



BLACKETT
MAGUIRE+
GOLDSMITH

BCA ASSESSMENT REPORT

**Oakdale Central
Sites 1C, 2B & 3
Milner Ave Horsely Park**

Revision 0
10 October 2013
Project No.: 130335

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REPORT STATUS				
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A. INTRODUCTION

A.1 BACKGROUND

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Goodman Property Services (Aust) Pty Ltd, to undertake a preliminary review of the proposed development against the deemed-to-satisfy (DTS) provisions of the Building Code of Australia 2013 (BCA) pursuant to the provisions of clause 145 of the *Environmental Planning & Assessment Regulation 2000* and clause 18 of the *Building Professionals Regulation 2007*.

The proposed development comprises the construction of three (3) industrial building over Sites 1C, 2B & 3 at Oakdale Central, Horsely Park.

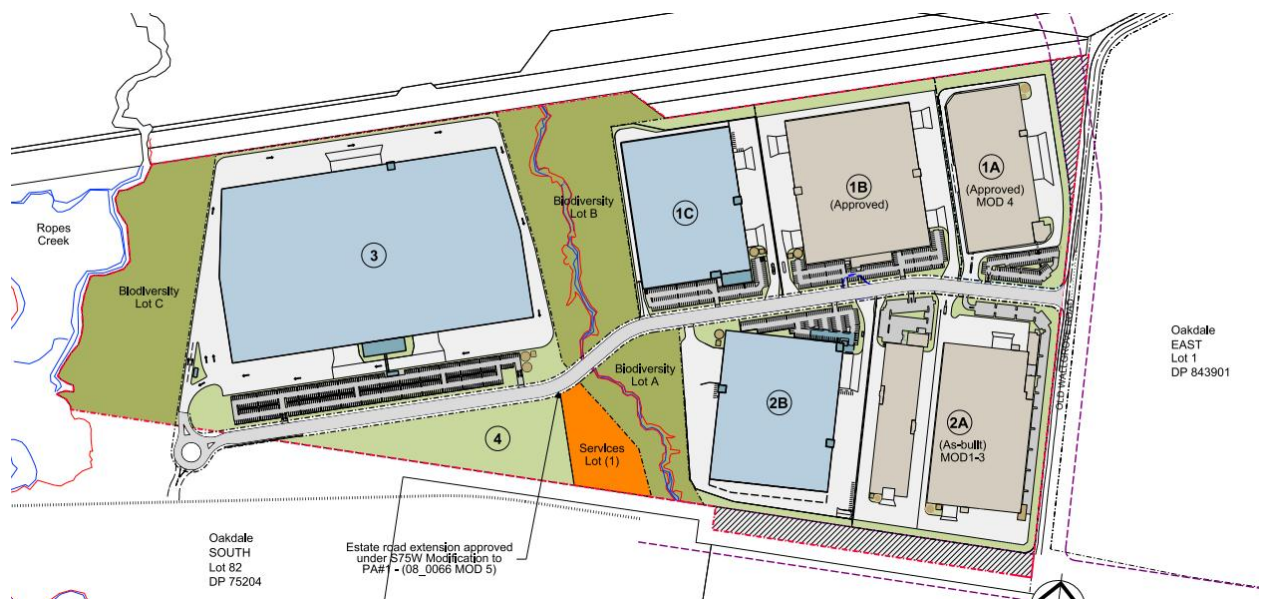


Figure 1: Estate Masterplan

A.2 Aim

The aim of this report is to:

- + Confirm that the referenced documentation has been reviewed by an appropriately qualified Building Surveyor.
- + Undertake an assessment of the proposed new building works against the deemed-to-satisfy provisions of the BCA.
- + Identify matters that require plan amendments in order to achieve compliance with the BCA.
- + Identify matters that are to be required to be addressed by Alternative Solutions.
- + Identify essential fire safety measures applicable to the building.
- + Accompany the Development Application for consideration and approval by the Consent Authority, and to enable the Consent Authority to be satisfied that the development can readily achieve compliance with the BCA.

A.3 PROJECT TEAM

The following BM+G Team Members have contributed to this Report:

- + Assessment – Tony Heaslip (Senior Building Surveyor)
- + Report Preparation – Tony Heaslip (Senior Building Surveyor)
- + Quality Assurance – Dean Goldsmith (Director)



A.4 DOCUMENTATION

The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- + Building Code of Australia 2013 (BCA)
- + Guide to the Building Code of Australia.
- + Information/documentation provided by the Client
- + Architectural plans prepared by SBA Architects;

Drawing No.	Revision	Date
OAK DA 01	D	27 September 2013
OAK DA 02	H	9 October 2013
OAK 1C DA10	G	9 October 2013
OAK 1C DA11	C	August 2013
OAK 1C DA12	C	27 September 2013
OAK 1C DA13	C	27 September 2013
OAK 1C DA14	C	27 September 2013
OAK 1C DA15	C	27 September 2013
OAK 2B DA20	G	9 October 2013
OAK 2B DA21	C	27 September 2013
OAK 2B DA22	C	27 September 2013
OAK 2B DA23	C	27 September 2013
OAK 2B DA24	C	27 September 2013
OAK 2B DA25	C	27 September 2013
OAK 2B DA26	B	27 September 2013
OAK 3 DA30	F	9 October 2013
OAK 3 DA31	C	27 September 2013
OAK 3 DA32	C	9 October 2013
OAK 3 DA33	C	9 October 2013
OAK 3 DA34	B	27 September 2013
OAK 3 DA35	D	9 October 2013
OAK 3 DA36	D	9 October 2013

A.5 LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- + The following assessment is based upon a review of the architectural plans for the proposed building only – no site inspection or review of other consultant's drawings have been carried out at this stage.
- + No assessment has been undertaken with respect to the Disability Discrimination Act 1992 (DDA). The building owner should be satisfied that their obligations under the DDA have been addressed.
- + The Report does not address matters in relation to the following:
 - i. Local Government Act and Regulations.
 - ii. Occupational Health and Safety Act and Regulations.
 - iii. WorkCover Authority requirements.
 - iv. Water, drainage, gas, telecommunications and electricity supply authority requirements.
 - v. Disability Discrimination Act 1992.
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A.6 TERMINOLOGY

Alternative Solution – A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.

Building Code of Australia - Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in NSW under the provisions of the Environmental Planning & Assessment Act & Regulation.

Climatic Zone – Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Construction Certificate – Building Approval issued by the Certifying Authority pursuant to Part 4A of the EP&A Act 1979.

Construction Type – The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Deemed-to-Satisfy (DTS) Provisions of the BCA – Means the prescriptive provisions of the BCA which are deemed to satisfy the performance requirements.

Effective Height – The height to the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.

Fire Resistance Level (FRL) – The grading periods in minutes for the following criteria-

- (a) structural adequacy; and
 - (b) integrity; and
 - (c) insulation,
- and expressed in that order

Fire Source Feature (FSF) - The far boundary of a road adjoining the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

National Construction Code Series (NCC) – The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupation Certificate (OC) – Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open space - Means a space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Requirements of the BCA - A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by-

- (a) complying with the Deemed-to-Satisfy Provisions; or
- (b) formulating an Alternative Solution which-
 - (i) complies with the Performance Requirements; or
 - (ii) is shown to be at least equivalent to the Deemed-to-Satisfy Provisions; or
- (c) a combination of (a) and (b).



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 can include a dwelling and/or office suite.

B. BUILDING CHARACTERISTICS

In summary, the key building characteristics have been identified as follows:

	SITE 1C	SITE 2B (Stage 1)	SITE 3
BCA CLASSIFICATION:	Class 5 Offices Class 7b Warehouse	Class 5 Offices Class 7b Warehouse	Class 5 Offices Class 7b Warehouse
RISE IN STOREYS:	Two (2)	Two (2)	Two (2)
TYPE OF CONSTRUCTION:	Type C - Large Isolated Building	Type C - Large Isolated Building	Type C - Large Isolated Building
EFFECTIVE HEIGHT:	Less than 12m	Less than 12m	Less than 12m
FLOOR AREA:	27,505m ²	33,025m ²	88,295m ²
VOLUME:	> 108,000m ³	> 108,000m ³	> 108,000m ³
CLIMATE ZONE:	6	6	6

C. SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance issues identified under the clause-by-clause assessment in Appendix 1 of this report. These matters are to be addressed prior to issue of the Construction Certificate.

C.1 MATTERS REQUIRING FURTHER RESOLUTION/PLAN AMENDMENTS

BCA Clause/s		Description
Site 1C, 2B & 3		
1.	D1.13 (inter alia D1.6 & F2.3)	The number of occupants that will occupy the building is to be confirmed by the tenant.
2.	D3 & AS 1428.1-2009	Access to the building is required from the following: + All main entry points on the allotment boundary; and + Any accessible car parking within the site. The reference plans indicate that compliance with the above is readily achievable in this instance, however further details are required with respect to levels from the site entry at the allotment boundary (Milner Ave) and the accessible path of travel to the main entry of the building.
3.	E1.3	Fire hydrant and booster locations are not identified on the referenced plans. Fire hydrant and booster locations to be confirmed. In particular, the following should be noted: <ul style="list-style-type: none"> The fire hydrant booster must be located within sight of the main entry of the building. The fire hydrant booster assembly must be located a minimum 10m from the building, and a minimum 10m from the substation. Ring main must be provided. Fire hydrants must be located externally in the first instance. Additional internal fire hydrants may then be provided for coverage. The external fire hydrants must be positioned so that no point on the floor is more than 100mm from a fire hydrant in order to satisfy fire brigade operational requirements. This may necessitate



BCA Clause/s		Description
		<p>locating fire hydrants underneath the awnings, which in turn requires an Alternative Solution (refer to section C.2), and the provision of additional doors to the external walls.</p> <p><i>Note: Hydraulic plans showing fire hydrant and hose reel locations will be required for submission with the clause 144 Application to FRNSW.</i></p>
Site 2B (Stage 1)		
4.	D2.20	<p>The direction of swing for the following exit doors do not currently comply with the BCA DTS provisions (i.e. they do not swing in the direction of egress):</p> <ul style="list-style-type: none"> + Lobby Entry Doors at Ground Floor – Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m). + Staff Entry doors at Ground Floor.
Site 3		
5.	D2.20	<p>The direction of swing for the following exit door does not currently comply with the BCA DTS provisions (i.e. they do not swing in the direction of egress):</p> <ul style="list-style-type: none"> + Office Main Entry at Ground Floor (RL 65.70).

C.2 MATTERS REQUIRING FIRE SAFETY ENGINEERED ALTERNATIVE SOLUTIONS

BCA Clause/s		Description
Site 1C		
1.	C2.4	<p>The following compliance issues have been identified with respect to the proposed perimeter vehicular access serving Site 1C:</p> <ul style="list-style-type: none"> + Vehicular access is discontinuous at the south-western and south-eastern corners of the building, due to carpark configuration and division to the hardstand. Where the Estate Road (Milner Ave) is to be relied upon to form part of the perimeter vehicular access, it is situated more than 18m from the building and as such is non-compliant with the BCA DTS provisions. + The vehicular width of the vehicular access at the Gatehouse is less than the DTS prescribed minimum of 6m (4.5m proposed).
2.	D1.4	Maximum travel distance of 90m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).
3.	D1.5	Maximum travel distance of 180m between alternative exits within the warehouse (in lieu of BCA DTS maximum of 60m).
4.	E1.3 (inter alia AS 2419.1: 2005)	To allow external fire hydrants to be located beneath the awnings protruding from the eastern elevations.
5.	E4.5 & E4.6 (inter alia AS 2293.1: 2005)	Exit signage to be positioned above the maximum height of 2.7m prescribed under AS 2293.1:2005 to permit the passage of fork lifts machinery below.
6.	E2.2	To allow manual operated smoke clearance system within the warehouse in lieu of automatic smoke exhaust system throughout the building.



BCA Clause/s		Description
Site 2B (Stage 1)		
7.	C2.4	The following compliance issues have been identified with respect to the proposed perimeter vehicular access serving Site 2B: + Vehicular access is provided on the northern portion of the building via the Estate Rd (Millner Ave). This vehicular access is greater than 18m from the building and as such is non-compliant with the BCA DTS provisions.
8.	D1.4	Warehouse – Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).
9.	D1.5	Maximum travel distance of 190m between alternative exits within the warehouse (in lieu of BCA DTS maximum of 60m).
10.	E1.3 (inter alia AS 2419.1: 2005)	To allow external fire hydrants to be located beneath the awnings protruding from the eastern and western elevations.
11.	E4.5 & E4.6 (inter alia AS 2293.1: 2005)	Exit signage to be positioned above the maximum height of 2.7m prescribed under AS 2293.1:2005 to permit the passage of fork lifts machinery below.
12.	E2.2	To allow manual operated smoke clearance system within the warehouse in lieu of automatic smoke exhaust system throughout the building.
Site 3		
13.	C2.4	The following compliance issues have been identified with respect to the proposed perimeter vehicular access serving Site 3: + Vehicular access to the southern side of the building necessitates passing beneath a pedestrian bridge.
14.	D1.4	Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).
15.	D1.5	Maximum travel distance of 190m between alternative exits within the warehouse (in lieu of BCA DTS maximum of 60m).
16.	E1.3 (inter alia AS 2419.1: 2005)	To allow external fire hydrants to be located beneath the awnings protruding from the northern and southern elevations.
17.	E4.5 & E4.6 (inter alia AS 2293.1: 2005)	Exit signage to be positioned above the maximum height of 2.7m prescribed under AS 2293.1:2005 to permit the passage of fork lifts machinery below.
18.	E2.2	To allow manual operated smoke clearance system within the warehouse in lieu of automatic smoke exhaust system throughout the building.



D. BCA ASSESSMENT

The following comments have been made in relation to the relevant BCA provisions relating to each of the proposed new buildings.

Section B – Structural Provisions:

1. Part B1 – Structural Provisions: Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1 in relation to the new structural elements of the building.

Structural design and certification will be required at CC application stage

2. BCA cl. B1.4 Materials and Forms of Construction: Structural resistance of materials and forms of construction to comply with BCA clause B1.4. Design certification confirming compliance in this instance is to also be submitted with the Construction Certificate application.

Structural engineering details are to consider the following Australian Standards (as applicable), and any other appropriate standards accordingly:

- AS 1170.0 – 2002 General Principles
- AS 1170.1 – 2002, including certification for balustrades (dead and live loads)
- AS 1170.2 – 2011, Wind loads
- AS 1170.4 – 2007, Earthquake loads
- AS 3700 – 2011, Masonry code
- AS 3600 – 2009, Concrete code
- AS 4100 – 1998, Steel Structures and/or
- AS 4600 – 2005, Cold formed steel.
- AS 1720.1 – 2010, Design of timber structures
- AS 2047 – 1999, Windows in buildings.
- AS 1288 – 2006, Glass in buildings.
- AS 3660.1 – 2000, Termite control.
- AS 1860 – 2006, Particle board flooring.

BCA Section C – Fire Resistance

3. Clause C1.1 – Type of Construction Required: Type C Construction – Large Isolated Building applies to the new building. As the buildings are situated on one allotment, and the building will be situated more than 3m from a fire source feature, fire resisting construction under Specification C1.1 is not required
4. BCA cl. C1.10: Early Fire Hazard Properties: Floor, wall and ceiling linings are required to comply with the requirements under specification C1.10 and C1.10a. Certification of design will be required at CC Application stage and test certificates of the proposed linings will be required to be submitted prior to issue of the Occupation Certificate.
5. BCA cl. C1.11 Performance of external walls: Concrete external walls are required to be designed to minimize the likelihood of collapsing outwards in the event of a fire. Design certification will be required to be submitted by a Structural Engineer confirming compliance with Specification C1.11 at the CC Application stage.
6. BCA cl. C2.2 General Floor Area and Volume Limitations: The proposed floor area and volume of each building exceeds the limitations for Type C Construction, and as such the facility is defined as a single “Large Isolated Building” - see comments under C2.3 and C2.4 below.



7. BCA cl. C2.3 Large Isolated Buildings: The floor area/volume limitations under C2.2 can be exceeded where the building is deemed to be a 'Large Isolated Building'. This will allow each building to remain as Type C Construction. As the compartment size of each building exceeds 18,000m² and 108,000m³ and the ceiling height is more than 12m, the provision of sprinklers, smoke exhaust and perimeter vehicular access are required. Note: The perimeter vehicular access requirements are outlined below under C2.4.
8. BCA cl. C2.4 Requirements for Open Spaces and Vehicular Access: A minimum unobstructed width of 6m is required around the building for fire brigades perimeter vehicular access with no part of its furthest boundary more than 18m from the building. Furthermore, vehicular access must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles, and must provide reasonable pedestrian access from the vehicular access to the building.

The following compliance issues have been identified with respect to the proposed perimeter vehicular access serving each building:

- a) Site 1C: Vehicular access is discontinuous at the south-western and south-eastern corners of the building, due to carpark configuration and division to the hardstand. Where the Estate Road (Milner Ave) is to be relied upon to form part of the perimeter vehicular access, it is situated more than 18m from the building and as such is non-compliant with the BCA DTS provisions.
- Furthermore, the vehicular width of the vehicular access at the Gatehouse is less than the DTS prescribed minimum of 6m (4.5m proposed).
- b) Site 2B: Vehicular access is provided on the northern portion of the building via the Estate Rd (Millner Ave). This vehicular access is greater than 18m from the building and as such is non-compliant with the BCA DTS provisions.
- c) Site 3: Vehicular access to the southern side of the building necessitates passing beneath a pedestrian bridge.

It will be necessary for an alternative solution to be prepared to address these non-compliance issues, in order to demonstrate compliance with Performance Requirement CP9.

9. BCA cl. C2.12 Separation of Equipment:

- (a) Equipment other than that described in (b) and (c) must be separated from the remainder of the building with construction complying with (d), if that equipment comprises:
- (i) lift motors and lift control panels; or
 - (ii) emergency generators used to sustain emergency equipment operating in emergency mode; or
 - (iii) central smoke control plant; or
 - (iv) boilers; or
 - (v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours;*
- * Note: Designated areas for forklift battery charging may require 2hr fire separation if the batteries exceed these limitations.*
- (b) Equipment need not be separated in accordance with (a) if the equipment comprises—
- (i) smoke control exhaust fans located in the air stream which are constructed for high temperature operation in accordance with Specification E2.2b; or
 - (ii) stair pressurising equipment installed in compliance with the relevant provisions of AS/NZS 1668.1; or
 - (iii) a lift installation without a machine-room; or
 - (iv) equipment otherwise adequately separated from the remainder of the building.



- (c) Separation of on-site fire pumps must comply with the requirements of AS 2419.1.
- (d) Separating construction must have—
 - (i) except as provided by (ii)—
 - (A) an FRL as required by Specification C1.1, but not less than 120/120/120; and
 - (B) any doorway protected with a self-closing fire door having an FRL of not less than –/120/30; or
 - (ii) when separating a lift shaft and lift motor room, an FRL not less than 120/-/-.

10. **BCA cl. C2.13 Electricity Supply Systems:**

- (a) An electricity substation located within a building must—
 - (i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and
 - (ii) have any doorway in that construction protected with a self-closing fire door having an FRL of not less than –/120/30.
- (b) A main switchboard located within the building which sustains emergency equipment operating in the emergency mode must—
 - (i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and
 - (ii) have any doorway in that construction protected with a self-closing fire door having an FRL of not less than –/120/30.
- (c) Electrical conductors located within a building that supply—
 - (i) a substation located within the building which supplies a main switchboard covered by (b); or
 - (ii) a main switchboard covered by (b), must—
 - (iii) have a classification in accordance with AS/NZS 3013 of not less than—
 - (A) if located in a position that could be subject to damage by motor vehicles — WS53W; or
 - (B) otherwise — WS52W; or
 - (iv) be enclosed or otherwise protected by construction having an FRL of not less than 120/120/120.
- (d) Where emergency equipment is required in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment, must be constructed so that emergency equipment switchgear is separated from non-emergency equipment switchgear by metal partitions designed to minimise the spread of a fault from the non-emergency equipment switchgear

BCA Section D – Access and Egress

11. **BCA cl. D1.4 Exit Travel Distance:** The proposed buildings do not comply with the 40m exit travel distance requirement under this clause. In this regard the following non-compliance is noted:
- + Site 1C: Warehouse – Maximum travel distance of 90m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).
 - + Site 2B:
 - Warehouse – Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).



- + Site 3: Warehouse – Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).

Note 1: The above maximum exit travel distances takes into consideration the racking layout shown on the referenced plans.

Note 2: It is understood that a Fire Safety Engineer is to be engaged to prepare an Alternative Solution having regard to the above non-compliance. In this regard the relevant Performance Requirements are DP4 and EP2.2.

12. BCA cl. D1.5 Distances Between Alternative Exits: The proposed building also does not comply with the DTS maximum 60m distance required between alternative exits under this clause. The maximum distance between alternative exits were measured as follows:

- + Site 1C: Warehouse – Maximum travel distance of 180m between alternative exits (in lieu of BCA DTS maximum of 60m)
- + Site 2B: Warehouse – Maximum travel distance of 190m between alternative exits (in lieu of BCA DTS maximum of 60m).
- + Site 3: Warehouse – Maximum travel distance of 190m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).

Note 1: The above max. distances between alternative exits takes into consideration the racking layout shown on the referenced plans.

Note 2: It is understood that a Fire Safety Engineer is to be engaged to prepare an Alternative Solution having regard to the above non-compliance. In this regard the relevant Performance Requirements are DP4 and EP2.2.

13. Clause D1.9 – Travel by non-fire isolated stairways and ramps: Travel via non-fire isolated exits complies with BCA clause D1.9.
14. Clause D1.10 – Discharge from Exit: Where an exit discharges to open space that is at a different level to that of the public roadway, the path of travel must be via a 1:8 ramp or DTS compliant stairs. We note that compliance is readily achievable in this instance.
15. Clause D2.7: Installations in exits and Paths of Travel: No access to service shafts will be provided within fire isolated stairs, passageways or ramps.

Any electrical meters, distribution boards or ducts, central communications distribution boards or equipment or electrical motors must be smoke sealed and enclosed within non-combustible construction with any penetrations smoke sealed.

Gas and other fuel services must not be located within a required exit.

Note that an opening to any chute that or duct that is to convey hot products or combustion from a boiler incinerator, fireplace or the like must not be located in any part of a required exit or any corridor, hallway, lobby or the like leading to a required exit.

16. Clause D2.8 – Enclosures under Stairs and Ramps: The space below a required non fire-isolated stairway (including an external stairway) or non fire-isolated ramp must not be enclosed to form a cupboard or other enclosed space unless-
 - (i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and
 - (ii) any access doorway to the enclosed space is fitted with a self-closing -/60/30 fire door.
17. Clause D2.9 – Width of Stairs: The required width of a stairway must be measured clear of all obstructions such as handrails, projecting parts of balustrades or other barriers and the like; and extend without interruption, except for ceiling cornices, to a height not less than 2m vertically above a line along the nosings of the treads or the floor of the landing. A required stairway that exceeds 2m in width is counted as having a width of only 2m



unless it is divided by a handrail, balustrade or other barrier continuous between landings and each division is less than 2m wide.

18. Clause D2.13 – Treads and Risers: The stairs must comply with the following requirements of BCA clause D2.13.

- + not more than 18 nor less than 2 risers in each flight.
- + except as permitted by (i), going (G), riser (R) and quantity (2R + G) in accordance with Table D2.13.
- + except as permitted by (i), goings and risers that are constant throughout in one flight.
- + risers which do not have any openings that would allow a 125mm sphere to pass through between the treads.
- + treads which have a non-slip finish or an adequate non-skid strip near the edge of the nosings.
- + not more than 36 risers in consecutive flights without a change in direction of at least 30°.
- + in the case of a required stairway, no winders in lieu of a landing.

	Riser (R)		Going (G) ^(b)		Quantity (2R+G)	
	Max	Min	Max	Min	Max	Min
Public stairways	190	115	355	250	700	550
Private stairways ^(a)	190	115	355	240	700	550

125 mm sphere must not pass through treads

Note:

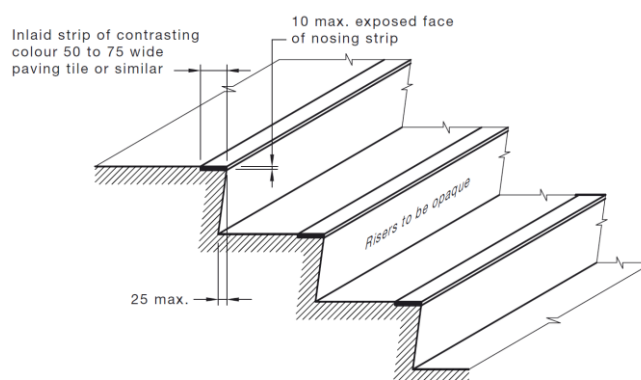
(a) Private stairways are—

- (i) stairways in a sole-occupancy unit in a Class 2 building or Class 4 part; and
- (ii) in any building, stairways which are not part of a required exit and to which the public do not normally have access.

(b) The going in tapered treads (except winders in lieu of a quarter or half landing) in a curved or spiral stairway is measured—

- (i) 270 mm in from the outer side of the unobstructed width of the stairway if the stairway is less than 1 m wide (applicable to a non-required stairway only); and
- (ii) 270 mm from each side of the unobstructed width of the stairway if the stairway is 1 m wide or more.

In addition to the above, contrast nosings are required to all stairways in accordance with AS1428.1-2009, as detailed below:



Source – Section 10.8.1 of AS1428.1-2009

19. Clause D2.14 – Landings: All new stair landings must be provided with a non-slip nosing to the edge of the landings and have a gradient not steeper than 1:50.



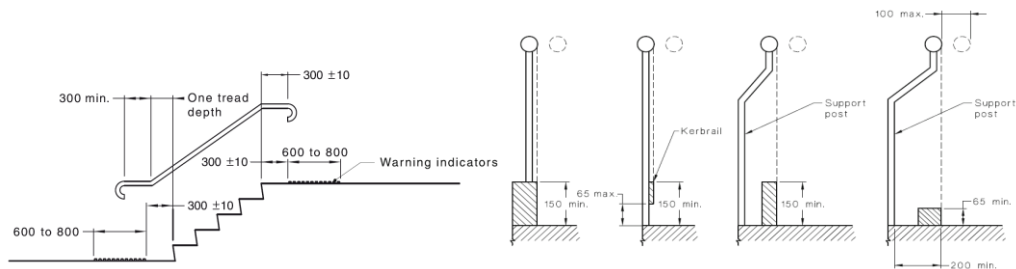
20. Clause D2.15 – Thresholds: Doors must not have a ramp or step closer to the door than the width of the door leaf except where opening to open space, unless the door is provided with a threshold ramp or step ramp in accordance with AS 1428.1

21. Clause D2.16 – Balustrades or other barriers: All balustrades generally must be compliant in terms of a minimum of 1 metre in height above any fall more than 1m with no gaps greater than 125mm.

Where the fall exceeds 1-metre the balustrade must be provided a minimum of 865-mm in height with no gaps greater than 125-mm and where any landing exceeds 500mm that the height of balustrading will be a minimum of 1m.

Where the window sill height is less than 865mm and the fall exceeds 1m the window must be fixed so as to open no more than 125mm or that a rail/s will be installed to restrict the gap to 125mm where less than 865mm above the floor.

22. Clause D2.17 – Handrails: Handrails are required to both sides of all stairways and are to comply with AS 1428.1-2009 (refer to figures below).



Source – Section 10.3 of AS1428.1-2009

23. Clause D2.19 – Doorways and Doors: The referenced plans comply with BCA D2.19 subject to:

- + The proposed power operated auto-sliding doors to be used as egress doors must be able to be opened with a force not more than 110N if there is a malfunction or failure of the power source; and also fail open on power failure and activation of a smoke detector within the fire compartment.

24. Clause D2.20 – Swinging Doors: The swing of doors shown on the referenced plans generally comply with BCA clause D2.20, with the exception of:

- + Site 2B:
 - Lobby Entry Doors at Ground Floor – Maximum travel distance of 95m to one of two alternative exits (in lieu of BCA DTS maximum of 40m).
 - Staff Entry doors at Ground Floor.
- + Site 3: Office Main Entry at Ground Floor (RL 65.70).

25. BCA cl. D2.21 Operation of latch: A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900mm and 1,100mm from the floor.

26. BCA Part D3: Access for people with disabilities: Access to the building is required from the following:

- + All main entry points on the allotment boundary; and
- + Any accessible car parking within the site.

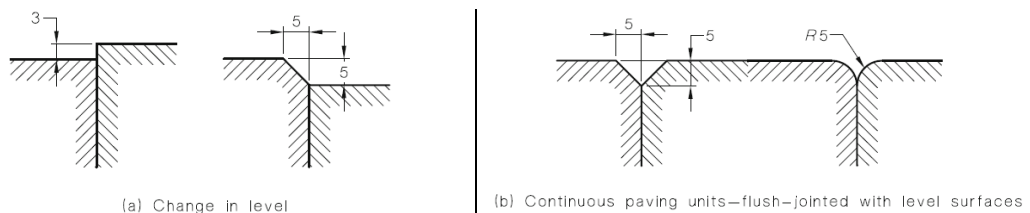


The reference plans indicate that compliance with the above is readily achievable in this instance, however further details are required with respect to levels from the site entry at the allotment boundary (Milner Ave) and the accessible path of travel to the main entry of the respective buildings.

In addition to the above, access for people with disabilities is also required throughout the building, with the exception of the first floor level of Dock Office on the basis that the first floor level is less than 100m².

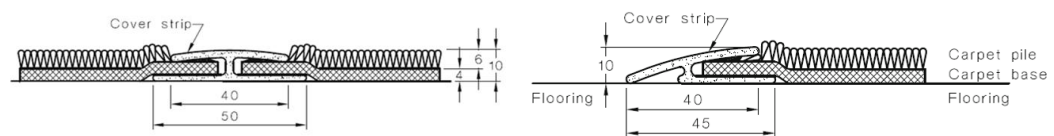
Internal access is required to comply within AS 1428.1 to all areas. A summary of the key access requirements is provided below:

- + Internal surfaces are to comply with Section 7 of AS1428.1-2009.
- + Internal tiles or internal vinyls are to comply with AS 4586.
- + All finished floor surfaces are to be trip free, the following details demonstrate the tolerance level for floor finishes:



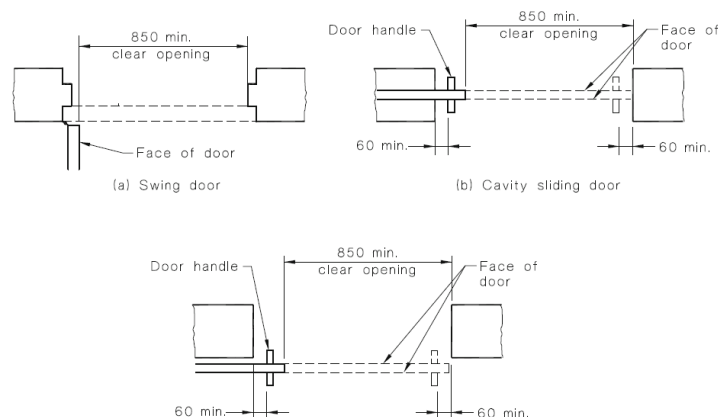
Source – Section 7.2 of AS1428.1-2009

- + Any proposed carpets within the building are to have a pile height or pile thickness not exceeding 11mm and the carpet backing thickness shall not exceed 4mm (total thickness shall not exceed 15mm).



Source – Section 7.4.1 of AS1428.1-2009

- + All doorways are required to achieve a minimum unobstructed clear width of 850mm (clear opening width does not include the door leaf thickness). The following excerpt from AS1428.1-2009 identifies how clear opening width is measured for swinging and sliding doors:

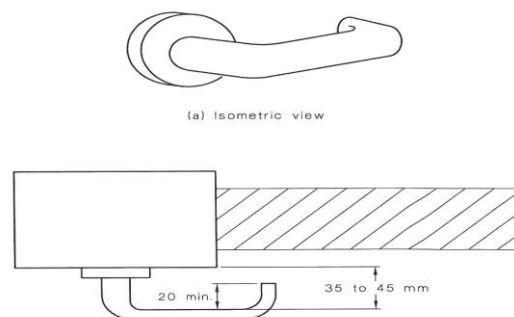


Source – Section 13.2 of AS1428.1-2009



Note: Generally, a proposed 920 doorway will achieve this 850mm minimum requirement.

- + All frameless glass panels or fully glazed doors on an accessway are to be clearly marking in accordance with AS 1428.1. In this instance, all frameless glass panel or fully glazed doors, including glazing capable of being mistaken for a doorway or opening, shall be marked with a full width solid non transparent contrast line not less than 75mm wide is required to be located between 900mm and 1000mm above floor level.
- + AS 1428.1-2009 Clause 13.1 requires a luminance contrast colour of 30% to all new doorways; including door frames (to clearly identify the difference between the door and the adjoining wall/door frame).
- + Circulation space at new doorways must comply with clause 13 of AS1428.1-2009. In this instance, the reference plans do not comply in the following areas:
- + All door handles and related hardware to new doorways required to be accessible shall be of a type that allows the door to be unlocked and opened with one hand in accordance with AS1428.1-2009:



Source – Section 13.5.2 of AS1428.1-2009

- + All switches and controls, other than general purpose outlets, shall be located not less than 900 mm nor more than 1,100 mm above the FFL and not less than 500 mm from internal corners except where on the architrave on the latch side as shown in Figure 37 of AS 1428.1-2009:

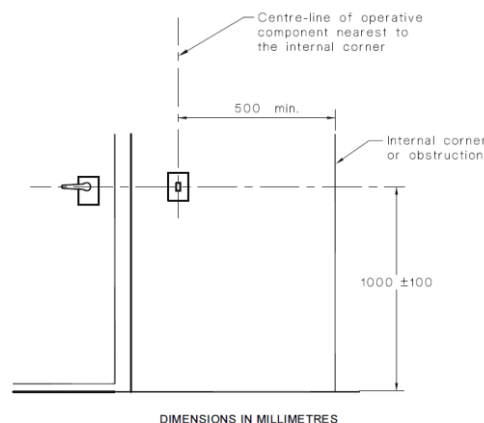


FIGURE 37 HEIGHTS FOR SWITCHES AND DOOR HANDLES

Source – Section 14.2 of AS1428.1-2009

- + Clear and legible Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access in accordance with AS 1428.1 must identify:
 - (i)
 - (A) sanitary facility, and

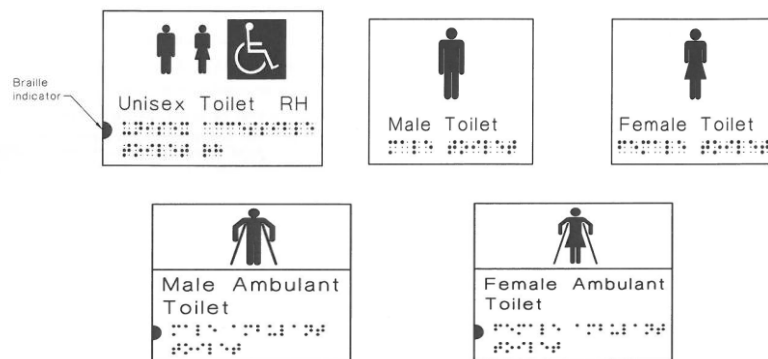


- (B) space with a hearing augmentation system; and
- (ii) identify each door required by E4.5 to be provided with an exit sign and state—
 - (A) "Exit"; and
 - (B) "Level" followed by the floor level number; and

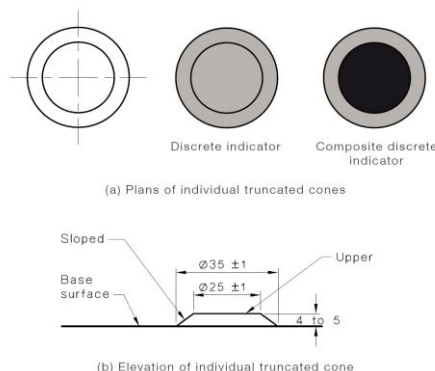
Where a pedestrian entrance is not accessible, directional signage incorporating the international symbol of access, in accordance with AS 1428.1 must be provided to direct a person to the location of the nearest accessible pedestrian entrance.

Where a bank of sanitary facilities is not provided with an accessible unisex sanitary facility, directional signage incorporating the international symbol of access in accordance with AS 1428.1 must be placed at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex sanitary facility.

Signage, including Braille & tactile signage where appropriate, is required to comply with BCA clause D3.6 and Section 8 of AS 1428.1-2009 for sanitary facilities, ambulant facilities and disabled car parking spaces. In addition, the signage to the accessible toilet facilities is to also identify the facility for left and right handed use.



- + AS 1428.4.1 tactile indicators are required to warn people with a vision impairment that they are approaching the following –
 - All stairs, (other than fire stairs)
 - A ramp (other than a step or kerb ramp).
 - Under any overhead obstruction less than 2-metres high (e.g. under non-enclosed stair treads).
 - Tactile indicators will need to be provided to the mezzanine stairway. Indicators must be Type B and installed in accordance with AS 1428.4.



Source – Section 6.1 of AS1428.4-1992



- + Decals are required to warn people with vision impairment that they are approaching any new glazed panels with the decals to be provided as per AS 1428.1 – 2009, clause 6.6. This requires a solid-non-transparent line 75mm in width, located between 900mm and 1100mm above the floor and 30% contrasting when viewed against the floor surface/s within 2m of the glazing on the opposite side of the glass.
- + The proposed number of accessible car spaces shown on the referenced plans comply with BCA clause D3.5. The accessible car space must comply with AS/NZS 2890.6.
- + Vertical access is required to the first floor level of the offices due to the total floor area of the storey exceeding 200msq. In this regard a compliant 1400mm x 1100mm passenger lift will be required to be provided in accordance with the requirements of Part E3.

BCA Section E – Services and Equipment

27. Part E Services and Equipment: The following fire safety measures are required to each building in accordance with the provisions of Section E:

- | | |
|--|---|
| - Fire hydrant systems | BCA Clause E1.3 & AS 2419.1-2005 |
| - Hose reel system | BCA Clause E1.4 & AS 2441-2005 |
| - Automatic fire suppression system (sprinklers) | BCA Spec. E1.5 & AS 2118.1-1999 |
| - Portable fire extinguishers | BCA Clause E1.6 & AS 2444-2001 |
| - Fire Control Centre | BCA Spec. E1.8 |
| - Automatic Smoke Exhaust | BCA Table E2.2a & AS 1668.1-1998 |
| - Emergency Lighting | BCA Clauses E4.2/E4.4 & AS/NZS 2293.1-2005 |
| - Exit Signs | BCA Clauses E4.5, NSW E4.6, E4.8 and AS/NZS 2293.1-2005 |

Note:

1. The standards of performances nominated above may vary as a result of the proposed fire engineered alternative solutions that will apply to each building.
2. If an alternative solution is proposed in relation the provision of smoke exhaust in the Large Isolated Buildings, the relevant Performance Requirement is EP2.2.
3. The above is not a Fire Safety Schedule for the purposes of cl. 168 of the Environmental Planning & Assessment Reg. 2000.
4. Refer to comments under Part D3 regarding the required lift size to provide compliant accessibility to the Level 1 offices to each building.

BCA Section F – Health & Amenity

28. BCA Part F3 Sanitary and other Facilities: While the referenced plans appear to show sufficient facilities to serve the respective buildings, potential Staff Population numbers will be required to be confirmed by Goodman in order to confirm if the sanitary facilities provided achieve compliance with Table F2.3.

In addition, compliant accessible toilet facilities and Male/Female ambulant toilet facilities are required to be provided within all areas of each unit in the building in accordance with the requirements of Table F2.4. The referenced plans show an adequate number of accessible and ambulant facilities in this regard. The fitouts of which are to comply with AS 1428.1-2009.



Each proposed accessible toilet has been counted once for each sex in accordance with BCA clause F2.6.

Note: In accordance with F2.5 the construction of sanitary compartments must have doors and partitions 1.8 metres above floor level and doors to fully enclosed sanitary compartments must be removable from the outside where they swing inwards.

29. BCA Part F4 Light and Ventilation: All artificial lighting must comply with AS 1680. Mechanical ventilation must comply with AS 1668.2-1991.
30. Section J – Energy Efficiency: The energy efficiency provisions of Section J are applicable to each building, and as such, a report will be required to be submitted prior to issue of the Construction Certificate which details how compliance is being achieved.

In this regard Parts J1 - Building Fabric, J2 - External Glazing, J3 - Building Sealing and J5 - Air Conditioning and Mechanical Ventilation are only applicable to the office component of the building. Part J6 - Artificial Lighting and Power, and Part J7 - Hot water supply, apply to the whole building.

C. CONCLUSION

Based upon the above comments and our assessment of the referenced drawings it is considered that compliance with the relevant DTS provisions and Performance Requirements identified within this report are readily achievable, however full details demonstrating compliance are required to be submitted with the CC Application.