
Professionally drafted reflective ceiling plan or site plan	A reflective ceiling plan or site plan with an accompanying legend must be provided per upgrade. The diagrammatic representation and information documented must be produced to the highest standard practical, considering the size and nature of the particular upgrade. This must include: • the number and type(s) of all upgrade lighting equipment in each area of the site • the number and arrangement of any LCDs in each upgrade area, including (i) the type of LCD(s) and (ii) the group of lamps controlled by the LCD(s) • accurate dimensions of the upgrade area(s).
Geo-tagged photographs	The following geo-tagged photographs verifying the nature and configuration of all upgrade lighting equipment must be provided to us: • geo-tagged photographs clearly identifying each upgraded space type claimed

¹⁵ Please indicate on the professionally drafted reflective ceiling plan/site plan the positions the photographs were taken from.

¹⁶ High-bay products are the following items listed in Table 34.10 of the VEU specifications: Metal halide lamp with magnetic ballast, metal halide lamp with electronic ballast, mercury vapour lamp with ballast, high pressure sodium lamp with magnetic ballast, self-ballasted mercury vapour lamp.

Documentation	Description
	• geo-tagged photographs of the type of upgrade lighting equipment.

5.9. Evidence of air conditioning

Evidence is required that the upgraded space(s) is/are air conditioned (where applicable).

Table 10: Evidence of air conditioning

Documentation	Description
Evidence verifying if the upgraded space is air conditioned	A geo-tagged photograph, clearly showing the air conditioner (or vents or outlets) for each space type upgraded must be provided.

5.10. Evidence of electrical compliance

You must ensure that all work undertaken complies with the relevant standards.

Table 11: Evidence of electrical compliance

Documentation	Description
Certificate of Electrical Safety (COES)	A COES must be provided if one is required by law. The certificate must include:¹⁷ • the address of the lighting upgrade • the type and number of baseline lighting equipment • the type and number of upgrade lighting equipment. Where a luminaire has been modified¹⁸, the COES must: • comply with Energy Safe Victoria's requirements • define the modification work for each type of linear fluorescent luminaire you modify • specify that the modification work includes electrical isolation of the legacy ballast (and removal and destruction of the capacitor if one was present).

¹⁷ An appendix may be provided with a COES where there is insufficient space in the 'description of work undertaken' box to provide an accurate description of all the electrical installation work performed. Where an appendix is used with a COES the following criteria must be fulfilled: (i) each page of the attachment must detail the COES number (ii) the number of pages contained within the attachment must be detailed on the COES and (iii) the COES and each page of the attachment must be signed by the electrician responsible for the lighting upgrade.

¹⁸ These are for upgrades where the existing linear fluorescent lamp is replaced with a linear LED lamp, the original starter is replaced with a fuse as supplied with the LED lamp (in accordance with instructions provided with the LED lamp), and the original fluorescent lamp control gear – including both the ballast and capacitor where fitted – is rendered inoperable by removal and destruction of the whole item (or, in the case of the ballast only, by removal and destruction of the terminal block). In instances where the ballast is left in-situ and decommissioned by removal and destruction of the terminal block; if a capacitor is fitted, the capacitor must be removed and destroyed.

5.11. Evidence of decommissioning and recycling of lighting equipment

All existing lighting equipment must be decommissioned and recycled in accordance with the VEET Regulations and EPA requirements¹⁹.

Table 12: Evidence of decommissioning and recycling

Documentation	Description
Recycling invoice	The following documents must be provided prior to certificate creation: • A third-party recycling invoice per upgrade site clearly showing: – an itemised breakdown of the disposed baseline lighting equipment (showing the lamp type, type of control gear and type of fitting/luminaire)²⁰ – the date of collection. OR • A third-party bulk recycling invoice (for multiple upgrade sites) clearly showing: – an itemised breakdown of the disposed baseline lighting equipment (showing the lamp type, type of control gear and type of fitting/luminaire) – the date of collection. The bulk recycling invoice must be accompanied by a document itemising the disposed baseline lighting equipment in kilograms per upgrade site to establish a link between each upgrade and the recycling invoice.
Geo-tagged photographs	The following photographs must be provided to us: • for all installations, geo-tagged photographs of all removed lighting equipment in a pile or in a recycling container • for linear LED tube modification installations: – geo-tagged photographs of removed capacitors – geo-tagged photographs of the ballast/transformer showing the terminal block removed or the removed terminal blocks.²¹

¹⁹ From 1 July 2019, EPA requires that all e-waste in Victoria must be provided to an e-waste service provider. Please refer to section 4.2.2 for further information.

²⁰ Where an itemised breakdown is not provided on the invoice, you must provide a document itemising the disposed baseline lighting equipment in kilograms for that site.

²¹ Ballast/transformers and capacitors (where fitted) must be 'rendered permanently unusable' to qualify for decommissioning. If it is possible to reverse any modifications made to the legacy control gear as part of the lighting upgrade, then it does not qualify as decommissioned. Acceptable methods of decommissioning the ballast/choke include:

- complete removal of all redundant electrical components, inclusive of the ballast and capacitor (where fitted)removal, or
- destruction of the ballast terminal block and capacitor (where fitted).

5.12. Evidence of AS/NZS 1680 compliance

You must demonstrate that the lighting upgrade achieves the minimum illuminance levels and recommended maintained illuminance levels specified in the relevant part of AS/NZS 1680.

Table 13: Evidence of AS/NZS 1680 compliance

Documentation	Description
AS/NZS 1680 compliance declaration	A completed AS/NZS 1680 compliance declaration based on the template provided on the commission website.
Lighting design software output report or lux report	For upgrades of 100 VEECs or more, APs need to provide the following documentation: • If a lighting design software has been used: – lighting software output report – photometric data for lamps (showing lumen depreciation). • If no lighting design is undertaken: – lux report – photometric data for lamps (showing lumen depreciation). Above documentation is optional for upgrades of less than 100 VEECs.

5.13. Evidence of AS/NZS 1680 compliance exemption (if applicable)

Before undertaking the lighting upgrade you have to apply to us for a determination that the lighting upgrade is not required to achieve the minimum illuminance or recommended maintained illuminance specified in the relevant part of AS/NZS 1680.

Table 14: Evidence of AS/NZS 1680 compliance exemption (if applicable)

Documentation	Description
AS/NZS 1680 exemption report	AS/NZS 1680 exemption report signed by a qualified lighting designer²² outlining the following: • the rationale for seeking an exemption to AS/NZS 1680 • the proposed alternative standard • evidence that the proposed standard is equivalent to the intent of the principal standard and appropriate for the installation environment (where relevant) • an output report of the lighting design software with photometric data and lumen depreciation data for lamps • detail of the minimum or maintained illuminance (lux) levels for each area of the

²² A qualified lighting designer holds one of the following qualifications:

- 'Member' of the Illuminating Engineering Society of Australia and New Zealand Limited (MIES)
- 'Fellow' of the Illuminating Engineering Society of Australia and New Zealand Limited (FIES)
- Registered Lighting Practitioner (RLP) - Illuminating Engineering Society of Australia and New Zealand.

Documentation	Description
	lighting upgrade • additional requirements relevant to the lighting upgrade (e.g. light level depreciation, glare, uniformity of illuminance, recommended maintenance regime - where relevant).

6. Building based lighting upgrade process

This section provides you with the process for undertaking a building based lighting upgrade under the program.

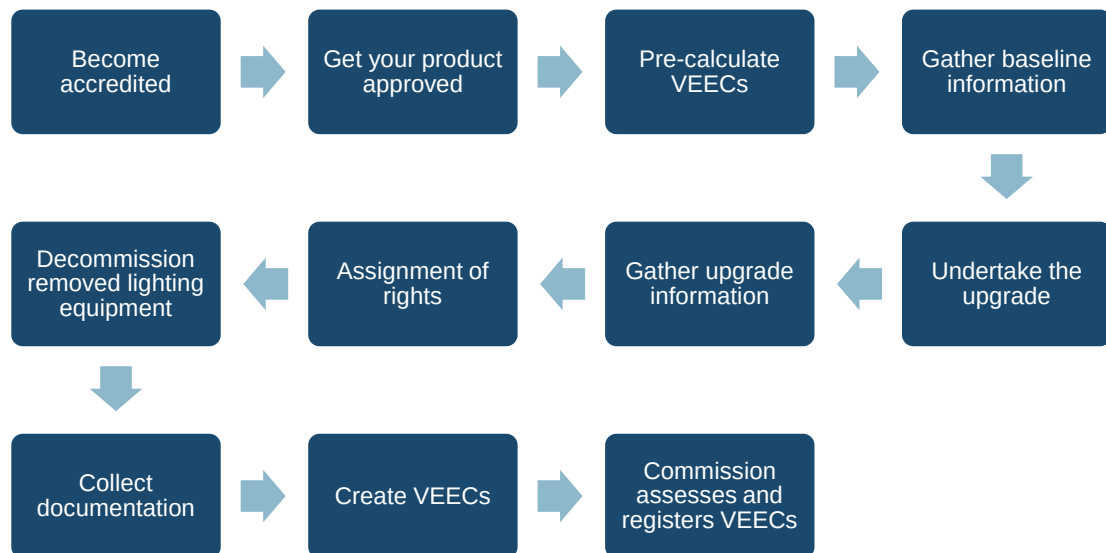


Figure 3: Process for undertaking building based lighting upgrade

6.1. Become accredited

You must be accredited to create VEECs, Visit www.esc.vic.gov.au/become-veu-accredited for information on how to become accredited.

6.2. Get your product approved

To create VEECs for any lighting upgrade, the product installed must be listed as an approved product on our Register of Products.

Learn more about getting your lighting products approved in our Lighting Product Application Guide at www.esc.vic.gov.au/veu-product-applicants

6.3. Pre-calculate VEECs

To quote for a job or develop a business case, you may need to estimate the number of VEECs an upgrade will generate. You can use the calculator at www.veu-registry.vic.gov.au/calculators for calculating single baseline and upgrade scenario.

You will need to enter information relating to both the baseline and the upgrade zones. The type of upgrade you are undertaking (based on asset lifetime reference) determines the data you will need to enter – there will be some fields which must be left blank. To assist you in using the calculator,

Figure 4 and Figure 5 detail the data you'll need to enter into our calculator based on the upgrade type.

	Baseline							
Asset lifetime reference:	Luminaire replacement	Modification	Retrofit	Delamping	Lighting control device	Luminaire decommissioning	New installation	Other
Baseline: Space type								
Baseline: BCA classification								
Baseline: Area of space								
Baseline: Asset lifetime reference								
Baseline: Rated lifetime hours			Upgrade lamp					Baseline lamp
Baseline: Type of first LCD								
Baseline: Type of second LCD								
Baseline: VRU voltage								
Baseline: HVAC A/C?								

	Upgrade							
Asset lifetime reference:	Luminaire replacement	Modification	Retrofit	Delamping	Lighting control device		New installation	Other
Upgrade: Lamp ballast combination								
Upgrade: Quantity								
Upgrade: Asset lifetime reference								
Upgrade: Rated lifetime hours								Baseline lamp
Upgrade: Nominal lamp power								
Upgrade: Lamp circuit power								
Upgrade: Type of first LCD								
Upgrade: Type of second LCD								
Upgrade: VRU voltage								
Upgrade: HVAC A/C?								
Postcode								

Key

	Do <u>not</u> enter data into this cell
	You <u>must</u> enter data in this cell
	Inputs optional

(RM ref: C/18/24126)

Figure 4: VEEC calculator - Variable data requirements for J6 scenarios

Baseline							
Asset lifetime reference:	Luminaire replacement	Modification	Retrofit	Delamping	Lighting control device	Luminaire decommissioning	Other
Baseline: Space type							
Baseline: Lamp ballast combination							
Baseline: Quantity							
Baseline: Asset lifetime reference							
Baseline: Rated lifetime hours			Upgrade lamp				Baseline lamp
Baseline: Nominal lamp power							
Baseline: Type of first LCD							
Baseline: Type of second LCD							
Baseline: VRU voltage							
Baseline: HVAC A/C?							
Upgrade							
Asset lifetime reference:	Luminaire replacement	Modification	Retrofit	Delamping	Lighting control device		Other
Upgrade: Lamp ballast combination							
Upgrade: Quantity							
Upgrade: Asset lifetime reference							
Upgrade: Rated lifetime hours							Baseline lamp
Upgrade: Nominal lamp power							
Upgrade: Lamp circuit power							
Upgrade: Type of first LCD							
Upgrade: Type of second LCD							
Upgrade: VRU voltage							
Upgrade: HVAC A/C?							
Postcode							
Key		Do <u>not</u> enter data into this cell					
		You <u>must</u> enter data in this cell					
		Inputs optional					

(RM ref: C/18/24126)

Figure 5: VEEC calculator - Variable data requirements for Non-J6 scenarios

When selecting the 'lamp ballast combination' for the upgrade zone of a particular activity, the entry must align with the lamp product type of the installed product (as recorded in our Register of Products). See Appendix E: Lamp ballast combination for guidance on this issue.

You can also upload details of an upgrade activity using the VEEC upload form, to help you determine how many VEECs can be created for a given activity. This is particularly useful for calculating complex installations (those involving more than one baseline and upgrade zone). You can delete uploaded activities from your activity queue. You must not 'submit' an uploaded activity for creation unless the activity has been validly undertaken. See Section 6.8 for help in completing a VEEC upload form.

6.4. Gather baseline information

Verify the baseline environment by collecting any necessary baseline data you need for certificate creation prior to performing the upgrade. Evidence requirements are outlined in Section 5.

6.5. Undertake the upgrade and gather information

Ensure you comply with relevant other legislation, such as OHS, while performing the upgrade, and that you collect all evidence requirements. Evidence requirements are outlined in Section 5.

6.6. Assignment of rights

An important part of the certificate creation process is the valid assignment of the right to create VEECs from the consumer to you. Ensure the signatory has the legal authority to sign on behalf of the consumer entity.

6.7. Decommission and recycle removed lighting equipment

Lighting equipment that is replaced or removed must be decommissioned and disposed of in an accordance with the VEET Regulations (see Section 4.2). See Section 5.11 for record keeping requirements.

6.8. Collect documentation and create VEECs online

Prior to creating VEECs for an activity, ensure you have collected the required documents for the upgrade as specified in Section 5. You may be asked to submit some or all of these documents as part of our assesment process.

To create VEECs for this activity, you can upload the activity using either a bulk upload form or the online user interface on the VEU Registry. Different upgrade types have different data input requirements. The user interface has been designed to accommodate all upgrade types, so it is important you input the correct data in the relevant field – you must also leave some fields blank.

Figure 6 shows the user interface for activity 34 through a series of screenshots. Figure 7 and Figure 8 outline the data inputs required for the various J6 and Non-J6 upgrade types. The LCD fields should only be completed if a lighting control device was present in the baseline environment, or installed as part of an upgrade. The VRU fields should only be completed if a voltage reduction unit is installed as part of the upgrade.

When selecting the 'lamp ballast combination' for the upgrade zone of a particular activity, the entry must align with the lamp product type of the installed product (as recorded in our Register of Products). See Appendix E: Lamp ballast combination for guidance on this issue.

Tabs system

The user interface is divided into two tabs The ‘Detail’ tab collects high level information about the upgrade and the ‘Calculations’ tab collects the data required to perform the abatement calculations. Navigate between them using the tab names as marked below.

Detail tab

Activity Date: 13-Jul-2016
Sector: Business
Activity: 34.26 - Lighting Upgrade - Business

Own Reference
Brief Description of the Upgrade
Upgrade Commencement Date
Activity Date
Building approval reference number
Building approval certifying authority
Business/Company Name
ABN / ACN
Industry/Business Type
Number of Levels
Floor Space (m2)
Floor Space Upgraded Area (m2)
Unit Type
Unit Number
Level Type
Level Number
Street Number
Street Name
Street Type
Street Type Suffix
Town / Suburb
State
Postcode
Authorised Signatory First Name
Authorised Signatory Last Name
Authorised Signatory Phone Number
Contractual Arrangements (who undertook work)
Contractual details (if other)
1680 - Lighting design method
1680 - Qualifications of lighting designer
1680 - Designer qualification details
1680 - Light level verification
1680 - Qualifications of light level verifier
1680 - Verifier qualification details
Certificate of Electrical Compliance Number
Electrician Licence Number
Upgrade Manager Company Name
Upgrade Manager First Name
Upgrade Manager Last Name
Upgrade Manager Phone Number
Unrecognised Address Justification
Internal Duplicate Justification
External Duplicate Justification

J6 calculations tab

The calculations tab contains a grid designed to accommodate the data requirements of a range of upgrade scenarios.

	A: Area Name	B: Space Type	C: BCA Classification	D: Baseline/ Upgrade	E: Area of Calc Zone	F: Lamp Ballast Combination	G: Quantity	H: Asset Lifetime Reference	I: Product Brand	J: Product Model	K: Rated Lifetime Hours	L: Nominal Lamp Power	M: Integrated LCD Activated?	N: First LCD Type	O: Second LCD Type	P: VRU Product Brand	Q: VRU Product Model	R: HVAC A/C?
Calc Zone 01																		
Calc Zone 02																		
Calc Zone 03																		
Calc Zone 04																		

Non-J6 calculations tab

The calculation tabs for J6 and Non-J6 vary a little due to differences in the data requirements for each variation of the activity.

	A: Area Name	B: Space Type	C: Baseline/ Upgrade	D: Lamp Ballast Combination	E: Quantity	F: Asset Lifetime Reference	G: Product Brand	H: Product Model	I: Rated Lifetime Hours	J: Nominal Lamp Power	K: Integrated LCD Activated?	L: First LCD Type	M: Second LCD Type	N: VRU Product Brand	O: VRU Product Model	P: HVAC A/C?
Calc Zone 01																
Calc Zone 02																
Calc Zone 03																
Calc Zone 04																

Maximum of 50 calculation zones

The user interface and upload form can accommodate up to 50 calculation zones.

Figure 6: Activity 34 user interface

36 scenarios																		
#	Asset lifetime reference	Space type	BCA classification	Baseline/ Upgrade	Area calculation zone	Lamp ballast combination	Quantity	Asset lifetime reference	Product brand	Product model	Integrated LCD activated?	Rated lifetime hours	Nominal lamp power	First LCD type	Second LCD type	VRU product brand	VRU product model	HVAC/ AC?
1	Luminaire replacement			Baseline														
2	Modification			Baseline														
3	Retrofit			Baseline								Upgrade lamp						
4	Delamping			Baseline														
5	Lighting control device			Baseline														
6	Luminaire decommissioning			Baseline														
7	New installation			Baseline														
8	Other			Baseline								Baseline lamp						
9	Luminaire replacement			Upgrade														
10	Modification			Upgrade														
11	Retrofit			Upgrade														
12	Delamping			Upgrade														
13	Lighting control device			Upgrade														
14	New installation			Upgrade														
15	Other			Upgrade								Baseline lamp						

Key

Do not enter data into this cell

You must enter data in this cell

Inputs optional

(RM ref: C/18/24126)

Figure 7: VEEC creation form - Variable data requirements for J6 scenarios

Non J6 scenarios

#	Asset lifetime reference
1	Luminaire replacement
2	Modification
3	Retrofit
4	Delamping
5	Lighting control device
6	Luminaire decommissioning
7	Other
8	Luminaire replacement
9	Modification
10	Retrofit
11	Delamping
12	Lighting control device
14	Other

Space type	Baseline/ Upgrade	Lamp ballast combination	Quantity	Asset lifetime reference	Product brand	Product model	Integrated LCD activated	Rated lifetime hours	Nominal lamp power	First LCD type	Second LCD type	VRU product brand	VRU product model	HVAC/ AC?
	Baseline													
	Baseline													
	Baseline							Upgrade lamp						
	Baseline													
	Baseline													
	Baseline													
	Baseline							Baseline lamp						
	Upgrade													
	Upgrade													
	Upgrade													
	Upgrade													
	Upgrade													
	Upgrade													
	Upgrade													
	Upgrade							Baseline lamp						

Key

Do not enter data into this cell

You must enter data in this cell

Inputs optional

(RM ref: C/18/24126)

Figure 8: VEEC creation form - Variable data requirements for Non-J6 scenarios

6.9. Commission assesses VEEC creation claims

Before you create VEECs for a building based lighting upgrade, the creation data you submit must first pass preliminary validation and address verification checks.

After you press the 'create' button for your validated activities, the VEECs associated with your upgrade are created and assigned a unique identifier. We then assess your created VEECs and decide whether to register them.

If you are new to the building based lighting activity, your certificate creation claims will begin as a 'stage 1' stream. In this stage, we will request you submit the documentation associated with your first few upgrades. Once we are satisfied with the quality and reliability of your activity documentation, we will move your creation claims to a 'stage 2' stream and you will no longer have to submit documentation for each upgrade in order to have your VEECs assessed and registered.

For creation claims in the stage 2 stream, instead of performing desk audits on every upgrade, we use a risk analytics tool to monitor and highlight risk factors in your creation data. We update our risk analytics tool based on trends in the program, information about you and your installers, data on specific types of product, and other factors. All stage 2 stream VEEC creations are subject to this process, allowing us to focus our assessment on higher risk creations.

We may still request you submit documentation for a particular upgrade. Regardless, you must always retain complete and accurate documentation for each upgrade you have undertaken.

6.10. Commission registers VEECs

Once your VEEC creation claims have been validated, we will provide you with an invoice for the certificate registration fee of \$1 per certificate. Once payment is received, we will register your VEECs and notify you that the VEECs are available to be traded and/or surrendered to us.

Glossary

Term	Definition
Air conditioned	Air conditioned for the purpose of determining the AM for this activity means a service that actively cools or heats the air within a space, but does not include a service that directly maintains specialised conditions for equipment, processes or products, where this is the main purpose of the service.
AS/NZS 1680 compliance declaration	A document declaring that the lighting upgrade meets the applicable installation and performance requirements of AS/NZS 1680.
Ballast	Ballast means a unit inserted between the electricity supply and one or more discharge lamps which, by means of inductance, capacitance, or a combination of inductance and capacitance, serves mainly to limit the current of lamp(s) to the required value. The ballast may consist of one or more separate components. It may also include means for transforming the supply and voltage, and arrangements which help provide the starting voltage, preheating current, prevent cold starting, reduce stroboscopic effects, correct the power factor and/or suppress radio interference.
BCA	BCA means the Building Code as defined below.
Building Code	Building Code means the Building Code of Australia within the meaning of Section 3(1) of the Building Act 1993.
Capacitor	Capacitor means a two-terminal circuit device characterised by its capacitance, which is used in circuitry for the operation and power factor correction of gas discharge lamps.
Control gear	Control gear means a device for the control of one or more light sources but does not include a lighting control device. Examples: Ballasts, transformers, capacitors and step-down converters such as drivers.
Decommission	Decommission means disable and render permanently unusable.
Electronic ballast	Electronic ballast means a mains-supplied AC to DC inverter for starting and operating one or more light sources generally at a high frequency.
Energy consumer	Energy consumer, in relation to a prescribed activity, means the person who is the consumer of electricity or gas in respect of whom a prescribed activity is undertaken within the meaning of Section 16 of the Victorian Energy Efficiency Target Act 2007.
High pressure sodium lamp	High pressure sodium lamp means a discharge lamp classified as a high-pressure sodium vapour lamp as defined by IEC 60662.
Illuminance	Illuminance means the amount of light that falls on a surface per unit area (measured in lux).
IPD	IPD means the maximum power density in watts/metres squared.

Lamp circuit power (LCP)	LCP means the lamp circuit power for a light source.
LED	LED means light emitting diode.
Legacy control gear	Legacy control gear means the control gear that was used to operate any lighting components that were present prior to an upgrade being carried out pursuant to the Victorian Energy Efficiency Target Regulations 2018.
Licensed electrician	Licensed electrician means an A Grade electrician licensed under the Electricity Safety Act 1998 to carry out electrical work.
Lighting control device (LCD)	Lighting control device means a device that is used to control the light output of a luminaire. Examples: occupancy sensors, daylight-linked controls, programmable dimmers, manual dimmers and voltage reduction units.
Lighting equipment	Lighting equipment includes: • lamps • luminaires • lighting control devices • control gear.
Linear fluorescent lamp	Linear fluorescent lamp means a fluorescent lamp that has two separate caps and is of linear shape.
Luminaire	Luminaire means a non-integrated luminaire or a LED integrated luminaire.
Manual dimmer	Manual dimmer means a lighting control device that allows a user to manually control a luminaire's output using a readily accessible knob, slider or other mechanism.
Maintained emergency lighting	Maintained emergency lighting means an exit sign or always-on maintained emergency luminaire as defined in AS 2293.1.
Mercury vapour lamp	Mercury vapour lamp means a discharge lamp classified as a high-pressure mercury vapour lamp as defined by IEC 60188.
Metal halide lamp	Metal halide lamp means a discharge lamp classified as a metal halide lamp as defined by IEC 61167.
Nominal lamp power (NLP)	Nominal lamp power (NLP) means the manufacturer's rated value for power drawn by a light source (in Watts).
Occupancy sensor	Occupancy sensor means a lighting control device that uses a motion sensor to detect the presence of people in a space and adjusts the output of a luminaire in that space accordingly.
Programmable dimmer	Programmable dimmer means a lighting control device that can automatically select a luminaire's light output according to the time of day.

Scheduled activity premises	Scheduled activity premises means the following: • the premises at the addresses specified in column 2 of the Table in Part 1 of Schedule 5 of the VEET Regulations • the premises specified in column 2 of the Table in Part 2 of Schedule 5 of the VEET Regulations • any other premises in relation to which there was, on 29 June 2014, an entry on the register of scheduled activities kept under Section 26G of the Environment Protection Act 1970 as in force immediately before that day.
Self-ballasted mercury vapour lamp	Self-ballasted mercury vapour lamp means a lamp that contains, in the same envelope, a mercury vapour lamp and an incandescent lamp filament connected in series.
T5 adaptor	T5 adaptor is a product that enables a luminaire that houses a T8 or T12 lamp to use a T5 lamp.
VEEC	A Victorian energy efficiency certificate created under Section 17 of the Victorian Energy Efficiency Target Act 2007.
Voltage reduction unit	Voltage reduction unit means a lighting control device that reduces the voltage applied to a luminaire after the luminaire is switched on but does not include a product that adjusts the supply voltage to any premises to a specific bandwidth.

Appendix A: Table of relevant standards in the AS/NZS 1680 series

Relevant part of AS/NZS 1680 standard	Title
AS/NZS 1680 series: Interior and workplace lighting published by Standards Australia comprising—	
AS/NZS 1680.0:2009	Interior lighting—Part 0: Safe movement
AS/NZS 1680.1:2006	Interior and workplace lighting—Part 1: General principles and recommendations
AS/NZS 1680.2.1:2008	Interior and workplace lighting—Part 2.1: Specific applications—Circulation spaces and other general areas
AS/NZS 1680.2.2:2008	Interior and workplace lighting—Part 2.2: Specific applications—Office and screen-based tasks
AS/NZS 1680.2.3:2008	Interior and workplace lighting—Part 2.3: Specific applications—Educational and training facilities
AS/NZS 1680.2.4:2017	Interior and workplace lighting—Part 2.4: Industrial tasks and processes
AS/NZS 1680.2.5:2018	Interior and workplace lighting—Part 2.5: Hospital and medical tasks
AS/NZS 1680.3:2017	Interior and workplace lighting—Part 3: Measurement, calculation and presentation of photometric data
AS/NZS 1680.4:2017	Interior and workplace lighting—Part 4: Maintenance of electric lighting systems

Appendix B: Evidence checklist

Evidence type	Document	Description
Evidence of assignment of right to create VEECs	VEEC assignment form	A completed and signed VEEC assignment form.
Evidence of commercial transaction and energy consumer	Tax invoice	A valid tax invoice for the work carried out.
Evidence of space type	Geo-tagged photographs	• Geo-tagged photographs of the outside of the premises • Geo-tagged photographs identifying each upgraded space type
	Reflective ceiling plan (RCP) or drafted site plan	A professionally drafted RCP or site plan showing all space types of the upgrade area.
	Additional piece of evidence for activities claimed in spaces above 4,500 annual operating hours	Refer to Appendix C: Space type evidence requirements.
Evidence of baseline lighting configuration	Reflective ceiling plan (RCP) or drafted site plan	A professionally drafted RCP or site plan with an accompanying legend pre upgrade.
	Geo-tagged photographs	Geo-tagged photographs verifying the nature and configuration of pre-existing lighting equipment.
Evidence of upgrade lighting configuration	Reflective ceiling plan or drafted site plan	A professionally drafted reflective ceiling plan or site plan with an accompanying legend post upgrade.
	Geo-tagged photographs	Geo-tagged photographs verifying the nature and configuration of any new lighting equipment.

Evidence type	Document	Description
Evidence of air-conditioning	Geo-tagged photograph	• A geo-tagged photograph of the air-conditioner, or • A HVAC plan of the upgrade site.
Evidence of electrical compliance	Certificate of Electrical Safety (COES)	A completed and signed COES if one is required by law.
Evidence of decommissioning	Third-party recycling invoices	• A third-party recycling invoices specific to the upgrade activity, or • A third-party bulk recycling invoices accompanied by a reconciliation list.
	Geo-tagged photographs	• Geo-tagged photographs of the existing ballast/transformer (if applicable) • Geo-tagged photographs of all removed lamps and control gear • Geo-tagged photographs of the removed capacitors (if applicable).
Evidence of AS/NZS 1680 compliance	AS/NZS 1680 compliance declaration	A completed and signed AS/NZS 1680 compliance declaration.
	Lighting design software output report or lux report	• An output report of the lighting design software with photometric data and lumen depreciation data for lamps, or • A lux report with photometric data and lumen depreciation data for lamps (as required).
Evidence of AS/NZS 1680 compliance exemption (where applicable)	AS/NZS 1680 exemption report	Refer to Section 5.13 for detailed requirements.

Appendix C: Space type evidence requirements

Table 15: Space type evidentiary requirements

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Auditorium, church and public hall	2,000	10	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s)
Board room and conference room	3,000	10	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s)
Car park - entry zone (first 20m of travel)	7,000	25	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s) - One of the following: - Regulatory or contractual documentation which verifies the space type - Any other third-party documentation which verifies the building classification, as deemed acceptable by us²⁴.

²³ Further guidance about space types is available in the BCA Guides located at www.abcb.gov.au

²⁴ We will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the BCA.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Carpark - general (undercover)	7,000	6	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s) - One of the following: - Regulatory or contractual documentation which verifies the space type - Any other third-party documentation which verifies the building classification, as deemed acceptable by us²⁵.
Common rooms, spaces and corridors in a Class 2 building	7,000	8	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear reference to the space type - One of the following: - Regulatory or contractual documentation which verifies the space type - Any other third-party documentation which verifies the space type, as deemed acceptable by us²⁶.
Control room, switch room and the like in a Class 2 building	Value as per BCA classification of the space	9	Refer to Table 16.
Corridors	Value as per BCA classification of the space	8	Refer to Table 16.

²⁵ We will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the BCA.

²⁶ See preceding note.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Courtroom	2,000	12	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Dormitory of a Class 3 building used for sleeping only	3,000	6	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Dormitory of a Class 3 building used for sleeping and study	3,000	9	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Entry lobby from outside building	Value as per BCA classification of the space	15	Refer to Table 16.
Health care ²⁷ - children's ward, examination room	6,000	10	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Health care ²⁹ - patient ward, all patient care areas including corridors where cyanosis lamps are used	6,000	7	- One of the following: - Regulatory or contractual documentation which verifies the space type - Public health care building: copy of the public health care facilities list published by the Victorian Health Department in its website showing the facility subject to the upgrade.

²⁷ Health care buildings are distinguished from doctor or dentist surgeries.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Health care ³⁰ - all patient care areas including corridors where cyanosis lamps are used	6,000	13	- Private health care building: evidence of the facility being licensed to operate under the Health Services Act 1988 and the Health Services (Private Hospitals and Day Procedure Centres) Regulations 2013 (or as changed from time to time), or - Any other third-party documentation which verifies the space type, as deemed acceptable by us²⁸.
Kitchen and food preparation area	Value as per BCA classification of the space	8	Refer to Table 16.
Laboratory area - artificially lit to an ambient level of 400 lx or more	3,000	12	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Library - stack and shelving area, reading room and general areas	3,000	12	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).
Library - reading room and general areas	3,000	10	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s).

²⁹ Health care buildings are distinguished from doctor or dentist surgeries.

³⁰ Health care buildings are distinguished from doctor or dentist surgeries.

²⁸ We will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the BCA.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Lounge area for communal use in a Class 3 building or Class 9c aged care building	7,000	10	For Class 3 buildings: • At least one geo-tagged photograph of each space type that clearly verifies the space type • Upgrade schematic and legend with clear references to the space type(s) • One of the following: – Regulatory or contractual operating licence which verifies the space type of the building – Annual essential safety measures report – Any other third-party documentation which verifies the space type, as deemed acceptable by us³¹. For Class 9c buildings: • At least one geo-tagged photograph of each space type that clearly verifies the space type, • Upgrade schematic and legend with clear references to the space type(s) • One of the following: – Regulatory or contractual documentation which verifies the space type – For accommodation facilities for the aged, children or people with disabilities, funded by the government, a copy of the Department of Social Services published list of low-level care facilities, in which the facility subject to the upgrade is listed – For non-government funded care facilities (e.g. retirement villages), evidence that the land is registered to be used as a retirement village obtained through the Fair Trading website – Any other third-party documentation which verifies the space type, as deemed acceptable by us³².

³¹ See preceding note.

³² See preceding note.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Maintained emergency lighting	8,500	1	- At least one geo-tagged photograph of each space type that clearly verifies the space type, - Upgrade schematic and legend with clear references to the space type and emergency light(s), and - One of the following: - Electric lighting design (compliant with AS 2293.1), or - Document showing statutory legal requirements for safety or of the related purpose³³.
Museum and gallery - circulation, cleaning and service lighting	2,000	8	- At least one geo-tagged photograph of each space type that clearly verifies the space type, and - Upgrade schematic and legend with clear references to the space type(s).
Office – artificially lit to an ambient level of 200 lx or more	3,000	9	- At least one geo-tagged photograph of each space type that clearly verifies the space type, and - Upgrade schematic and legend with clear references to the space type(s).
Office – artificially lit to an ambient level of less than 200 lx	3,000	7	- At least one geo-tagged photograph of each space type that clearly verifies the space type, and - Upgrade schematic and legend with clear references to the space type(s).
Plant room	Value as per BCA classification of the space		Refer to Table 16.

³³ Only independent third-party documentation from a body qualified to inspect maintained emergency lighting will be accepted as evidence.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
A space for the serving and consumption of food or drinks (Division H) ³⁴	5,000	18	• At least one geo-tagged photograph of each space type that clearly verifies the space type • Upgrade schematic and legend with clear references to the space type(s) • One of the following: – Regulatory or contractual operating licence which verifies the space type of the building (where applicable) – Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) – Web page printouts (applicable for upgrades > 200 VEECs) including the official web page address, showing the service provided and the premises address – Annual essential safety measures report – Any other third-party documentation which verifies the space type, as deemed acceptable by us.
A space for the serving and consumption of food or drinks (Division R) ³⁵	2,000	18	• At least one geo-tagged photograph of each space type that clearly verifies the space type • Upgrade schematic and legend with clear references to the space type(s).

³⁴ A space for the serving and consumption of food or drinks to the public that fall under Division H – Accommodation and food services as defined in the Australian and New Zealand Standard Industrial Classification. Note: Excludes all operations that fall under class 4513 (catering services).

³⁵ A space for the serving and consumption of food or drinks to the public that also fall under Division R – Arts and Recreation Services as defined in the Australian and New Zealand Standard Industrial Classification.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Retail space including a museum and gallery whose purpose is the sale of objects	5,000	22	• At least one geo-tagged photograph of each space type that clearly verifies the space type • Upgrade schematic and legend with clear references to the space type(s) • One of the following: – Regulatory or contractual documentation which verifies the space type – Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) – Web page printouts (applicable for upgrades > 200 VEECs) including the official web page address, showing the service provided and the premises address – Annual essential safety measures report – Any other third-party documentation which verifies the space type, as deemed acceptable by us³⁶.
School - general purpose learning areas and tutorial rooms	3,000	8	• At least one geo-tagged photograph of each space type that clearly verifies the space type, and • Upgrade schematic and legend with clear references to the space type(s).
Sole-occupancy unit of a Class 3 building	3,000	5	• At least one geo-tagged photograph of each space type that clearly verifies the space type • Upgrade schematic and legend with clear references to the space type(s).

³⁶ See preceding note.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Sole-occupancy unit of a Class 9c aged care building	6,000	7	- At least one geo-tagged photograph of each space type that clearly verifies the space type, - Upgrade schematic and legend with clear references to the space type(s) - One of the following: - For accommodation facilities for the aged, children or people with disabilities, funded by the government, a copy of the Department of Social Services published list of low-level care facilities, in which the facility subject to the upgrade is listed - For non-government funded care facilities (e.g. retirement villages), evidence that the land is registered to be used as a retirement village obtained through the Fair Trading website.
Storage with shelving no higher than 75 per cent of the height of the aisle lighting	Value as per BCA classification of the space	8	Refer to Table 16.
Storage with shelving higher than 75 per cent of the height of the aisle lighting or wholesale storage and display area	Value as per BCA classification of the space	10	Refer to Table 16.
Service area, cleaner's room and the like	Value as per BCA classification of the space	5	Refer to Table 16.
Toilet, locker room, staff room, rest room and the like	Value as per BCA classification of the space	6	Refer to Table 16.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Health and fitness centres and gymnasias operations ³⁷	5,100	10	- At least one geo-tagged photograph of each space type that clearly verifies the space type - Upgrade schematic and legend with clear references to the space type(s) - One of the following: - Regulatory or contractual documentation which verifies the space type - Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) - Web page printouts (applicable for upgrades > 200 VEECs) including the official web page address, showing the service provided and the premises address - Any other third-party documentation which verifies the space type, as deemed acceptable by us.
Unlisted space type	Value as per BCA classification of the space		Refer to Table 16.
Unlisted space type with illuminance of not more than 80 lx (J6 projects only)	Value as per BCA classification of the space	7.5	Refer to Table 16.

³⁷ Health and fitness centres and gymnasias operations, classified as Division R (9111) in the Australian and New Zealand Standard Industrial Classification. This only includes health and fitness centres and gymnasias operations that are membership based and whose membership's primary purpose is to frequent these operations.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Unlisted space type with illuminance between 81 lx and 160 lx (J6 projects only)	Value as per BCA classification of the space	9	Refer to Table 16.
Unlisted space type with illuminance between 161 lx and 240 lx (J6 projects only)	Value as per BCA classification of the space	10	Refer to Table 16.
Unlisted space type with illuminance between 241 lx and 320 lx (J6 projects only)	Value as per BCA classification of the space	11	Refer to Table 16.
Unlisted space type with illuminance between 321 lx and 400 lx (J6 projects only)	Value as per BCA classification of the space	12	Refer to Table 16.
Unlisted space type with illuminance between 401 lx and 480 lx (J6 projects only)	Value as per BCA classification of the space	13	Refer to Table 16.

Space types ²³	Annual operating hours (AOH)	IPD	Evidentiary requirements for space type verification
Unlisted space type with illuminance between 481 lx and 540 lx (J6 projects only)	Value as per BCA classification of the space	14	Refer to Table 16.
Unlisted space type with illuminance between 541 lx and 620 lx (J6 projects only)	Value as per BCA classification of the space	15	Refer to Table 16.

Table 16: BCA building classification evidence requirements

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 2 buildings (common areas)	7,000	Common areas ³⁸ of a residential building, which is a building containing two or more sole-occupancy units ³⁹ each being separated by a dwelling.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear reference to the building classification • One of the following: – Regulatory or contractual documentation which verifies the building classification – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁴⁰.

³⁸ **Common areas** means for buildings:

- (a) owned under strata title, the common property as defined in the *Owners Corporation Act 2006* (VIC), or
- (b) not owned under strata title (e.g. under company title), the non-residential property of BCA Class 2 buildings.

³⁹ **Sole-occupancy unit** means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes:

- (a) a dwelling, or
- (b) a room or suite of rooms in a Class 3 building which includes sleeping facilities, or
- (c) a room or suite of associated rooms in a Class 5,6,7,8 or 9 building, or
- (d) a room or suite of associated rooms in a class 9c *aged care building*, which includes sleeping facilities and any area for the exclusive use of a resident.

⁴⁰ We will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the Building Code of Australia (BCA).

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 3 buildings (common areas)	7,000	Common areas of a residential building, other than buildings of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including: - a boarding house, guest house, hostel, lodging house or backpackers accommodation - a residential part of a hotel or motel, or - a residential part of a school⁴¹ - accommodation for the aged, children or people with disabilities - a residential part of a health care building⁴² which accommodates members of staff, or a residential part of a detention centre⁴³.	- At least one geo-tagged photograph of each space type that clearly verifies the building classification - Upgrade schematic and legend with clear references to the building classification - One of the following: - Regulatory or contractual documentation which verifies the building classification - Annual essential safety measures report - For accommodation facilities for the aged, children or people with disabilities, funded by the government, a copy of the Department of Social Services published list of low-level care facilities, in which the facility subject to the upgrade is listed - For non-government funded care facilities (e.g. retirement villages), evidence that the land is registered to be used as a retirement village obtained through the Fair Trading website - Any other third-party documentation which verifies the building classification as deemed acceptable by us⁴⁴.

⁴¹ **School** includes a primary or secondary school, college, university or similar educational establishment

⁴² **Health-care building** means a building whose occupants or patients undergoing medical treatment generally need physical assistance to evacuate the building during an emergency and includes:

- (a) public or private hospital, or
- (b) a nursing home or similar facility for sick or disabled persons needing full-time care, or
- (c) a clinic, day surgery or procedure unit where the effects of the predominant treatment administered involve patients becoming non-ambulatory and requiring supervised medical care on the premises for some time after the treatment.

⁴³ **Detention Centre** means a building in which persons are securely detained by means of the built structure including a prison, remand centre, juvenile detention centre, holding cells or psychiatric detention centre.

⁴⁴ See preceding note.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 3 buildings (other than common areas)	3,000	Residential building, other than a building of Class 1 or 2, which is common place of long term or transient living for a number of unrelated persons, including: • a boarding house, guest house, hostel, lodging house or backpackers accommodation • a residential part of a hotel or motel, or • a residential part of a school • accommodation for the aged, children or people with disabilities • a residential part of a health care building which accommodates members of staff • a residential part of a detention centre.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification.
Class 5 buildings	3,000	An office building used for professional ⁴⁵ or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification.

⁴⁵ This includes professional chambers or suites.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 6 buildings	5,000	A shop or other building for the sale of goods by retail or the supply of services direct to the public, including: • an eating room, café, restaurant, milk or soft drink bar • a dining room, bar area that is not an assembly building⁴⁶, shop or kiosk part of a hotel or motel • a hairdresser or barber shop, public laundry, or undertakers establishment • market or sale room, show room service station⁴⁷.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification. • Upgrade schematic and legend with clear references to the building classification • One of the following: – Regulatory or contractual operating licence which relates to the classification of the building (where applicable) – Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) – Web page printouts (applicable for upgrades > 200 VEECs) printouts⁴⁸, including the official web page address, showing the service provided and the premises address – Annual essential safety measures report – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁴⁹.

⁴⁶ **Assembly building** means a building where people may assemble for:

- (a) civic, theatrical, social, political or religious purposes including a library, theatre, public hall or place of worship **or**
- (b) educational purposes in a school, early childhood centre, preschool or the like, or
- (c) entertainment, recreational or sporting purposes including:
 - (i) a discotheque, nightclub or a bar area of a hotel or motel providing live entertainment or containing a dance floor, or
 - (ii) a cinema, or
 - (iii) a sports stadium, sporting or other club (including gyms), or
- (d) transit purposes including a bus station, railway station, airport or ferry terminal.

⁴⁷ **Service station** means a garage which is not a private garage and is for the servicing of vehicles, other than only washing, cleaning or polishing.

⁴⁸ **Please note:** online directories, social media pages or the like will not be accepted in place of an official web page print outs.

⁴⁹ See preceding note.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 7a buildings (open air car parks only) ⁵⁰	4,500	An open air car park used for the parking of motor vehicles but is neither a private garage nor used for the servicing of vehicles, other than washing, cleaning or polishing.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification
Class 7a buildings (other than an open air car park)	7,000	A building used for the parking of motor vehicles but is neither a private garage nor used for the servicing of vehicles, other than washing, cleaning or polishing.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification. • One of the following: – Regulatory or contractual documentation which verifies the building classification – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁵¹.

⁵⁰ Only luminaires attached to a structure or building are eligible under building based lighting. Luminaires attached to a free-standing pole, bollard, canopy, or similar, must be undertaken under non-building based lighting upgrades (activity 34).

⁵¹ We will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the BCA.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 7b buildings	5,000	A building used for storage, or display of goods or produce for sale by wholesale.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification • One of the following: – Regulatory or contractual documentation which verifies the building classification – Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) – Web page printouts (applicable for upgrades > 200 VEECs) (including the official web page address) showing the service provided and the premises address – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁵².

⁵² See preceding note.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 8 buildings (ANZSIC Division C)	5,000	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried out on for trade, sale or gain and it is classified under the ANZSIC Division C, Manufacturing ⁵³ .	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification • One of the following: – Regulatory or contractual documentation which verifies the building classification – Web page printouts (only applicable for upgrades ≤ 200 VEECs) showing the service provided and the premises address (where an official webpage address is not available, the web page print out can be sourced from a shopping centre directory, True Local or Yellow Pages web page) – Web page printouts (applicable for upgrades > 200 VEECs) (including the official web page address) showing the service provided and the premises address – Company annual report – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁵⁴.

⁵³ **ANZSIC Division C – Manufacturing** are units often described as plants, factories or mills and characteristically use power-driven machines and other materials-handling equipment to produce goods (e.g., bottling, canning, vehicle manufacturing, metal transforming, etc.). For the complete list see: www.npi.gov.au/reporting/industry-reporting-materials/anzsic-code-list

⁵⁴ The ESC will only accept a building surveyor's report as independent third party documentation where the provided report includes a detailed assessment and justification of the building class determination, consistent with Part A3 of the BCA.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 8 buildings (other than ANZSIC Division C)	3,000	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried out on for trade, sale or gain and it is not classified under the ANZSIC Division C, Manufacturing ⁵⁵	- At least one geo-tagged photograph of each space type that clearly verifies the building classification - Upgrade schematic and legend with clear references to the building classification.

⁵⁵ **ANZIC Division C – Manufacturing** are units often described as plants, factories or mills and characteristically use power-driven machines and other materials-handling equipment to produce goods (e.g., bottling, canning, vehicle manufacturing, metal transforming, etc.). For the complete list see: www.npi.gov.au/reporting/industry-reporting-materials/anzsic-code-list

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 9a buildings	6,000	A health care building ⁵⁶ , including those parts of the building set aside as a laboratory	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification • One of the following: – Regulatory or contractual documentation which verifies the building classification – Public health care building: copy of the public health care facilities list published by the Victorian Health Department in its website showing the facility subject to the upgrade – Private health care building: evidence of the facility being licensed to operate under the Health Services Act 1988 and the Health Services (Private Hospitals and Day Procedure Centres) Regulations 2013 (or as changed from time to time) – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁵⁷.

⁵⁶ **Health-care building** means a building whose occupants or patients undergoing medical treatment generally need physical assistance to evacuate the building in case of an emergency and includes:

- (a) a public or private hospital, or
- (b) a nursing home or similar facility for sick or disabled persons needing full-time care, or
- (c) a clinic, day surgery or procedure unit where the effects of the predominant treatment administered involve patients becoming non-ambulatory and requiring supervised medical care on the premises for some time after the treatment.

⁵⁷ See preceding note.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 9b buildings	2,000	An assembly building, including a trade workshop, laboratory or the like in a primary or secondary school, but excluding any other parts of the building that are of another class. An assembly building is a building where people may assemble for: • civic, theatrical, social, political or religious purposes including a library, theatre, public hall, place of worship • educational purposes in a school, early childhood centre⁵⁸, preschool or the like, or • entertainment, recreational or sporting purposes including: – a discotheque, nightclub or a bar area of a hotel or motel providing live entertainment or containing a dance floor – a cinema – a sports stadium, sporting or other club (including gyms) • transit purposes including a bus or railway station, airport or ferry terminal.	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification

⁵⁸ **Early Childhood Centre** means any premises or part thereof providing or intending to provide a centre-based education and care service within the meaning of the *Education and Care Services National Law Act 2010* (Vic), the Education and Care Services National Regulation and centre-based services that are licensed or approved under State and Territory children's services law, but excludes education and care primarily provided to school aged children in outside school hours settings.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 9c buildings	6,000	An aged care building ⁵⁹	• At least one geo-tagged photograph of each space type that clearly verifies the building classification • Upgrade schematic and legend with clear references to the building classification • One of the following: – Regulatory or contractual documentation which verifies the building classification – For accommodation facilities for the aged, children or people with disabilities, funded by the government, a copy of the Department of Social Services published list of low-level care facilities, in which the facility subject to the upgrade is listed – For non-government funded care facilities (e.g. retirement villages), evidence that the land is registered to be used as a retirement village obtained through the Fair Trading website – Any other third-party documentation which verifies the building classification, as deemed acceptable by us⁶⁰.

⁵⁹ **Aged-care building** means a building used for residential accommodation of aged persons who, due to varying degrees of incapacity associated with the aging process, are provided with personal care services and 24 hour staff assistance to evacuate the building during an emergency.

⁶⁰ See preceding note.

BCA building classification	Annual operating hours	Description	Evidentiary requirements for BCA building classification verification
Class 10a buildings	1,000	A private garage, carport, shed or the like.	- At least one geo-tagged photograph of each space type that clearly verifies the building classification - Upgrade schematic and legend with clear references to the building classification.
Class 10b structures ⁶¹	1,000	A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool ⁶² , or the like.	- At least one geo-tagged photograph of each space type that clearly verifies the building classification - Upgrade schematic and legend with clear references to the building classification.

⁶¹ Free-standing lights, street lights, traffic lights or similar, are not regarded as a light affixed to a Class 10b structure and are instead a form of non-building based or public lighting.

⁶² **Swimming pool** means any excavation or structure containing water and used primarily for swimming, wading, paddling or the like, including a bathing or wading pool, or spa.

Appendix D: VEEC calculation for building based lighting upgrades

VEECs are calculated using the following equation:

$$GHG\ eq.\ reduction = (Baseline - Upgrade) \times Lifetime \times Regional\ factor$$

- GHG eq.: Greenhouse gas equivalent
- Regional factors that apply are 0.98 for upgrades undertaken in metropolitan Victoria and 1.04 for upgrades undertaken in regional Victoria

Lifetime is calculated as follows:

$$Lifetime = Asset\ lifetime \times Annual\ operating\ hours \times 10^{-6}$$

- Asset lifetime: See Table 1 for reference values
- Annual operating hours: Defined based on the space type or BCA classification in which an upgrade occurs (as set out in Table 15 and Table 16)

The baseline and upgrade calculation are detailed below.

Baseline calculation ('before')

There are two equations available to calculate baseline energy consumption. Whether the upgrade is required to comply with Part J6 of the current edition of the BCA (as amended from time to time) determines which equation is to be used.

If the upgrade is required to comply with Part J6 of the BCA, the following equation must be used:

$$Baseline = \sum_{each\ space} IPD \times Area \times CM \times AM \times GHG\ coefficient$$

- IPD: The illumination power density, based on the space type as set out in Table 15
- Area: The area of the space, in square metres, of the upgrade area
- CM: The control device multiplier, as outlined in Table 2
- AM: The air-conditioning multiplier, which is equal to 1.05 if the space is air-conditioned and 1 if the space is not air conditioned
- GHG coefficient: The Greenhouse gas coefficient, which is 1.095

If the upgrade does not need to comply with Part J6 of the BCA, then the following equation is used to calculate the baseline:

$$\text{Baseline} = \sum_{\text{each incumbent light source}} LCP \times CM \times AM \times GHG \text{ coefficient}$$

- LCP: The lamp circuit power, usually taken from Table 17. If the type of lamp being replaced is not listed in Table 17, you must apply to us to have a value approved (see Section 2.2.1)
- CM: The control device multiplier, as outlined in Table 2
- AM: The air-conditioning multiplier, which is equal to 1.05 if the space is air-conditioned and 1 if the space is not air conditioned
- GHG coefficient: The Greenhouse gas coefficient, which is 1.095

Upgrade calculation ('after')

The following equation is used to determine the upgrade energy consumption for all sites:

$$\text{Upgrade} = \sum_{\text{each upgrade light source}} LCP \times CM \times AM \times GHG \text{ Coefficient}$$

- LCP: The lamp circuit power, usually taken from Table 17. If the type of lamp being replaced is not listed in Table 17, you must apply to us to have a value approved (see Section 2.2.1)
- CM: The control device multiplier, as outlined in Table 2

- AM: The air-conditioning multiplier, which is equal to 1.05 if the space is air-conditioned and 1 if the space is not air conditioned
- GHG coefficient: The Greenhouse gas coefficient, which is 1.095

Table 17: Lamp circuit power (LCP) calculations

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of A or electronic with no EEI marked)	Nominal lamp power (NLP)	NLP
T8 or T12 linear fluorescent or circular fluorescent lamp with ballast (EEI of $\geq$ B or magnetic with no EEI marked)	NLP + 6	NLP + 6
T5 linear fluorescent lamp with T5 adaptor and magnetic ballast	$NLP \times 0.94 + 1.78$	N/A
T5 linear fluorescent or circular fluorescent lamp with ballast	$NLP \times 1.08 + 1.5$	$NLP \times 1.08 + 1.5$
Compact fluorescent lamp with non-integral ballast (EEI of A or electronic with no EEI marked)	NLP + 1	NLP + 1
Compact fluorescent lamp with non-integral ballast (EEI $\geq$ B or magnetic ballast with no EEI marked)	NLP + 5	NLP + 5
Compact fluorescent lamp with integral ballast	NLP	NLP
Tungsten incandescent or halogen lamp (mains voltage)	$NLP \times 0.7$	NLP
Tungsten incandescent or halogen lamp with ELC	NLP (being no greater than 37 Watts) $\times 1.163$	$NLP \times 1.163$
Metal halide lamp with magnetic ballast	$NLP \times 0.846 + 14.4$	$NLP \times 0.846 + 14.4$

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
Metal halide lamp with electronic ballast	$NLP \times 0.877 + 0.7$	$NLP \times 0.877 + 0.7$
Mercury vapour lamp with ballast	$NLP \times 0.826 + 8.8$	$NLP \times 0.826 + 8.8$
High pressure sodium lamp with magnetic ballast	$NLP \times 0.841 + 10.4$	$NLP \times 0.841 + 10.4$
LED lamp with integrated driver with no associated legacy ballast connected	NLP	NLP
Non-integrated LED lamp with remote driver or ELC	$NLP \times 1.1$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of A or electronic ballast with no EEI marked	NLP	NLP
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of $\geq B$ or magnetic ballast with no EEI marked	$NLP + 6$	$NLP + 6$
LED lamp with integrated driver, connected with a legacy ballast used for a T5 linear or circular fluorescent lamp	$NLP \times 1.08 + 1.5$	$NLP \times 1.08 + 1.5$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with EEI of A or electronic ballast with no EEI marked	$NLP + 1$	$NLP + 1$
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with an EEI of $\geq B$ or a magnetic ballast with no EEI marked	$NLP + 5$	$NLP + 5$
LED integrated luminaire	NLP	NLP

Type of incumbent or upgrade light source	Lamp circuit power for incumbent light source	Lamp circuit power for upgrade light source
Non-integrated LED luminaire with remote driver	$NLP \times 1.1$	$NLP \times 1.1$
LED lamp with integrated driver, connected with a legacy magnetic ballast used for HID lamps	$1.033 \times NLP + 11$	$1.033 \times NLP + 11$
LED lamp with integrated driver, connected with a legacy electronic ballast used for HID lamps	$1.096 \times NLP + 0.9$	$1.096 \times NLP + 0.9$
Induction lamp with integrated ballast	NLP	NLP
Induction lamp with non-integrated ballast	$NLP \times 1.056$	$NLP \times 1.056$
Self-ballasted mercury vapour lamp	$NLP \times 0.8$	$NLP \times 0.8$
Other	As determined by the commission	As determined by the commission

* T5 adaptors as a light source are not an eligible type of upgrade lighting equipment for this activity.

Appendix E: Lamp ballast combination

Table 18: Available lamp ballast combinations for installed fluorescent lamp product types

Lamp ballast combinations	Installed fluorescent lamp product types					
	CFL (GLS)	CFL downlight	T5 linear fluorescent lamp with T5 adaptor	T5 fluorescent lamp	T8 fluorescent lamp	T12 fluorescent lamp
Compact fluorescent lamp with integral ballast	✓	✓				
Compact fluorescent lamp with non-integral ballast (EEI of A or electronic with no EEI marked)	✓	✓				
Compact fluorescent lamp with non-integral ballast (EEI > B or magnetic ballast with no EEI marked)	✓	✓				
T5 linear fluorescent lamp with T5 adaptor (only available for incumbent lamp, not for upgrade)			✓	✓		
T5 linear or circular fluorescent lamp with ballast				✓		
T8 or T12 linear or circular fluorescent lamp with ballast (EEI of A or electronic with no EEI marked)					✓	✓
T8 or T12 linear or circular fluorescent lamp with ballast (EEI of > B or magnetic with no EEI marked)					✓	✓

Table 19: Available lamp ballast combinations for installed LED lamp product types

Lamp ballast combinations	Installed LED lamp product types						
	LED highbay	LED tube (lamp only)	LED downlight with integral driver (240V)	LED ELV downlight with 240V remote driver	LED ELV downlight (lamp only)	LED other (240V)	LED tube (luminaire)
LED integrated luminaire	✓		✓			✓	✓
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of A or electronic ballast with no EEI marked	✓	✓	✓		✓	✓	✓
LED lamp with integrated driver, connected with a non-integral legacy ballast used for a T8 or T12 linear or circular fluorescent lamp, marked with EEI of > B or magnetic ballast with no EEI marked	✓	✓	✓		✓	✓	✓
LED lamp with integrated driver with no associated legacy ballast connected	✓		✓			✓	✓
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with EEI of A or electronic ballast with no EEI marked	✓	✓	✓		✓	✓	✓
LED lamp with integrated driver, connected with a legacy ballast used for a CFL, marked with an EEI of >B or a magnetic ballast with no EEI marked	✓	✓	✓		✓	✓	✓
LED lamp with integrated driver, connected with a legacy ballast used for a T5 linear or circular fluorescent lamp	✓	✓	✓		✓	✓	✓

Lamp ballast combinations	Installed LED lamp product types						
	LED highbay	LED tube (lamp only)	LED downlight with integral driver (240V)	LED ELV downlight with 240V remote driver	LED ELV downlight (lamp only)	LED other (240V)	LED tube (luminaire)
LED lamp with integrated driver, connected with a legacy electronic ballast used for HID lamps	✓		✓		✓	✓	✓
LED lamp with integrated driver, connected with a legacy magnetic ballast used for HID lamps	✓		✓		✓	✓	✓
Non-integrated LED lamp with remote driver or ELC	✓	✓		✓	✓	✓	✓
Non-integrated LED luminaire with remote driver	✓	✓		✓	✓	✓	✓

Table 20: Available lamp ballast combinations for other installed lamp product types

Lamp ballast combination	Other installed lamp product types				
	High pressure sodium	Induction	Mercury vapour	Metal halide	Other
High pressure sodium lamp with magnetic ballast	✓				
Induction lamp with integrated ballast		✓			
Induction lamp with non-integral ballast		✓			

Lamp ballast combination	Other installed lamp product types				
	High pressure sodium	Induction	Mercury vapour	Metal halide	Other
Mercury vapour lamp with ballast			✓		
Self-ballasted mercury vapour lamp			✓		
Metal halide lamp with electronic ballast				✓	
Metal halide lamp with magnetic ballast				✓	
Other – LCP determined by ESC *					✓

* This option is only available for lamp products which have been provided a LCP determination by the commission

Appendix F: Example of a professionally drafted reflective ceiling plan

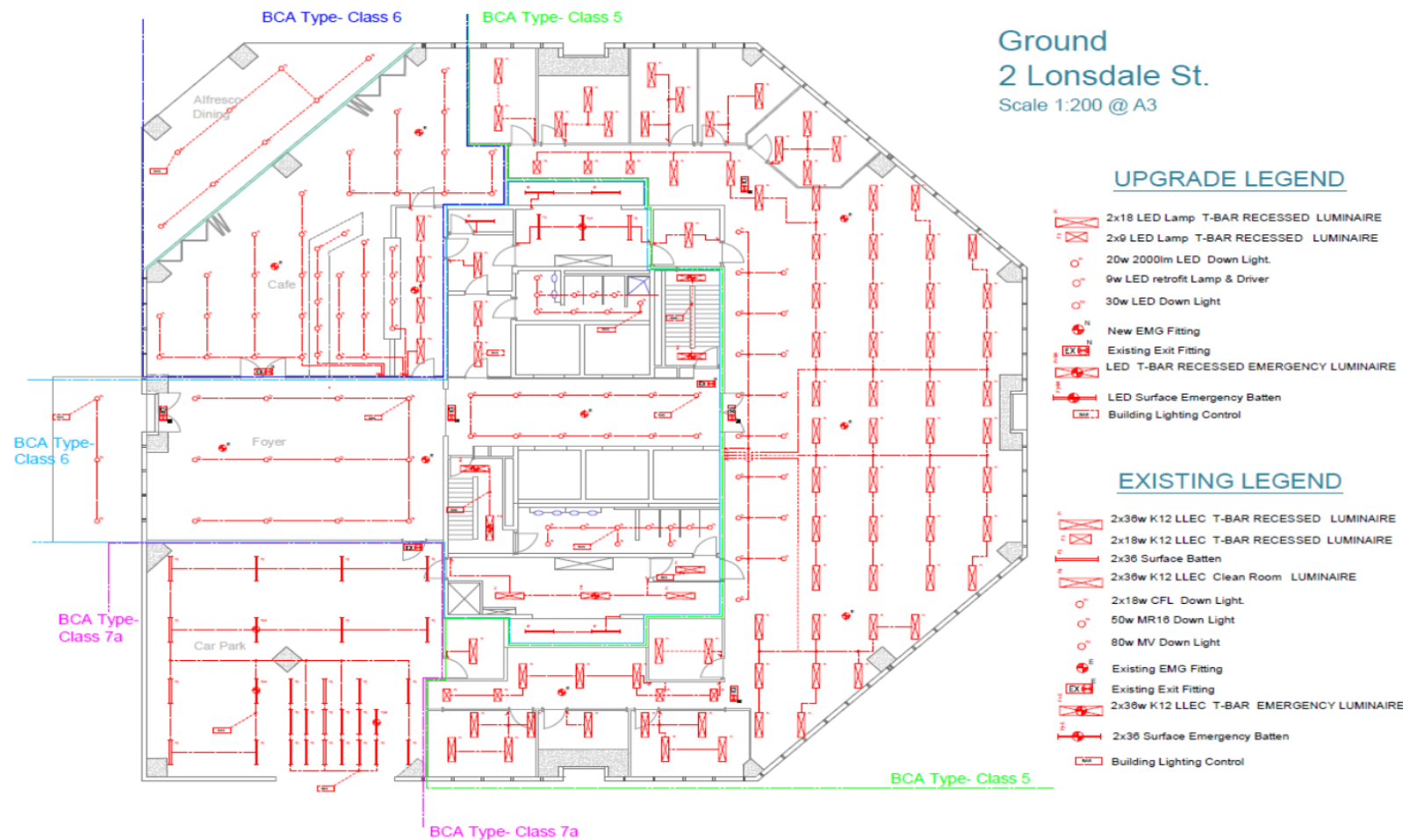


Figure 9: Professionally drafted reflective ceiling plan example – guide only

Document version control

The RM reference for this document is: C/18/24696

Version	Amendments made	Date published
1.0	First release	10 December 2018
1.1	Revision to: clarify definition of licensed electricians clarify requirements relating to open air car parks clarify decommissioning and reconciliation requirements update evidence required for car park related space types and BCA classification with 7000 annual hours provide guidance in respect of lamp ballast combinations for lamp product types (Appendix E).	4 April 2019
1.2	Revision to reflect updates to the VEU specifications to: update the reference to the Building Code of Australia (BCA) include unlisted space type to table 15 in this guide. clarify eligibility of new buildings	10 June 2019
1.3	Revision to reflect introduction of EPA's e-waste policy and clarification of recycling evidence for valid decommissioning.	1 July 2019