Proposed Expansion of Existing Industrial Facility

24-27 Lambridge Place
PENRITH NSW

Compliance Report

Building Code of Australia
Section J – Energy Efficiency

September 2017

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The reader's attention is drawn to the following important information:

Disclaimer

Scope Limitations: This report is to assess the proposed development (named above), with reference to the documents listed in the report, with respect to compliance with the Building Code of Australia (2016) Section J Energy Efficiency provisions and report the results of the assessment to the client

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Document Control

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Description:	The proposed development comprises additions to an existing industrial space featuring new storage facilities with loading docks and WC.	
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Table of Contents

Executive Summary

The development has been assessed against the Deemed to Satisfy provisions of Section J (Energy Efficiency) of the Building Code of Australia. The items outlined below are the requirements for this development to achieve compliance with Section J. These requirements have been determined based on the information provided to Application Solutions at the time of carrying out this assessment. Any design changes should be checked to ensure these requirements remain correct and accurate. Contact Application Solutions for assistance if reassessment is required.

Part J1 – Building Fabric

1. **Construction Requirements –**
   There is no new work which is to be part of the envelope therefore this Part does not apply.

Part J2 – Glazing

2. **Construction Requirements –**
   There is no glazing which is part of the envelope therefore this Part does not apply.

Part J3 – Building Sealing

3. **Construction Requirements –**
   There is no new work which is part of the envelope therefore this Part does not apply.

Part J5 – Air-conditioning and Ventilation Systems

4. **Construction Requirements –**
   There is no air-conditioning system planned therefore this Part does not apply.

Part J6 – Artificial Lighting and Power

5. **Construction Requirements – Maximum Interior Illumination Power Load**
   The total maximum allowed interior illumination power load for the development is 25,008 W.
   The aggregate design illumination power load must not exceed this allowed wattage.
   Note emergency lighting and signage lighting are exempted from this requirement.
   See Appendix for detailed calculation of allowed interior illumination power load.
6. **Construction Requirements – Lighting Control**
   Artificial lighting of a room or space must be individually operated by a switch or other control device.
7. **Construction Requirements – Lighting Control (Switching)**
   Artificial lighting switches must be located in a visible position in the room or space being switched or in an adjacent room or space from where the lighting being switched is visible.
   Switches must not operate lighting for an area of more than 1000 m^2.
8. **Construction Requirements – Time Switch or Occupant Sensing Device**
   95% of the lighting in the building must be controlled by a time switch in accordance with BCA Specification J6 or an occupant sensing device such as a security card reader that registers a person entering and leaving the building or a motion detector in accordance with BCA Specification J6.
9. **Construction Requirements – Decorative or Display Lighting**
   Interior decorative and display lighting (such as for foyer mural art display), shall be controlled separately from other lighting by a manual switch for each area (where the operating times of the displays are the same in multiple areas, they may be combined).
   Where the decorative/display lighting exceeds 1 kW, it must be controlled by a time switch in accordance with BCA Specification J6.

10. Construction Requirements – Perimeter Lighting

Artificial lighting around the perimeter of the building must be controlled by a daylight sensor or a time switch in accordance with BCA Specification J6.
When the total perimeter lighting load exceeds 100 W it shall have an average light source efficacy of not less than 60 Lumens/W or be controlled by a motion detector in accordance with BCA Specification J6.

11. Construction Requirements – Decorative Perimeter Lighting

Where external lighting for decorative or signage purposes is installed, it must be controlled by a time switch (separate from other external lighting) in accordance with BCA Specification J6.

12. Construction Requirements – Boiling/Chilled Water Storage Units

The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with BCA Specification J6.

Part J7 – Heated Water Supply and Swimming Pool and Spa Pool Plant

13. Construction Requirements – Hot Water Heater

Any heated water service for food preparation or sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia.

Part J8 – Access for Maintenance and Facilities for Monitoring

14. Construction Requirements – Gas and Electricity Consumption

The building has a floor area of more than 500 m^2 and therefore must have the facility to record the consumption of gas and electricity.

15. Construction Requirements – Individual Energy Consumption

The building has a floor area of more than 2,500 m^2 and therefore must have the facility to record individually the energy consumption of:
(i) Air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
(ii) Artificial lighting; and
(iii) Appliance power; and
(iv) Central hot water supply; and
(v) Internal transport devices including lifts, escalators and travelators where this is more than one serving the building; and
(vi) Other ancillary plant.

Introduction

Application Solutions has been engaged to provide a compliance assessment of the proposed development with respect to the Building Code of Australia (2016) (BCA), Section J – Energy Efficiency. The BCA2016 is part of the National Construction Series.

The assessment is based on the Deemed-to-Satisfy (DTS) provisions of the BCA. The assessment references the National provisions of the BCA and the NSW Appendix to the BCA.

Throughout this report, reference is made to the ***envelope*** of a building. This is an important term in the application of Section J and is defined in the BCA as follows:

> ***Envelope****, for the purposes of Section J, means the parts of a building's fabric that separate a conditioned space or habitable room from-*
> *(a) The exterior of the building; or*
> *(b) A non-conditioned space including-*
> *(i) The floor of a rooftop plant room, lift-machine room or the like; and*
> *(ii) The floor above a carpark or warehouse; and*
> *(iii) The common wall with a carpark, warehouse or the like.*

For complete understanding, the term ***conditioned space*** is also referred to and is defined in the BCA as follows:

> ***Conditioned space*** *means a space within a building, including a ceiling or under-floor supply air plenum or return air plenum, where the environment is likely, by the intended use of the space, to have its temperature controlled by air-conditioning, but does not include-*
> *(a) A non-habitable room of a Class 2 building or Class 4 part of a building in which a heater with a capacity of not more than 1.2 kW or 4.3 MJ/hour provides the air-conditioning; or*
> *(b) A space in a Class 6, 7, 8 or 9b building where the input energy to an air-conditioning system is not more than 15 W/m^2 or 15 J/s.m^2 (54 KJ/hour.m^2); or*
> *(c) A lift shaft*

References are also made to Specifications and additional information contained within the BCA. It is important to be aware of these details as relevant to Section J compliance. Copies of these are now available free of charge through the Australian Building Codes Board at www.abcb.gov.au

Contact Application Solutions if you need assistance in accessing the online version of the BCA.

Proposed Development

The proposed development comprises additions to an existing industrial space featuring new storage facilities with loading docks and WC.

The proposed development has been classified:

Warehouse	Class 7b

The development is in the Local Government Area (LGA) of Penrith City Council

and therefore the relevant climate zone is Climate Zone 6

The designer for the proposed development is:

Ezzy Architects Pty Ltd
Suite 201, 16 Hunter Street
Hornsby NSW 2077

Assessment Outline

This Assessment examines each Part of Section J in turn and provides an opinion on whether the Part applies in this case and if so whether the Deemed–to-Satisfy provisions have been met. In some cases further clarification is specified in the form of notes to be included on the plans and/or specifications.

A summary of items required to achieve Section J compliance is provided at the beginning of this report. These matters will need to be incorporated into the Construction Certificate documentation before a Construction Certificate is granted.

In the preparation of this assessment, reference was made to the following plans:

Cover	A00
Existing Site	A100
Proposed Site	A101
Flood Area	A102
Existing Ground Floor Plan	A200
Proposed Ground Floor Plan	A201
Ground Floor Travel Distances	A202
Truck Refuelling Plan	A203
Sections	A300
Detail Wall	A301
Landscape Plan	A302
Elevations	A400
Elevations	A401
Shadow Diagrams	A600

Section J: On Completion of Construction

The section above provides the documentation of Section J requirements which apply to the proposed development. Attention is drawn to the need to provide documentation during construction that each requirement has been met.

This should include, where relevant;

- Certificates from specific suppliers and contractors
- Photographic record and
- Site inspections

It is important that the information in this report be forwarded to the person/s responsible on site to ensure all work is carried out in compliance and that each item is documented appropriately.

Part J1 – Building Fabric

J1.1 Application of Part

BCA extract	*The Deemed-to-Satisfy Provisions of this Part apply to building elements forming the envelope of a Class 2 to 9 building.*
Application to Development	**Warehouse** | **Class 7b** | **This Part does not apply as the proposed work is not part of the thermal envelope.**
1. Construction Requirements –	**There is no new work which is to be part of the envelope therefore this Part does not apply.**

Part J2 – Glazing

J2.1 Application of Part

BCA extract	*The Deemed-to-Satisfy Provisions of this Part apply to elements forming the envelope of a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building.*
Application to Development	**Warehouse** | **Class 7b** | **This Part does not apply as the proposed work is not part of the thermal envelope.** | **This Part d glazing sho**
2. Construction Requirements –	**There is no glazing which is part of the envelope therefore this Part does not apply.**

Part J3 – Building Sealing

J3.1 Application of Part

BCA extract	*The Deemed-to-Satisfy Provisions of this Part apply to elements forming the envelope of a Class 2 to 9 building, other than-* *(a) a building in climate zones 1, 2, 3 and 5 where the only means of air-conditioning is by using an evaporative cooler; or* *(b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or* *(c) a building or space where the mechanical ventilation required by **BCA Part F4** provides sufficient pressurisation to prevent infiltration; or* *(d) **NSW BCA J3.1(d)** parts of the building that cannot be fully enclosed.*		
Application to Development	**Warehouse**	**Class 7b**	**This Part does not apply**
3. Construction Requirements –	**There is no new work which is part of the envelope therefore this Part does not apply.**		

Part J4

This Part has deliberately been left blank due to its removal in BCA 2010.

Part J5 – Air-conditioning and Ventilation Systems

J5.1 Application of Part

BCA extract	*The Deemed-to-Satisfy Provisions of this Part do not apply to a Class 8 electricity network substation.*		
Application to Development	**Warehouse**	**Class 7b**	**This Part does not apply as there is no air-conditioning system planned.** *(Refrigeration systems are planned however these are excluded from the requirement of Section J.)*
4. Construction Requirements –	**There is no air-conditioning system planned therefore this Part does not apply.**		

Part J6 – Artificial Lighting and Power

J6.1 Application of Part

Application to Development	**Warehouse**	**Class 7b**	**This Part applies**

J6.2 Artificial lighting

BCA extract	*J6.2 (a) In a sole-occupancy unit of a Class 2 building or a Class 4 part of a building-* *(i) the lamp power density or illumination power density of artificial lighting must not exceed the allowance of -* *(A) 5 W/m^2 within a sole-occupancy unit; and* *(B) 4 W/m^2 on a verandah, balcony or the like attached to a sole occupancy unit; and* *(ii) the illumination power density in **BCA J6.2 (a) (i)** may be increased by dividing it by the illumination power density adjustment factor for a control device in **BCA Table J6.2b** as applicable; and* *(iii) when designing the lamp power density or illumination power density, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and* *(iv) halogen lamps must be separately switched from fluorescent lamps.*
Application to Development	**This clause does not apply to the development as it is not a Class 2 or Class 4 building.**

BCA extract	*J6.2 (b) In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building-* *(i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density in **BCA Table J6.2a**; and* *(ii) the aggregate design illumination power load for **BCA J6.2 (b) (i)** is the sum of the design illumination power loads in each of the spaces served; and*
Application to Development	**This clause applies to the development. Refer to Appendix for calculation of maximum allowable lighting power.** **Note: That Table J6.2b allows the maximum power load to be adjusted by a factor provided in the table where lighting is controlled by movement detectors or dimmers. The adjustment would have the effect of increasing the maximum allowable illumination power. At this stage no adjustment has been made.**
5. Construction Requirements – Maximum Interior Illumination Power Load	**The total maximum allowed interior illumination power load for the development is 25,008 W.** **The aggregate design illumination power load must not exceed this allowed wattage. Note emergency lighting and signage lighting are exempted from this requirement. See Appendix for detailed calculation of allowed interior illumination power load.**

BCA extract	*J6.2 (c) The requirements of **BCA J6.2 (a)** and **BCA J6.2 (b)** do not apply to the following:* *(i) emergency lighting in accordance with **BCA Part E4**.* *(ii) signage and display lighting within cabinets and display cases that are fixed in place.* *(iii) lighting for accommodation within the residential part of a detention centre.* *(iv) a heater where the heater also emits light, such as in bathrooms.* *(v) lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation.* *(vi) lighting of performances such as theatrical or sporting.* *(vii) lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.*

J6.3 Interior artificial lighting and power control

BCA extract	*J6.3 (a) Artificial lighting of a room or space must be individually operated by a switch or other control device.*
Application to Development	**This clause applies to the development**
6. Construction Requirements – Lighting Control	**Artificial lighting of a room or space must be individually operated by a switch or other control device.**

BCA extract	*J6.3 (b) An occupant activated device, such as a room security device, a motion detector in accordance with **BCA Specification J6**, or the like, must be provided in the sole occupancy unit of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the sole-occupancy unit is unoccupied.*
Application to Development	**This clause does not apply to the development as it is not a Class 3 building**

BCA extract	*J6.3 (c) An artificial lighting switch or other control device in **BCA J6.2 (a)** must-* *(i) if an artificial lighting switch, be located in a visible position-* *(A) in the room or space being switched; or* *(B) in an adjacent room or space from where the lighting being switched is visible; and* *(ii) for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse-* *(A) not operate lighting for an area of more than 250 m^2 if in a Class 5 building or a Class 8 laboratory; or* *(B) not operate lighting for an area of more than-* *(aa) 250 m^2 for a space of not more than 2000 m^2; or* *(bb) 1000 m^2 for a space of more than 2000 m^2, if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building.*
Application to Development	**This clause applies to the development**
7. Construction Requirements – Lighting Control (Switching)	**Artificial lighting switches must be located in a visible position in the room or space being switched or in an adjacent room or space from where the lighting being switched is visible.** **Switches must not operate lighting for an area of more than 1000 m^2.**

BCA extract	*J6.3 (d) 95% of the light fittings in a building or storey of a building, other than a Class 2 or 3 building or a Class 4 part, of more than 250 m^2 must be controlled by-* *(i) a time switch in accordance with **BCA Specification J6**; or* *(ii) an occupant sensing device such as-* *(A) a security key card reader that registers a person entering and leaving the building; or* *(B) a motion detector in accordance with **BCA Specification J6**.*
Application to Development	**This clause applies to the development**
8. Construction Requirements – Time Switch or Occupant Sensing Device	**95% of the lighting in the building must be controlled by a time switch in accordance with BCA Specification J6 or an occupant sensing device such as a security card reader that registers a person entering and leaving the building or a motion detector in accordance with BCA Specification J6.**

BCA extract	*J6.3 (e) In a Class 5, 6 or 8 building of more than 250 m^2, artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same storey except where-* *(i) the room containing the natural lighting zone is less than 20 m^2; or* *(ii) the room's natural lighting zone contains less than 4 luminaires; or* *(iii) 70% or more of the luminaires in the room are in the natural lighting zone.*
Application to Development	**This clause does not apply as the development is not a Class 5, 6 or 8 building**

BCA extract	*J6.3 (f) The requirements of **BCA J6.3 (a)**, **(b)**, **(c)**, **(d)** and **(e)** do not apply to the following:* *(i) emergency lighting in accordance with **BCA Part E4**.* *(ii) where artificial lighting is needed for 24-hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a detention centre.* *(g) The requirements of **(d)** do not apply to the following:* *(i) artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as in a patient care area in a Class 9a building or in a Class 9c aged care building.* *(ii) a heater where the heater also emits light, such as in bathrooms.*

J6.4 Interior decorative and display lighting

BCA extract	*J6.4 (a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled-* *(i) separately from other artificial lighting; and* *(ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and* *(iii) by a time switch in accordance with **BCA Specification J6** where the display lighting exceeds 1 kW.*
Application to Development	**This clause applies to the development if decorative or display lighting is planned**
9. Construction Requirements – Decorative or Display Lighting	**Interior decorative and display lighting (such as for foyer mural art display), shall be controlled separately from other lighting by a manual switch for each area (where the operating times of the displays are the same in multiple areas, they may be combined). Where the decorative/display lighting exceeds 1 kW, it must be controlled by a time switch in accordance with BCA Specification J6.**

BCA extract	*J6.4 (b) Window display lighting must be controlled separately from other display lighting.*
Application to Development	**This clause does not apply to the development as no window display lighting is planned**

J6.5 Artificial lighting around the perimeter of a building

BCA extract	*J6.5 (a) Artificial lighting around the perimeter of a building, must-* *(i) be controlled by-* *(A) a daylight sensor; or* *(B) a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and* *(ii) when the total perimeter lighting load exceeds 100 W-* *(A) have an average light source efficacy of not less than 60 Lumens/W or;* *(B) be controlled by a motion detector in accordance with **BCA Specification J6**; and*
Application to Development	**This clause applies to the development if external lighting is planned**
10. Construction Requirements – Perimeter Lighting	**Artificial lighting around the perimeter of the building must be controlled by a daylight sensor or a time switch in accordance with BCA Specification J6.** **When the total perimeter lighting load exceeds 100 W it shall have an average light source efficacy of not less than 60 Lumens/W or be controlled by a motion detector in accordance with BCA Specification J6.**

BCA extract	*J6.5 (a) (iii) when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with **BCA Specification J6**.*
Application to Development	**This clause applies to the development if external lighting for decorative purposes is planned**
11. Construction Requirements – Decorative Perimeter Lighting	**Where external lighting for decorative or signage purposes is installed, it must be controlled by a time switch (separate from other external lighting) in accordance with BCA Specification J6.**

BCA extract	*J6.5 (b) The requirements of **BCA J6.5 (a)(ii)** do not apply to the following:* *(i) emergency lighting in accordance with **BCA Part E4**.* *(ii) lighting around a detention centre*

J6.6 Boiling water and chilled water storage units

BCA extract	*Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with **BCA Specification J6**.*
Application to Development	**This clause applies to the development if boiling water or chilled water storage units are planned**
12. Construction Requirements – Boiling/Chilled Water Storage Units	**The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with BCA Specification J6.**

Part J7 – Heated Water Supply and Swimming Pool and Spa Pool Plant

J7.1 Blank

Application to Development	**Warehouse**	**Class 7b**	**This Part applies**

J7.2 Heated water supply

BCA extract	*A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with **Part B2 of NCC Volume Three – Plumbing Code of Australia**.*
Application to Development	**This clause applies to the development**
13. Construction Requirements – Hot Water Heater	**Any heated water service for food preparation or sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three - Plumbing Code of Australia.**

J7.3 Swimming pool heating and pumping

BCA extract	*J7.3 (a) Heating for a swimming pool must be by-* *(i) a solar heater not boosted by electric resistance heating; or* *(ii) a heater using reclaimed energy; or* *(iii) a gas heater; or* *(iv) a heat pump; or* *(v) a combination of 2 or more of **(i)**, **(ii)**, **(iii)** and **(iv)**.*
Application to Development	**Clause J7.3 does not apply to the development as there is no swimming pool included in the works**

J7.4 Spa pool heating and pumping

BCA extract	*J7.4 (a) Heating for a spa pool that shares a water recirculation system with a swimming pool must be by-* *(i) a solar heater; or* *(ii) a heater using reclaimed energy; or* *(iii) a gas heater; or* *(iv) a heat pump; or* *(v) a combination of 2 or more of **(i)**, **(ii)**, **(iii)** and **(iv)**.*
Application to Development	**Clause J7.4 does not apply to the development as there is no spa pool included in the works.**

Part J8 – Access for Maintenance and Facilities for Monitoring

J8.1 Application of Part

BCA extract	*The Deemed-to-Satisfy Provisions of this Part do not apply-* *(a) within a sole-occupancy unit of a Class 2 building or a Class 4 part of a building; or* *(b) to a Class 8 electricity network substation.*
Application to Development	**Warehouse** | **Class 7b** | **This Part applies**

J8.2 Blank

This clause has deliberately been left blank in BCA2016.

J8.3 Facilities for energy monitoring

BCA extract	*J8.3 (a) A building or sole-occupancy unit with a floor area of more than 500 m^2 must have the facility to record the consumption of gas and electricity.*
Application to Development	**This clause applies to the development as the floor area of the development is greater than 500 m^2.**
14. Construction Requirements – Gas and Electricity Consumption	**The building has a floor area of more than 500 m^2 and therefore must have the facility to record the consumption of gas and electricity.**

BCA extract	*J8.3 (b) A building with a floor area of more than 2,500 m^2 must have the facility to record individually the energy consumption of-* *(i) air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and* *(ii) artificial lighting; and* *(iii) appliance power; and* *(iv) central hot water supply; and* *(v) internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and* *(vi) other ancillary plant.*
Application to Development	**This clause applies to the development**
15. Construction Requirements – Individual Energy Consumption	**The building has a floor area of more than 2,500 m^2 and therefore must have the facility to record individually the energy consumption of:** **(i) Air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and** **(ii) Artificial lighting; and** **(iii) Appliance power; and** **(iv) Central hot water supply; and** **(v) Internal transport devices including lifts, escalators and travelators where this is more than one serving the building; and** **(vi) Other ancillary plant.**

BCA extract	*J8.3 (c) The provisions of **BCA J8.3 (b)** do not apply to a Class 2 building with a floor area of more than 2,500 m^2 where the total area of the common areas is less than 500 m^2.*

Appendix 1 – Lighting Calculations

Expansion of existing industrial facility - 24-27 Lambridge Place, Penrith

Spaces	Space Categories	Area (m^2)	Power Density (W/m^2)	Maximum Power Load (W)
Warehouse (East End)	**Storage with shelving higher than 75% of the height of the aisle lighting**	1046.00	10	10,460
Warehouse (West End)	**Storage with shelving higher than 75% of the height of the aisle lighting**	1236.00	10	12,360
Loading Docks	**Zone (c) In other areas not specified in Table J6.2a, for an illuminance of more than 160 lx and not more than 240 lx**	216.00	10	2,160
Unisex Toilet	**Toilet, locker room, staff room, rest room and the like**	4.60	6	28
Total		**2,502.60**		**25,008**