



**BLACKETT
MAGUIRE+
GOLDSMITH**

BCA ASSESSMENT REPORT

**AUSTRAL BRICKS PLANT NO.2 EXTENSION
174-181 FERRERS RD, HORSLEY PARK**

BRICKWORKS

Revision 1

Date: 17.05.2019

Project No.: 180346



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REPORT STATUS				
DATE	REVISION	STATUS	AUTHOR	REVIEWED
06.05.2019	0	Preliminary Assessment	DG	TH
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Prepared by:

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Director

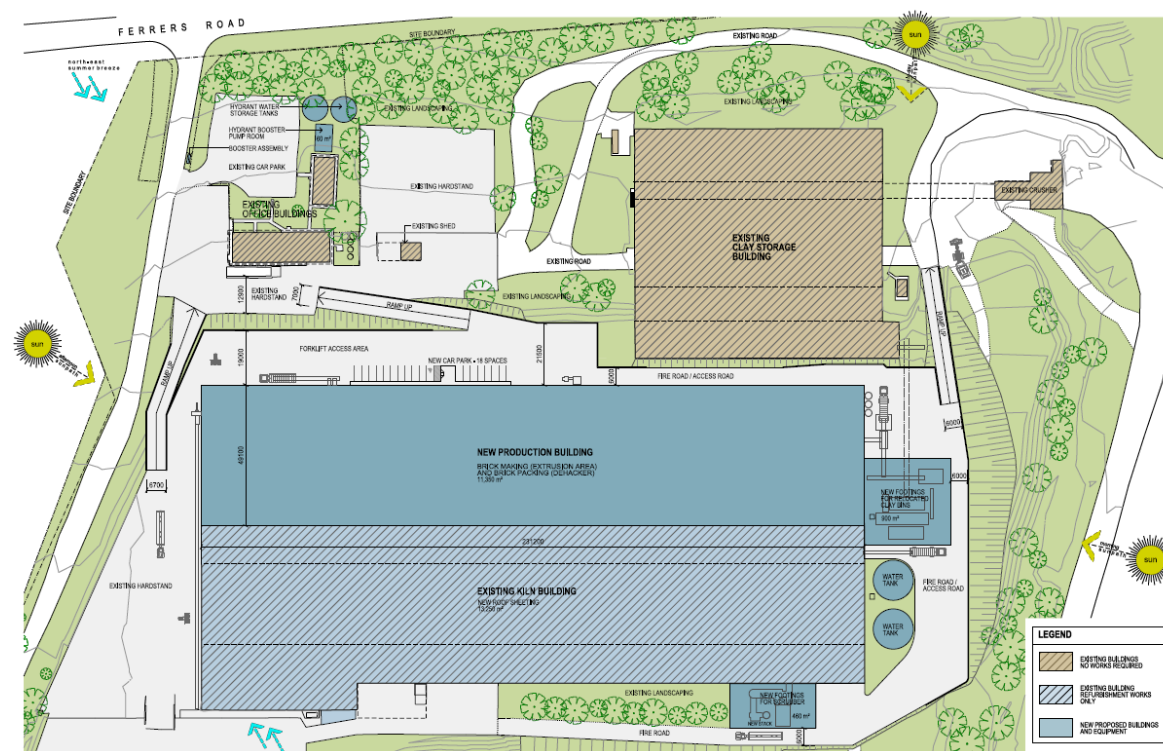
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A. INTRODUCTION

A.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned to undertake a Building Code of Australia 2019 (BCA) assessment for the proposed new factory/production building extension to the existing Austral Brick Plant No.2 building located at Ferrers Road, Horsley Park, pursuant to the provisions of clause 145 of the *Environmental Planning & Assessment Regulation 2000* and clause 18 of the *Building Professionals Regulation 2007*. Note: This Report relates to the New Production Building and Existing Kiln/Factory Building only – no assessment has been carried out on the existing Offices or Clay Storage Building as they are not proposed to be altered as part of this project.



Source: SBA Drawing NoDA105 Rev. D

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 works and the existing building 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.

A.3 PROJECT TEAM

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

- + Assessment – Dean Goldsmith (Director) & Tom Johnston (Building Surveyor)
- + Peer Review – Tony Heaslip (Director)

A.4 DOCUMENTATION

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



- + BCA 2019
- + Guide to the BCA 2019.
- + Architectural plans prepared by SBA Architects:

Drawing No.	Revision	Date	Drawing No.	Revision	Date
DA101	B	26.03.2019	DA102	C	26.03.2019
DA103	C	26.03.2019	DA104	B	26.03.2019
DA105	C	26.03.2019	DA110	C	26.03.2019
DA201	C	26.03.2019	DA202	C	26.03.2019

A.5 REGULATORY FRAMEWORK

Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

Clause 143(3) of the EPA Regulation 2000 prevents a certifying authority from issuing a construction certificate if the proposed new work will result in a reduction to the fire protection and structural capacity of the building.

A.6 LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- + The following assessment is based upon a review of the architectural documentation.
- + No assessment has been undertaken with respect to the Disability Discrimination Act (DDA) 1992. The building owner should be satisfied that their obligations under the DDA have been addressed. In this regard however, the provisions of the DDA Access to Premises – Buildings Standards have been considered as they are generally consistent with the accessibility provisions of the BCA as referenced below.
- + The Report does not address matters in relation to the following:
 - i. Local Government Act and Regulations.
 - ii. NSW Public Health Act 1991 and Regulations.
 - iii. Occupational Health and Safety (OH&S) Act and Regulations.
 - iv. Work Cover Authority requirements.
 - v. Water, drainage, gas, telecommunications and electricity supply authority requirements.
 - vi. DDA 1992.
- + BM+G Pty Ltd do not guarantee acceptance of this report by Local Council, FRNSW or other approval authorities.
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A.7 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 (BCA)

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 New South Wales (NSW) under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance based format.

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.

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.

Deemed to Satisfy Provisions (DtS)

Provisions which are deemed to satisfy the Performance Requirements.

Effective Height

The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and 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).

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 which adjoins 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

Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open Space

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 DtS 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 DtS Provisions; or
- (c) a combination of (a) and (b).

Sole Occupancy Unit (SOU)

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 dwelling.



B. BUILDING CHARACTERISTICS

B.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the existing and proposed production building extension:

▪ BCA Classification:	Existing: Class 5 (Office), Class 7b (Warehouse) & Class 8 (Manufacturing) Proposed: Class 5 (Office), Class 7b (Warehouse) & Class 8 (Manufacturing)
▪ Rise in Storeys:	Existing & Proposed: One (1)
▪ Effective Height:	Existing & Proposed: Less than 12m
▪ Type of Construction:	Existing & Proposed: Type C Construction (Large Isolated Building) Note: Refer to additional comments under C1.1 & C1.2.
▪ Climate Zone:	Zone 6
▪ Max. Floor Area:	Existing & Proposed: Greater than 18,000 ² (Large Isolated Building)
▪ Max. Volume:	Existing & Proposed: Greater than 108,000m ³ (Large Isolated Building)

B.2 FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features are:

Boundary	Distance to Fire Source Feature
Northern Boundary	>3m
Southern Boundary	>3m
Eastern Boundary	>3m
Western Boundary	>3m

C. BCA ASSESSMENT

C.1 BCA DEEMED-TO-SATISFY COMPLIANCE ISSUES:

The following comments have been made in relation to the relevant BCA provisions relating to the compliance issues associated with the extension of the existing production facility.

1. Part B1 – Structural Provisions

Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

1. AS 1170.0 – 2002 General Principles
2. AS 1170.1 – 2002, including certification for balustrades (dead and live loads)
3. AS 1170.2 – 2011, Wind loads
4. AS 1170.4 – 2007, Earthquake loads
5. AS 3700 – 2011, Masonry code
6. AS 3600 – 2014, Concrete code
7. AS 4100 – 1998, Steel Structures and/or
8. AS 4600 – 2005, Cold formed steel.
9. AS 1720.1 – 2010, Design of timber structures



10. AS 2047 – 2014, Windows in buildings.
11. AS 1288 – 2006, Glass in buildings.
12. AS 3660.1 – 2014, Termite control.
13. AS 1860 – 2006, Particle board flooring

Comments: Structural design details and certification will be required at CC application stage for the proposed building extension, including certification that the existing building is capable of withstanding the new loads imposed by the new works.

SECTION C – FIRE RESISTANCE

FIRE RESISTANCE AND STABILITY

2. Clause C1.1 – Type of Construction Required

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 in this clause.

Comments: Type C Construction applies to the existing Factory/Production Building and the proposed extension.

3. Clause C1.2 – Calculation of Rise in Storeys

The rise in storeys of a building is the sum of the greatest number of storeys at any part of the external walls of the building and any storeys within the roof space calculated in accordance with the requirements set out in this clause.

Comments: Rise is storeys of one (1) applies to the existing building.

4. Clause C1.9 – Non-Combustible Building Elements

In a building of Type A or Type B Construction a number of building elements are required to be non-combustible including external walls & common walls (including elements incorporated in them including the façade coverings, framing and insulation), lift pit flooring and floor framing, services risers, load-bearing internal walls and fire walls.

C1.9(e) provides a list of materials that may be deemed as non-combustible without the need for verification testing per AS 1530.1.

Comments: Only applicable to Type A & B construction buildings.

5. Clause C1.10 – Fire Hazard Properties

The fire hazard properties of the following linings, materials and assemblies in a Class 2 to 9 building must comply with **Specification C1.10** and the additional requirements of the **NSW Provisions** of the Code.

Note: See NSW C1.10(a) & (b).

Comments: Design certification required at CC & CDC application stage for all proposed floor, wall and ceiling linings.

6. Clause C1.14 – Ancillary Elements

An ancillary element must not be fixed, installed or attached to the internal or external parts of a non-combustible wall unless it is one of the concession items listed in items (b) – (m).

Comments: Note – only applies to Type A & B construction buildings.

COMPARTMENTATION AND SEPARATION

7. Clause C2.2 – General Floor Area and Volume Limitations

Sets out the parameters for the area and volume of Class 5, 6, 7, 8 & 9 buildings as required by sub-clauses (a), (b) & (c).

Note: Table C2.2 maximum size of Fire Compartments or Atriums.

Comments: The existing building (and proposed extension) is a Class 5, 7b & 8 – Large Isolated Building of Type C Construction and as such the provisions for maximum fire compartment size under Table C2.2 do not apply. Refer to comments under C2.3 & C2.4 below in relation to the Large Isolated Building provisions applicable to the proposed development.



8. Clause C2.3 – Large Isolated Buildings

A Large Isolated Building that exceeds 18,000 m² in floor area or 108,000 m³ in volume, is required to be—

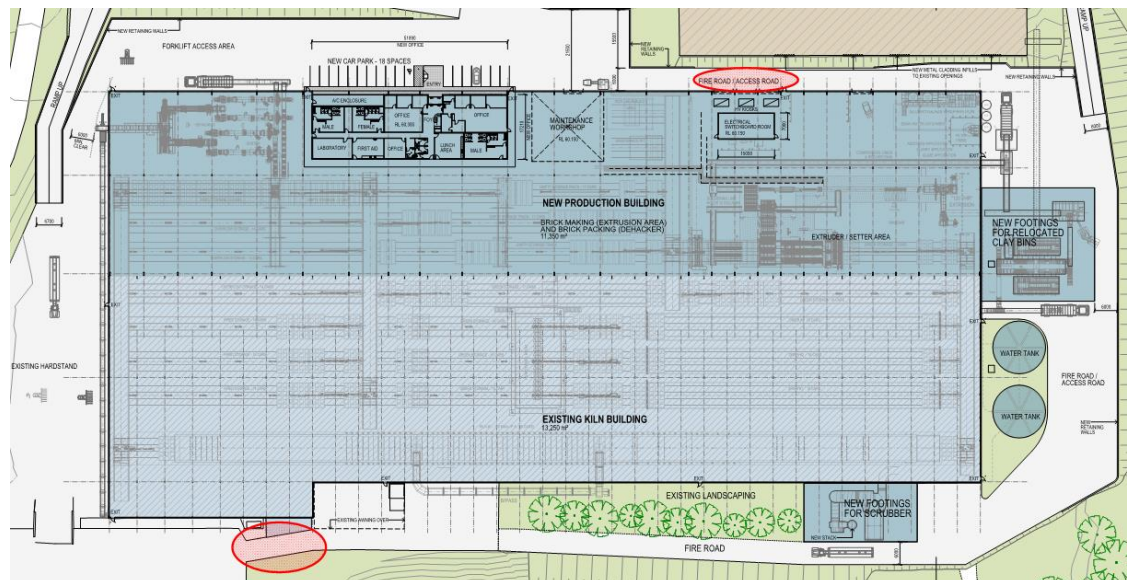
- (i) protected throughout with a sprinkler system complying with Specification E1.5; and
- (ii) provided with a perimeter vehicular access complying with C2.4(b).

Comments: The extended building will exceed the area and volume set out in Table C2.2 and as such is required to be sprinkler protected throughout and provided with perimeter vehicular access in accordance with Clause C2.4 (see notes below) pursuant to the Large Isolated Building designation under this clause.

9. Clause C2.4 – Requirements for Open Spaces & Vehicular Access

An open space and vehicular access required by C2.3 must comply with the requirements of sub-clauses (a) & (b) of this Part as that they must be 6m wide within 18m of the building and of a suitable bearing capacity and unobstructed height to permit the operation and passage of F&RNSW vehicles.

Comments: The existing building does not comply with the provisions of C2.4, however, the proposed extension and ancillary external hardstand have provided a compliant 6m wide vehicular accessway around the full perimeter of the Existing Kiln/New Production Building. Confirmation of the width of all parts of the new and existing driveways will be required at CC stage to confirm if a Performance Solution is required from the Fire Engineer for the minor non-compliances circled in red in the mark-up below.



10. Clause C2.8 Separation of Classifications in the Same Storey

If a building has parts of different classifications located alongside one another in the same storey, each element must have the required higher FRL for the classifications concerned.

Alternatively, the parts must be separated by a fire wall having the higher FRL for the classifications prescribed in Table 3 or 4 of BCA Specification C1.1 (for Type a or Type B Construction), or Table 5 for Type C Construction. Concessions are available for some carparks.

Comments: The same FRL requirements apply to the Class 5, 7b & 8 portions of the proposed building extension and as such a fire wall is not required to separate the Production Building and the Office.

11. Clause C2.12 – Separation of Equipment

Equipment as listed below 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 the 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: Separating construction must have –

- (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

Comments: Architect to note – any proposed equipment that falls within the description above that is located within the building will require 2hr fire separation. Details demonstrating compliance will be required to be provided at the CC Application stage.

12. Clause C2.13 – Electricity Supply System

- (a) An electricity substation, main switchboard which sustains emergency equipment operating in the emergency mode, 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) Having any doorway in that construction protected with a self-closing fire door having an FRL of not less than -/120/30
- (i) Be separated from any other part of the building by construction having an FRL of not less than -/120/30.
- (ii) Have any doorway in that construction protected with a self-closing fire door having an FRL of not less than -/120/30.
- (b) Electrical conductors located within a building that supply –

Note: Where emergency equipment is required in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment switchgear is separated from the non-emergency equipment switchgear by metal partitions designed to minimise the spread of fault from the non-emergency equipment switchgear.

Comments: The proposed main electrical switchboard that sustain any essential services within the production building extension will require 2hr fire separation. Details demonstrating compliance will be required to be provided at the CC Application stage.

PROTECTION OF OPENINGS

13. Clause C3.15 – Openings for Services Installations

All opening for services installations in building elements required to be fire-resisting with respect to integrity and insulation must be protected in accordance with the provisions of Spec. C3.15.

Comments: Note – Refer to comments under Spec. C1.1 below & C2.12/C2.13 above for required fire rated building elements.

SPECIFICATIONS

14. Specification C1.1 – Fire Resisting Construction

The new building works are required to comply with the requirements detailed under Table 4 of Specification C1.1 for Type B Construction – see Appendix 1. In this regard the existing building elements are required to comply with the following.

Comments: Due to the configuration and position of the building on site there are no external walls or other load-bearing elements that are required to be fire rated under the provisions of Table 3 of Spec C1.1.

15. Specification C1.10 – Fire Hazard Properties

This Specification sets out requirements in relation to the fire hazard properties of linings, materials and assemblies in Class 2 to 9 buildings as set out in the Tables.

Comments: Refer to comments under Clause C1.10 above – certification will be required at both CC and OC Application stages.

SECTION D – ACCESS & EGRESS

PROVISION FOR ESCAPE

16. Clause D1.4 – Exit Travel Distances

This clause specifies the permitted travel distances allowable from Class 2 to Class 9 buildings. Sub-clauses (a) to (f) specify the maximum distances to be taken into account for the various uses in each Class of building.



Comments: The exit travel distances in the proposed building extension are considered to be non-compliant with the requirements of Clause D1.4 as detailed below:

- + The distance to the nearest from the central portion of the building is 65m;
- + The distance to a point of choice top alternative exits around the Dehacker equipment and the Extruder / Setter Area is up to 30m – to be confirmed upon receipt of detailed equipment layout plans.

It is noted that the above non-compliances are to be addressed by the Fire Engineer as a Performance Solution to demonstrate compliance with Performance Requirements DP45 and EP2.2.

17. Clause D1.5 – Distances Between Alternative Exits

Exits required as alternative exits must be –

- (a) not less than 9m apart; and
- (b) not more than – 60m apart.
- (c) Located so that the alternative paths of travel do not converge such that they become less than 6m apart.

Comments: The distances between alternative exits in the building extension are considered to be non-compliant with the provisions of D1.5, whereby the worst-case distances in the proposed extension is 125m between alternative exits.

It is noted that the above non-compliances are to be addressed by the Fire Engineer as a Performance Solution to demonstrate compliance with Performance Requirements DP45 and EP2.2.

18. Clause D1.6 – Dimensions of Exits

This clause details the minimum dimensions such as height and width of paths of travel from Class 2 to 9 buildings. It also specifies the minimum dimensions of doorways from the various compartments and the width of exit doors from buildings depending on the uses and functions carried out within them.

Comments: The population of the building will need to be confirmed by Brickworks at the CC Application, however, compliance with D1.6 is readily achievable.

In addition to the above it is to be noted that all exit paths are required to have a minimum clear width of 1m and a minimum clear height of 2m generally and 1980mm through doorway openings per D1.6(a).

19. Clause D1.10 – Discharge from Exits

Requires that an exit must not be blocked at the point of discharge. Barriers such as bollards must be installed to prevent vehicles from blocking the discharge from exits.

This clause also provides the methods of construction, location and separation, at exit discharge points for all building Classes.

Comments: All discharge points from the exits of the proposed and existing parts of the building are required to be protected in accordance with the requirements of this clause.

20. Clause D1.13 – Number of Persons Accommodated

Clause D1.13 and Table D1.13 are used to calculate the anticipated number of people in particular types of buildings so that minimum exit widths and the required number of sanitary and other facilities can be calculated. This clause and table are not to be used for non-BCA purposes.

Comments: As indicated above, the population of the building will need to be confirmed by Brickworks at the CC Application stage to confirm compliance with D1.6 and F2.3.

CONSTRUCTION OF EXITS

21. Clause D2.7 – Installations in Exits & Paths of Travel

This clause restricts the installation of certain services in fire-isolated exits, non-fire-isolated exits and certain paths of travel to exits. Sub-clauses (a) to (e) prescribes which services **shall not be installed** as well as the circumstances in which certain services **may be installed** in fire-isolated and non-fire-isolated exits.

Comments: This requirement applies to all cupboards containing electrical distribution boards or comms. equipment that are located in a path of travel to an exit. In this regard such cupboards (existing or proposed) are to be enclosed in non-combustible materials and are to be suitably sealed against the spread of smoke.



22. Clause D2.13 – Goings & Risers

This clause sets out the detailed requirements for the construction and geometry of the goings and risers in required stairways. These details are set out in sub-clauses (a) to (c) and Table D2.13 Riser and Going Dimensions.

Note: NSW D2.13(a)(ix)(x)(xi).

Comments: Any stairs that form an egress path in and around the proposed new equipment (including the Dehacker, Kiln Control Room, Extruder/Setter Area, & Slurry/Glaze Preparation) are to have dimensions in accordance with Table D2.13 (below), and have solid risers, contrasting nosings, and slip resistant surfaces throughout in accordance with clause 11 of AS1428.1-2009. Refer to the slip resistance for stairs below under Clause D2.14. Note: A Performance Solution or AS 1657 compliance may be more suitable for these stairs, however, details will be required at the CC Application stage to assess compliance.

Riser and Going Dimensions (mm)			
	Riser (R)	Going (G)	Quantity (2R + G)
Maximum	190	355	700
Minimum	115	250	550

23. Clause D2.14 – Landings

The dimensions and gradients of landings in stairways are set out in this clause; the configuration will depend on the proposed use of a building.

Landing surfaces must be slip resistant OR have slip resistant nosings not less than that listed in Table D2.14 when tested in accordance with AS4586.

Comments: Architect to note – see notes under D2.13 above.

Application	Surface conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or landing surface	P3 or R10	P4 or R11

24. Clause D2.15 – Thresholds

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless –

- (i) the doorway opens to a road or open space, external stair landing or external balcony; and
- (ii) the door sill is not more than 190mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.

Comments: Architect to note, details demonstrating compliance will be required to be included in the CC plans for all proposed door openings that are to be included in the proposed warehouse extension.

25. Clause D2.16 – Balustrades or Other Barriers

This clause details where balustrades are required to be provided and sets out in specific detail the construction requirements in sub-clauses (a) to (i) and Tables D2.16(a), D2.16(b) & D2.16(c).

- + Balustrades are required where the fall to the level below is more than 1m in height. The minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp.
- + For a fall of more than 4m to the surface level below, a window sill must be a minimum of 865mm in height above the height of the floor surface.
- + Where the floor is more than 4m above the surface beneath the balustrade any horizontal or near horizontal members between 150mm and 760mm above the floor must not facilitate climbing. The exception to this is within fire isolated exits within the building, or within a Class 7 (other than carparks) or 8 building.
- + Balustrades must be constructed so as to not permit a sphere of 125mm diameter to pass through. The exception to this is within fire isolated exits within the building, or within a class 7 or 8 building,



where the rails can be positioned a maximum of 460mm apart, so long as a bottom rail is located so a sphere of 150mm cannot pass through the opening between the nosing of the stair treads and the rail or between the floor of the landing, balcony or the like.

Comments: The above provisions may apply to the proposed new equipment installations in the building – see notes under D2.13 above – details demonstrating compliance are to be provided at the CC Application stage..

26. Clause D2.17 – Handrails

This Clause sets out the requirements regarding the location, spacing and extent of handrails required to be installed in buildings.

Comments: Details of the proposed handrails to the proposed stairs are to be provided for assessment with the CC application – see notes under D2.13 above.

27. Clause D2.20 – Swinging Doors

A swinging door in a required exit or forming part of a required exit must be installed to the requirements of sub-clauses (a), (b) & (c). This clause only applies to swinging doors in doorways serving a required exit or forming part of a required exit. It does not apply to other doorways – see notes in the Guide to the BCA.

Comments: The proposed exit doors serving the building are required to swing in the direction of egress in accordance with D2.20(a) – compliance is readily achievable.

28. Clause D2.21 – Operation of Latch

A door in a required exit or forming part of a required exit and in a 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 downward action or pushing action on a single device which is located between 900mm & 1.1m from the floor. This clause prohibits the use of devices such as deadlocks and knobs where knobs must be operated in a twisting motion in accordance with sub-clauses (a) & (b). D2.21 also sets out exceptions in relation to buildings where special security arrangements are required in relation to the uses carried out.

Comments: Architect to note. The proposed exit doors and doors in a path of travel to an exit are required to comply with the above requirements – compliance is readily achievable.

ACCESS FOR PEOPLE WITH A DISABILITY (incl. DDA ACCESS TO PREMISES STANDARD)

29. Clause D3.2 – Access to Buildings

This part requires accessways to be provided to accessible buildings from the main points of pedestrian entry at the allotment boundary and any accessible car parking space or accessible associated buildings connected by a pedestrian link.

Comments: Compliant Access is required to the main office entry and throughout the proposed office portion of the building in accordance with AS1428.1-2009. Refer to D3.3 and D3.4 for comments in relation to compliance requirements and any areas of exemption to this requirement.

30. Clause D3.3 – Parts of the Building to be Accessible

This part specifies the requirements for accessways within buildings which must be accessible.

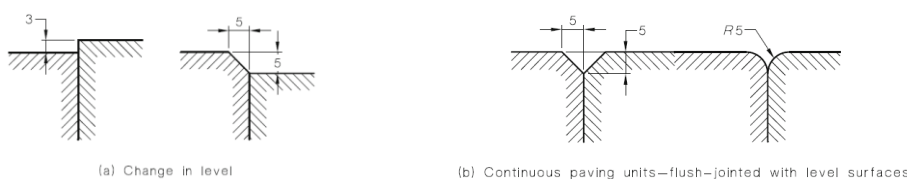
Comments: As indicated above, the proposed office area in the building extension is required to be accessible throughout in accordance with AS1428.1-2009. It is noted that compliance with the requirements of D3.3 and AS 1428.1-2009 is readily achievable; however, details and design certification will be required to be provided at CC Application stage (as applicable).

The following is a summary of some of the key matters which need to be considered from Clause D3.3 and AS 1428.1-2009:

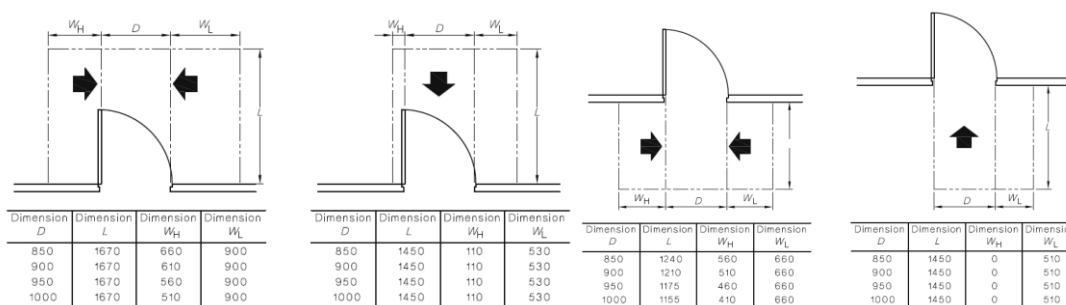
- + *The minimum width of any new accessible doorways must have a clear opening width of not less than 850mm in accordance with AS1428.1.*
- + *All new doorways on a continuous path of travel shall have a minimum luminance contrast of 30% provided between: door leaf and door jamb; or door leaf and adjacent wall; or architrave and wall; or door leaf and architrave; or door jamb and adjacent wall. The minimum width of the area of luminance contrast shall be 50mm.*
- + *Clause D3.3(g) and (h) requires that the pile height or pile thickness shall not exceed 11mm and the carpet backing thickness shall not exceed 4mm. Moreover, the carpet pile height or pile thickness dimension shall not exceed 11mm, the carpet backing thickness dimension shall not exceed 4mm and their combined dimension shall not exceed 15mm.*



- + Turning Spaces and Passing Spaces in all areas are required to be provided in accordance with Clauses 6.4 & 6.5 of AS 1428.1-2009.
- + All door handles and related hardware to swinging doorways are required to be a type 'D' handle which allows the door to be unlocked and opened with one hand in accordance with Clause 13.5.2.
- + All new internal surfaces are required to have a slip-resistant surface and the texture of the surface shall be traversable by persons with a disability pursuant to Section 7.1 of AS1428.1-2009:
 - i. Internal finishes and coverings (i.e. vinyl and tiles) are required to achieve a slip resistance classification under wet & dry conditions to comply with AS/NZS 4586-2004 'Slip Resistance Classification of New Pedestrian Surface Materials'.
 - ii. All finished vertically abutting floor surfaces are to be trip free, the following details demonstrate the tolerance level for floor finishes:



- + Circulation space to the new doorways that are required to be accessible are to comply with Section 13 of AS1428.1-2009, see examples below:



Circulation space requirements at doorways

- + Turning Spaces and Passing Spaces in all new accessible areas are required to be provided in accordance with Clauses 6.4 & 6.5 of AS 1428.1-2009.

31. Clause D3.4 – Exemptions

This part provides exemptions to the Deemed-to-Satisfy provisions for access by people with a disability. This part provides details on buildings or parts of buildings not required to be accessible under the BCA where providing access would be inappropriate because of the nature of the area or the tasks undertaken.

Comments: It is recommended that confirmation be obtained from Brickworks as to whether consideration to an exemption for the Existing Kiln / New Production Building extension (on health & safety risk basis) may be appropriate. If an exemption is proposed, the provisions of Part D3 do not apply, and a letter will be required from Brickworks confirming the proposed exemption at the CC stage.

32. Clause D3.6 – Signage

This section provides requirements for signage in buildings required to be accessible By Part D3.

Comments: Signage will be required to identify new exits, accessible facilities, an ambulant accessible facility and the paths to accessible pedestrian entries to the new office portion of the building (unless an exemption is proposed under D3.4).

33. Clause D3.8 – Tactile Indicators

This clause provides for the installation of tactile indicators in buildings required to be accessible and must be provided to warn people who are blind or have a vision impairment that they are approaching a stairway, escalator, passenger conveyor, ramp, overhead obstruction or an accessway meeting a vehicular way, except for areas exempted by D3.4.



Comments: Compliant tactile indicators are required in all new office portions of the building to all paths approaching a driveway and any overhead obstructions less than 2m in height (unless an exemption is proposed under D3.4).

SECTION E – SERVICES AND EQUIPMENT

FIRE FIGHTING EQUIPEMENT

34. Clause E1.3 – Fire hydrants

E1.3(a) – A fire hydrant system must be provided to serve a building having a total floor area greater than 500m² and where a fire brigade is available to attend a building fire.

E1.3(b) – Requires that the fire hydrant system must be installed in accordance with the provisions of AS2419.1 and also details where internal hydrants must be located.

Comments: The proposed building extension (including the existing portions of the building) is required to be served by a compliant hydrant system incorporating a ring main. Details demonstrating that the proposed hydrant system achieves compliance with the provisions of E1.3 & AS2419.1-2005 are required to be provided at CC Application stage. Note: The location of the proposed booster assembly adjacent to the main entry from Ferrers Rd will require the provision of a Performance Solution from the Fire Engineer as it does not comply with AS 2419.1-2005.

35. Clause E1.4 – Fire hose reels

A fire hose reel system must be provided to serve a building where one or more internal fire hydrants are installed or in a building with a floor area greater than 500m².

This clause requires that the fire hose reel system must be installed in accordance with AS 2441 and sets out the detail for location and uses of fire hose reels.

Comments: The proposed building extension is required to be served by a compliant fire hose reel system, with the exception of the new office area that is the subject of a concession. Details demonstrating compliance are to be provided at the CC application stage.

36. Clause E1.5 – Sprinklers

A sprinkler system must be installed in a building or part of a building when required by Table E1.5 and comply with Specification E1.5. Table E1.5 sets out which types of building occupancies and Classes which require to have sprinkler systems installed in them.

Specification E1.5 sets out requirements for the design and installation of sprinkler systems.

Comments: It is noted that the existing Kiln Building and New Production Building extension are not proposed to be fully sprinkler protected throughout in accordance with the Large Isolated Building requirements of Clause C2.3 and Table E1.5. It is noted that the lack of sprinkler protection to the building is to be the subject of a Performance Solution by the Fire Engineer.

37. Clause E1.6 – Portable fire extinguishers

Portable fire extinguishers must be provided as listed in Table E1.6 and must be selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444.

Comments: Fire extinguishers will be required to be installed in the proposed building extension (including within the Class 5 Office area) in accordance with Table E1.6 & AS 2444.

38. Clause E1.8 – Fire Control Centres

A fire control centre facility in accordance with Specification E1.8 must be provided for a building having an effective height of more than 25m and in a Class 6, 7, 8 or 9 building with a total floor area of more than 18,000m².

Specification E1.8 describes the construction and content of required fire control centres or rooms.

Comments: It is noted that the existing building and proposed building extension has a floor area that exceeds 18,000m² and is such it is required to be provided with a Fire Control Centre that complies with the provisions of Clause 2-5 of Spec. E1.8. Details demonstrating compliance are to be provided with the CC Application. Note: If the FCC is proposed to be located in the existing office building at the main site entry a Performance Solution is likely to be required.



SMOKE HAZARD MANAGEMENT

39. Clause E2.2 – General Requirements

Class 2 to 9 buildings must comply with the provisions of this Clause to remove smoke during a fire, to control the operation of air handling systems and to prevent the spread of smoke between compartments.

Buildings must comply with the provisions of **Table E2.2a**, as applicable to Class 2 to 9 buildings. It deals with the design and construction of air handling systems that are part of a smoke hazard management system and air handling system that are not part of a smoke hazard management system.

The details relating to the installation and operation of the systems are set out in **Specifications E2.2a, E2.2b** and **E2.2c**.

Comments: As the floor area / volume of the extended Large Isolated Building exceeds 18,000 m² / 108,000m³ and the ceiling height of the new Production Building is more than 12m, an automatic smoke exhaust system is required to be installed in accordance with Specification E2.2b. It is noted that a Performance Solution to rationalise this requirement will be proposed by the Fire Engineer.

EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

40. Clause E4.2 – Emergency Lighting Requirements

This clause details when emergency lighting must be installed in Class 2 to 9 buildings. The requirements for buildings and parts of buildings are detailed in sub-clauses (a) to (i) and each sub-clause must be considered as more than one may apply to any single building

Comments: Emergency Lighting is required throughout the building in accordance with E4.2, E4.4 and AS/NZS 2293.1-2005.

41. Clause E4.4 – Design & Operation of Emergency Lighting

Every required emergency lighting system must comply with AS2293.1.

Comments: Electrical Consultant to note.

42. Clause E4.5 – Exit Signs

An exit sign must be clearly visible to persons approaching the exit and must be installed on, above or adjacent to each door providing egress from a building. Sub-clauses (a) to (d) set out the situations where exit signs are required to be installed.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans.

43. Clause E4.6 – Direction Signs

If an exit is not readily apparent to persons occupying or visiting the building then exit signs must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a required exit.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans.

44. Clause E4.8 – Design & Operation of Exit Signs

Every required exit sign must comply with AS/NZS 2293.1 and be clearly visible at all times when the building is occupied by any person having the legal right of entry into the building.

Comments: Electrical Consultant to note, details demonstrating compliance will be required to be included in the CC plans.

SECTION F – HEALTH & AMENITY

DAMP AND WEATHERPROOFING

45. Performance Requirement FP1.4

A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause

- a) Unhealthy or dangerous conditions, or loss of amenity for occupants; and
- b) Undue dampness or deterioration of building elements.



Note 1: There are no Deemed-to-Satisfy provisions for this Performance Requirement in respect to External Walls.

Note 2: Refer to Clause F1.5 for roof coverings.

Comments: Design statement and a documented Performance Solution is to be provided with the Construction Certificate application, either by using:

- + The Verification Methods in Clause FV1; or
- + Other verification methods deemed acceptable by the Certifier; or
- + Evidence to support that the use of the material or product, form of construction or design meets the Performance Requirements or the DTS provisions, such as a Certificate of Conformity (e.g. CodeMark); or
- + By way of Expert Judgement.

46. Clause F1.1 – Stormwater drainage

Stormwater drainage must comply with AS/NZ 3500.3.

Comments: Design certification for all new stormwater works will be required to be submitted with the CC & CDC application.

47. Clause F1.5 – Roof Coverings

This clause details the materials and appropriate standards, with which roofs must be covered with. The roofing requirements are set out in sub-clauses (a), (b) (c), (d), (e) & (f) which set out the types of materials that may be used and the adopted Australian Standards that apply to their quality and installation.

Comments: Note.

48. Clause F1.6 – Sarking

Sarking-type materials used for weatherproofing of roofs must comply with AS/NZS 4200 parts 1 and 2.

Comments: Note.

49. Clause F1.7 – Waterproofing of Wet Areas

This clause requires that wet areas in Class 2 to 9 buildings must be waterproofed. It prescribes the standards to which the work must be carried out in sub-clauses (a) to (e) with emphasis in sub-clauses (c), (d) & (e) on the construction of rooms containing urinals and their installation.

Note: Figures F1.7(1) & F1.7(2) of the Guide to the BCA contain diagrams indicating the areas of walls and floors to be protected around baths, washbasins and showers.

Comments: Note.

SANITARY AND OTHER FACILITIES

50. Clause F2.3 – Facilities in Class 3 to 9 Buildings

This clause provides the requirements for sanitary facilities to be installed in Class 3, 5, 6, 7, 8 and 9 buildings in accordance with Table F2.3. The requirements and variations are set out in sub-clauses (a) to (h).

Comments: As referenced under D1.13 above the population numbers of the facility will need to be confirmed by Brickworks in order to confirm compliance with Table F2.3. It is noted however, the proposed sanitary facilities in the building are considered to be more than adequate and as such compliance is readily achievable.

51. Clause F2.4 – Accessible Sanitary Facilities

Accessible unisex sanitary compartments must be provided, in accordance with **Table F2.4(a)** and unisex showers must be provided in accordance with **Table F2.4(b)**, in buildings or parts that are required to be accessible. The details for the provision of disabled facilities and the standard, AS 1428.1, are set out in sub-clauses (a) to (i).

Comments: The configuration of the proposed sanitary facilities in the new office area results in only one of the three banks of toilets being provided with an accessible sanitary facility and ambulant sanitary facilities. This configuration may require a Performance Solution from an Access Consultant or a further D3.4 concession may need to be considered for the sanitary facility serving the new Production area.



52. Clause F2.5 – Construction of Sanitary Compartments

- (a) Other than in an early childhood centre sanitary compartments must have doors and partitions that separate adjacent compartments and extend –
- (i) from floor level to the ceiling in the case of a unisex facility; or
 - (ii) a height of not less than 1.5m above the floor if primary school children are the principal users; or
 - (iii) 1.8 above the floor in all other cases.
- (b) The door to a fully enclosed sanitary compartment must-
- (i) open outwards; or
 - (ii) slide; or
 - (iii) be readily removable from the outside of the sanitary compartment,

unless there is a clear space of at least 1.2m, measured in accordance with **Figure F2.5** between the closet pan within the sanitary compartment and the doorway.

Comments: Details demonstrating compliance are to be submitted with documentation for the CC Application.

ROOM HEIGHTS

53. Clause F3.1 – Height of Rooms and Other Spaces

The ceiling heights in Class 2 to 9 buildings must not be less than required in sub-clauses (a) to (f) of this clause. The minimum ceiling heights for a Class 5, 7 & 8 building are as follows:

- + Corridor or Passage, Bathroom, storeroom, etc. – 2.1m;
- + Remainder – 2.4m.

Comments: Architect to ensure compliance. Ceiling heights to be reviewed at the CC application stage with the detailed section drawings.

LIGHT AND VENTILATION

54. Clause F4.4 – Artificial Lighting

Artificial lighting is required where it is necessary to minimise the hazard to occupants during an emergency evacuation. Sub-clauses (a), (b) & (c) sets out the places where artificial lighting is always required in all classes of buildings and the standard to which it must be installed.

Comments: Design certification for all proposed new lighting to be submitted at CC Application Stage.

55. Clause F4.5 – Ventilation of Rooms

A habitable room, office, shop, factory, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have natural ventilation complying with F4.6 or a mechanical or air-conditioning system complying with AS1668.2 and AS/NZS 3666.1.

Note: NSW F4.5(b) a mechanical ventilation or air-conditioning system complying with AS 1668.2 – the reference to AS/NZS 2666.1 is deleted from the BCA in NSW as the need to comply with this standard is regulated under the relevant section of the Public Health Act 1991.

Comments: Design certification confirming that the proposed ventilation to the building is compliant with F4.5 is to be submitted at CC Stage.

SECTION J – ENERGY EFFICIENCY

56. Part J1 – Building Fabric

The provision of insulation of the building envelope will be required in the proposed Building, in accordance with **Clauses J1.0 to J1.6**, and the **Tables therein**, including Thermal Construction General, Roof and Ceiling Construction, Rooflights, Walls, and Floors. Design details and/or certification of design will be required to be provided in this regard.

Comments: This section applies to any air-conditioned spaces proposed within the office portion of the building. Design details and/or certification of building envelope design will be required to be submitted with the application for a Construction Certificate.

57. Part J2 – Glazing

Glazing within the external building envelope will be required to be assessed/designed to achieve compliance with **Clauses J2.0 to J2.5**, including the **Tables therein**, having regard to the maximum



aggregate air-conditioning energy attributable to each façade of the proposed building. A calculation demonstrating that the proposed design of the building complies with the requirements of **Part J2** is required to be provided in this regard.

*Comments: This section applies to any air-conditioned spaces proposed within the office portion of the building. A calculation demonstrating that the proposed design of the glazing in the eastern façade and internal walls to the production area complies with the requirements of **Part J2** is required to be submitted with the application for a Construction Certificate.*

58. Part J3 – Building Sealing

The proposed building envelope will be required to be sealed to prevent air infiltration in accordance with the requirements of **Clauses J3.0 to J3.6**. Details or certification that the proposed building design complies with the requirements of **Part J3** is required to be provided.

*Comments: This section applies to any air-conditioned spaces proposed within the office portion of the building. Details or certification that the proposed design complies with the requirements of **Part J3** will need to be submitted with the application for a Construction Certificate.*

59. Part J5 – Air-Conditioning & Ventilation Systems

Details and/or design certification which confirm that any proposed air-conditioning system or unit within the proposed building achieves compliance with the relevant requirements of **Part J5** will be required to be provided from the mechanical engineer.

Comments: Consultant certification required at CC Application Stage.

60. Part J6 – Artificial Light & Power

Details and/or design certification which confirm that all artificial lighting, power control, and boiling/chilled water units within the proposed building achieves compliance with the relevant requirements of **Part J6** will be required to be provided from the electrical engineer.

Comments: Consultant certification required at CC Application Stage.

61. Part J7 – Hot Water Supply, & Swimming Pool & Spa Pool Plant

Details and/or design certification which confirm that any proposed hot water supply system within the proposed building achieves compliance with the relevant requirements of **Part J7** (Section 8 of AS 3500.4) will be required to be provided from the hydraulic engineer.

Comments: Consultant certification required at CC Application Stage.

62. Part J8 – Facilities for Energy Monitoring

Provision for monitoring of energy consumption must be provided to a building where the floor area exceeds 500m² and must be capable of recording the consumption of gas and electricity. In addition, where the floor area of the building exceeds 2,500m² the energy monitoring facilities must be capable of individually recording air-conditioning, lighting, appliance power, central hot water supply, lifts/escalators, and other ancillary plant.

Comments: Consultant certification required at CC Application Stage. In this regard particular attention is drawn to the provisions of Clause J8.3 for energy monitoring.



D. CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed extension to the existing Austral Bricks Plant No.2 Kiln/Production building located at 174-181 Ferrers Rd, Horsley Park, against the Deemed-to-Satisfy Provisions of the BCA 2019. Arising from the review, it is considered that the development can readily achieve compliance with the relevant provisions of the BCA.

The following fire safety measures are required for the Kiln/Production Building:

Essential Fire and Other Safety Measures	Standard of Performance
Automatic Fire Suppression System**	BCA Spec. E1.5 & AS 2118.1 – 1999 (<i>and Performance Solution by the Fire Engineer</i>)
Building Occupant Warning System activated by the Sprinkler System	BCA Spec E1.5 Clause 8 and/ or Clause 3.22 of AS 1670.1 – 2015
Emergency Lighting	BCA Clause E4.4 & AS/NZS 2293.1 – 2005
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
Fire Control Centre	BCA Spec. E1.8
Fire Hose Reels (<i>Class 7b/8</i>)	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	BCA Clause E1.3 & AS 2419.1 – 2005 (<i>and Performance Solution by the Fire Engineer</i>)
Paths of Travel	EP & A Regulation Clause 186 (<i>and Performance Solution by the Fire Engineer</i>)
Perimeter Vehicular Access	BCA Clause C2.4 (<i>and Performance Solution by the Fire Engineer</i>)
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Smoke Hazard Management Systems	BCA Part E2 & AS/NZS 1668.1 – 2015 (<i>and Performance Solution by the Fire Engineer</i>)



Appendix 1

Table 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building—FRL: (in minutes)			
	<u>Structural adequacy/ Integrity/ Insulation</u>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any <u>fire-source feature</u> to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	-/-/-	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
3 m or more	-/-/-	-/-/-	-/-/-	-/-/-
EXTERNAL COLUMN not incorporated in an <u>external wall</u> , where the distance from any <u>fire-source feature</u> to which it is exposed is—				
Less than 1.5 m	90/-/-	90/-/-	90/-/-	90/-/-
1.5 to less than 3 m	-/-/-	60/-/-	60/-/-	60/-/-
3 m or more	-/-/-	-/-/-	-/-/-	-/-/-
COMMON WALLS and FIRE WALLS—				
	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS-				
Bounding <u>public corridors</u> , public lobbies and the like—	60 / 60/ 60	-/-/-	-/-/-	-/-/-
Between or bounding <u>sole-occupancy units</u> —	60/ 60/ 60	-/-/-	-/-/-	-/-/-
Bounding a stair if <u>required</u> to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS				
	-/-/-	-/-/-	-/-/-	-/-/-