BLACKETT MAGUIRE+ GOLDSMITH

BCA ASSESSMENT REPORT

PROPOSED BRICKMAKING PLANT

416 BERRIMA ROAD, MOSS VALE

PREPARED FOR:

BRICKWORKS

Revision 1

Date: 09.06.2020

Project No.: 190394

Address
Suite 2.01,
22-36 Mountain St
Ultimo NSW 2007

Contact
Ph: 02 9211 7777
Fax: 02 9211 7774

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REPORT STATUS				
DATE	**REVISION**	**STATUS**	**AUTHOR**	**REVIEWED**
14.04.2020	0	Preliminary Assessment – For client & consultant review	DG	TH
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Prepared by:

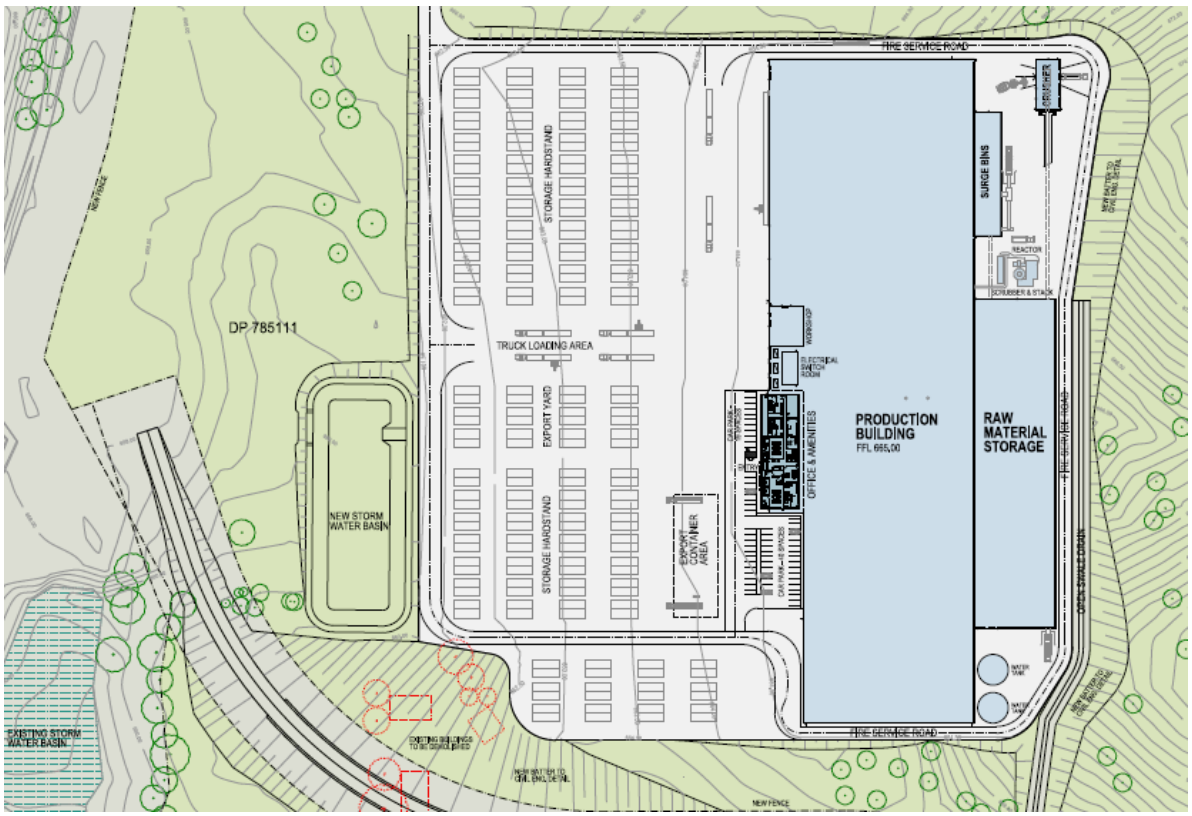
Dean Goldsmith
Director
Blackett Maguire + Goldsmith

A. INTRODUCTION

A.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Brickworks to undertake a preliminary review of the proposed development, against the deemed-to-satisfy (DTS) provisions of the Building Code of Australia 2019 (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 involves the construction of a new brickmaking manufacturing plant building including the production facility, workshop, raw materials shed, surge bins enclosure, crusher building, admin office and laboratory, export yard and container area, truck loading areas, external carpark, and associated external structures and civil works.



Source: SBA Architectural Drawing No. DA 102 A dated 18.02.2020

A.2 AIM

The aim of this report is to:

- Undertake an assessment of the proposed industrial facility against the Deemed-to-Satisfy (DtS) Provisions of the BCA 2019 to identify the key issues ONLY. A further more detailed report will be required upon refinement of the Architectural plans prior to a Construction Certificate being issued.

A.3 PROJECT TEAM

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

- Assessment – Dean Goldsmith (Director) & Sabine Blakeman (Building Surveyor – Cadet)
- 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	A	18.02.2020	DA111	A	18.02.2020
DA102	A	18.02.2020	DA201	A	18.02.2020
DA103	A	18.02.2020	DA202	A	18.02.2020
DA104	A	18.02.2020	DA211	A	18.02.2020

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.

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.
- 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.
- No part of this document may be reproduced in any form or by any means without written permission from BM+G Pty Ltd. This report is based solely on client instructions, and therefore, should not be used by any third party without prior knowledge of such instructions.
- This report is intended to cover the key issues associated with the masterplan of the site and as such, separate BCA assessment reports will be required to be undertaken for each building individually.

A.7 Terminology

Performance 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 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 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 proposed development:

▪ **BCA Class:**	Class 5 – Office/Lab Class 7b – Warehouse / Raw Materials Storage Class 8 – Production Building / Crusher Building
▪ **Rise in Storeys:**	One (1)
▪ **Effective Height:**	Less than 12m
▪ **Type of Construction:**	Type C Construction
▪ **Climate Zone:**	Zone 6
▪ **Maximum Floor Area** ▪ **Maximum Volume:**	Greater than 18,000m^2 Greater than 108,000m^3 Note: The building is designated as a Large Isolated Building under BCA Clause C2.3.

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 proposed brickmaking plant facility.

SECTION B- STRUCTURE

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 balustrading (dead and live loads)
3. AS 1170.2 – 2011, Wind Actions

4. AS 1170.4 – 2007, Earthquake Actions in Australia
5. AS 3700 – 2018, Masonry Structures
6. AS 3600 – 2018, Concrete Structures
7. AS 4100 – 1998, Steel Structures
8. AS 4600 – 2018, Cold Formed Steel Structures.
9. AS 2159 – 2009, Piling – Design and Installation
10. AS 1720.1 – 2010, Design of Timber Structure
11. AS/NZS 1664.1 and 2 – 1997, Aluminium Structures
12. AS 2047 – 2014, Windows and External Glazed Doors in Buildings
13. AS 1288 – 2006, Glass in Buildings - Selection and Installation

Comments: Structural design details and certification will be required at CC application stage.

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 the proposed building as it has a rise in storeys of one (1) – see notes under Spec. C1.1 below.

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: The building has a rise in storeys of one (1).

4. 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 application stage and installation certification (including relevant test reports confirming the critical radiant flux of floor linings and group number of wall and ceiling linings) required at OC stage.

COMPARTMENTATION AND SEPARATION

5. 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 proposed building 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 Warehouse.

6. Clause C2.3 – Large Isolated Buildings

A Large Isolated Building that contains Class 5, 6, 7, 8 or 9 parts, is required to be—

(i) protected throughout with a sprinkler system complying with Specification E1.5; and

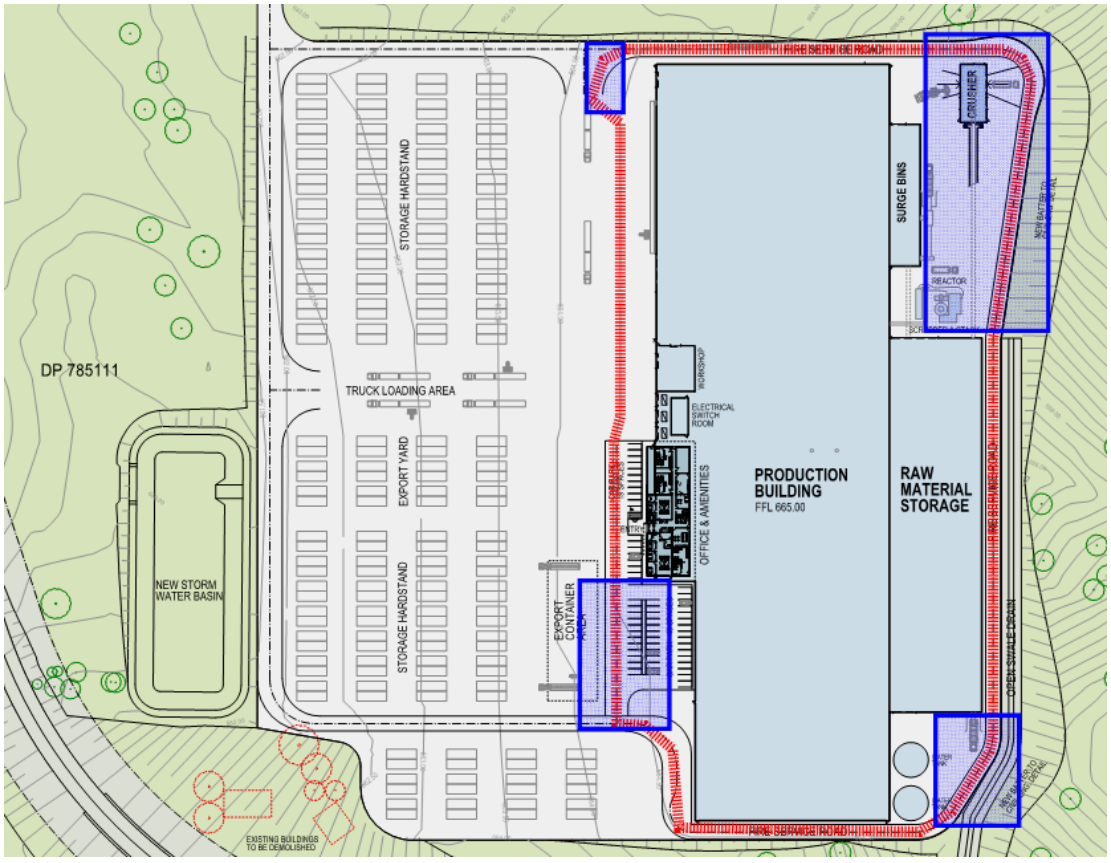
(ii) provided with a perimeter vehicular access complying with C2.4(b).

Comments: The proposed building 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.

7. 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 proposed building complies with the provisions of C2.4 with the exception of the areas identified in blue in the following mark-up where the furthest part of the perimeter vehicular access path is greater than 18m from the external walls of the building:



In this regard, the above non-compliance is required to be addressed as a Performance Solution by the Fire Safety Engineer to demonstrate compliance with Performance Requirement CP9.

Note: The road providing vehicular perimeter access must be designed with adequate loading capacities to withstand a fire truck.

8. 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.

Comments: C2.8(a) can be applied to the building as the different classifications have the same FRL requirements under Table 5 of Spec. C1.1.

9. 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.

Comments: Where appropriate, details demonstrating compliance are to be included in the CC Application plans for the proposed building. It is noted that no equipment per the above list is currently shown on the plans referenced under section A.4 of this report.

10. Clause C2.13 – Electricity Supply System

To ensure certain types of electrical equipment to operate during an emergency the requirements of sub-clauses (a), (b), (c), (d) & (e) must be complied with relating to sub-stations, sub-mains and main switchboards.

(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) Having any doorway in that construction protected with a self-closing fire door having an FRL of not less then -/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.
  (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 straight 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

Comments: Where appropriate, details demonstrating compliance are to be included in the CC Application plans for the proposed building. It is noted that no equipment per the above list is currently shown on the plans referenced under section A.4 of this report.

PROTECTION OF OPENINGS

11. Clause C3.15 – Openings for Services Installations

All openings 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 C2.12/ C2.13 requirements for fire rated enclosures above.

SPECIFICATIONS

12. Specification C1.1 – Fire Resisting Construction

The new building works are required to comply with the requirements detailed under Table 5 of Specification C1.1 for Type C Construction. In this regard the proposed building elements are required to comply.

Comments: Given the location of the building on the site there are no fire rating requirements in Table 5 of Spec. C1.1 that are applicable to the project.

13. 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.

14. Specification C1.11 – Performance of External Walls in Fire

This specification contains measures to minimise in the event of fire the likelihood of external walls collapsing outwards as complete panels and the likelihood of panels separating from supporting members.

Comments: Structural Design certification and details demonstrating compliance are required to be provided at CC Application stage.

SECTION D – ACCESS & EGRESS

PROVISION FOR ESCAPE

15. 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 building are considered to be non-compliant with the requirements of Clause D1.4 in the following areas:

- *Production Area – approximately 80m to an exit from the central parts of the building assuming two egress paths are available around all equipment. In addition, Exit Travel Distances from the eastern side of Production area directly adjacent to the Raw Materials Shed could be up to 110m-115m depending upon the layout of the proposed equipment directly adjacent to this area and the available egress routes through the Raw Materials Shed.*

Detailed equipment layout plans identifying the egress paths are required for assessment at the CC stage to confirm the extent of the above non-compliance which will need to be addressed as a Performance Solution prepared by the Fire Safety Engineer to demonstrate compliance with Performance Requirements DP4 & EP2.2.

Note 1: Compliant travel distances are readily achievable from the office portion of the building.

Note 2: There are no designated exit locations shown on the plans from the Raw Materials Shed or the Surge Bins enclosure. Details are to be provided at CC Application stage to confirm if the abovementioned Performance Solutions for extended exit travel distances will also apply to these parts of the building.

16. 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 are considered non-compliant with the provisions of D1.5 in the following areas:

- *Production Area – the distance between alternative exits is up to 140m from the central parts of the building assuming 2 egress paths are available around all equipment. In addition, the distances between alternative exits from the eastern side of Production area directly adjacent to the Raw Materials Shed could be up to 225m depending upon the layout of the proposed equipment directly adjacent to this area and the available egress routes through the Raw Materials Shed.*

Per the comments under Clause D1.4 above, detailed plans showing the egress paths through the plant areas are required for assessment to confirm the extent of non-compliance which will be required to be addressed as a Performance Solution prepared by the Fire Safety Engineer to demonstrate compliance with Performance Requirements DP4 & EP2.2.

Note 1: Compliant distance between alternative exits in the office parts of the building is readily achievable.

Note 2: As per Note 2 – further details of the exit locations in the Raw Materials Shed and Surge Bins enclosure are required

17. 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: Population numbers for the building will be required to be provided by Brickworks at the CC Application stage to facilitate an assessment of the provisions of D1.6. In this regard, however, it is considered that compliance is readily achievable.

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

18. 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 building are required to be protected in accordance with the requirements of this clause.

19. 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: Population numbers are required to be provided by Brickworks for the different parts of the building in order to facilitate an assessment of the required exit dimensions in accordance with Clause D1.6 above and sanitary facilities in accordance with Clause F2.3 below.

CONSTRUCTION OF EXITS

20. 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 are to be enclosed in non-combustible materials and are to be suitably sealed against the spread of smoke.

21. 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.

Comments: Any proposed stairs with the Production Area, Raw Materials Shed or Crusher Building are to be designed with compliant dimensions per Table D2.13 below, have solid risers, and are to have contrasting nosings, 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.

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

Note: Where AS1657 compliant ladders/stairs are proposed around the plant and equipment in the production area, a Performance Solution may be required – refer to additional comments under Clause D2.18 below.

22. 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 surfaces OR slip resistant nosing not less than that listed in Table D2.14 (below) when tested in accordance with AS4586.

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
Nosing or landing edge strip	P3	P4

Comments: Details to be confirmed with the occupation certificate documentation where applicable.

23. 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.

24. 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. Typically, the following will apply to this class of building:

+ 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 eth 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 could facilitate climbing.

+ 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 7b 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: Details of the proposed balustrades to proposed stairs or platforms within the Production Area, Raw Materials Shed or Crusher Building are to be provided with the application for the construction certificate for assessment detailing compliance with the above requirements.

25. 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 proposed stairs or platforms within the Production Area, Raw Materials Shed or Crusher Building are to be provided with the application for the construction certificate for assessment detailing compliance with the above requirements.

26. Clause D2.18 – Fixed Platforms, Walkways, Stairways and ladders

A fixed platform, walkway, stairway, ladder, any going and riser, any balustrade or other barrier attached thereto may comply with AS1657 if it only serves a machinery or plant room or non-habitable part of a sole-occupancy unit in a Class 2 building or Class 4 part.

Comments: Note. If AS1657 compliant platforms, walkways, stairways and ladders are proposed to serve any areas other than machinery rooms, plant rooms or the like, a Performance Solution will be required from the Architect or Fire Engineer.

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 egress doors 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. Details demonstrating compliance will be required to be included in the CC plans.

ACCESS FOR PEOPLE WITH A DISABILITY

29. Clause D3.1 – General Building Access Requirements

The extent of access required depends on the classification of the building.

Office, Warehouse & Production Building: Access is required to and within all areas normally used by the occupants, for Class 5, 7b & 8 buildings – refer to comments under D3.2 & D3.3 below in this regard.

Comments: Access is required to and within all areas normally used by occupants with the exception of areas exempted by Clause D3.4 – refer comments below.

30. 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 to all areas in the proposed building in accordance with AS 1428.1-2009. Refer to D3.3 and D3.4 below.

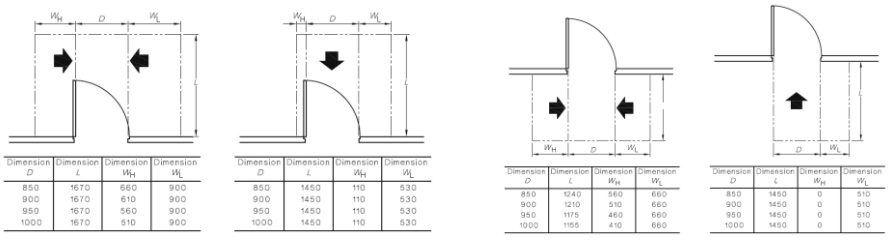
31. Clause D3.3 – Parts of the Building to be Accessible

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

Comments: As indicated above, the proposed building is required to be accessible throughout in accordance with AS1428.1-2009. In addition to the matters outlined below, compliant access is also required to be provided from the main pedestrian entry to the site from the footpath/allotment boundary, through to the main entry, from any accessible parking spaces on the site to the main entry. It is noted that compliance with the requirements of D3.3 and AS 1428.1-2009 is readily achievable however, there is no pedestrian access from the street currently shown on the site plan. Details and design certification will be required to be provided at CC Application stage confirming compliance with the above and below requirements or a Performance Solution from an Access Consultant will be required.

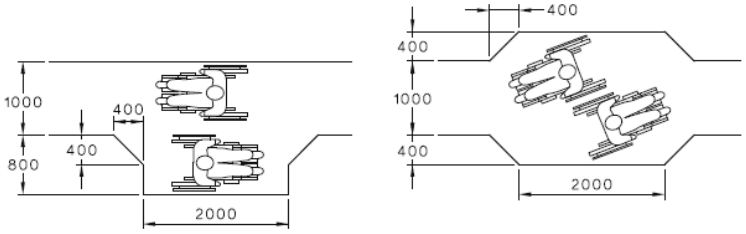
The following is a summary of some of the key matters which need to be considered from Clause D3.3 and AS 1428.1-2009:

- *Access for persons with disabilities must be provided, at a minimum, to and within all areas normally used by the occupants, subject to the D3.4 concessions discussed below.*
- *The minimum width of an accessible doorway must have a clear opening width of not less than 850mm in accordance with AS1428.1.*
- *All 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.*
- *Circulation space to the new doorways that are required to be accessible are to comply with Section 13 of AS1428.1-2009, as detailed below:*



Circulation space requirements at doorways

- *Turning Spaces and Passing Spaces in all areas within the office are required to be provided in accordance with Clauses 6.4 & 6.5 of AS 1428.1-2009.*



32. 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 advice be obtained from an accredited Access Consultant at the CC Application stage, however, consideration to an exemption for the production areas (on health & safety risk basis) may be appropriate on this project. Confirmation from Brickworks will be required that includes a request for concession, where this would be applied and the reasons why it would be inappropriate for access for people with disabilities within the facility.

33. Clause D3.5 – Accessible Carparking

This part provides details of the number of accessible carparking spaces required in a carpark depending on the classification of the building.

Comments: In the case of Class 5, 7b & 8 building, 1 compliant accessible space is required for every 100 parking spaces or part thereof. The proposed accessible parking shown on the site plan achieves compliance with Clause D3.5.

34. 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 accessible facilities, an ambulant accessible facility and the paths to accessible pedestrian entries (where required).

35. 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 areas of the building to all ramps, stairs, paths approaching a driveway and any overhead obstructions less than 2m in height.

36. Clause D3.11 – Ramps

Ramps may be used as part of an accessway where there is a change of level and must comply with the requirements set out in AS1428.1.

Comments: Architect to note. Details demonstrating compliance will be required to be included in the CC plans.

37.Clause D3.12 – Glazing on an Accessway

On an accessway, where there is no chair rail handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.

Comments: Glazing capable of being mistaken for an opening as listed above must be clearly marked for its full width with a solid and non-transparent contrasting line being not less than 75mm wide and the lower edge must be located between 900mm and 1000mm above the plane of the finished floor level.

SECTION E – SERVICES AND EQUIPMENT

FIRE FIGHTING EQUIPEMENT

38. 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 is required to be served by a compliant hydrant system incorporating a ring main. Details demonstrating compliance with the provisions of AS 2419.1-2005 are required to be provided at CC Application stage.

Hydrant booster assemblies are required to be accessible to the brigade, located within sight of the main entry of the building and either greater than 10m from the building or affixed to the external wall of the building and protected by construction having an FRL of not less than 90/90/90 extending 2m each side and 3m above the assembly.

Where the location of the hydrant booster departs from the above provisions or rationalised protection to external hydrants is proposed, these non-compliances will need to be addressed as a Fire Engineered Performance Solution to demonstrate compliance with Performance Requirement EP1.3.

Additionally, if access to any enclosed plant room is proposed to be restricted, consideration may be given to the omission of hydrant coverage to this area which will also need to be the subject of a Performance Solution from the Fire Engineer.

Note: Consultation with the Fire Engineer and Hydraulic Consultant should be carried out regarding FRNSW's requirements to allow progressive movement of fire fighters towards the central parts of the building i.e. when working from an external hydrant, the next additional hydrant should not be more than 50m from the external hydrant, and when working from an internal hydrant, the next additional hydrant should be located not more than 25m from that hydrant.

39. 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 is required to be served by a compliant fire hose reel system in the Class 8 & 7b portions of the but not in the Class 5 Office – see E1.6 requirements in relation to the office. Details demonstrating compliance are to be provided at the CC application stage.

Additionally, as indicated in E1.3 above, if access to any enclosed plant is proposed to be restricted, consideration may be given to the omission of fire hose reel coverage to this area which will also need to be the subject of a Performance Solution from the Fire Engineer.

40. 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: The proposed Large Isolated Building is required to be sprinkler protected throughout in order to address the requirements of Clause C2.3 and Table E1.5. Details demonstrating compliance with AS2118.1 - 2017 are to be provided at the CC application stage.

41. 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 in accordance with Table E1.6. Note: Additional Portable Extinguisher requirements are applicable to the Class 5 Office portion of the building in lieu of fire hose reels.

42. 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: The proposed industrial building exceeds 18,000m² and as such is required to be provided with a Fire Control Centre that complies with Clauses 2-5 of BCA Spec. E1.8. Details demonstrating compliance are to be included on the CC Application plans.

SMOKE HAZARD MANAGEMENT

43. 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 building is greater than 18,000m² & 108,000m³ and the ceiling height of the fire compartment exceeds 12m, an automatic smoke exhaust system in accordance with Spec E2.2b is required. In this regard, consideration may be given to a Performance Solution to the required smoke hazard management requirements and in turn any such Performance Solution will need to be prepared by the Fire Engineer and will need to demonstrate compliance with Performance Requirement EP2.2.

EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

44. 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.

45. 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.

46. 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.

Note: NSW E4.6.

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

47. 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 (eg. CodeMark); or*
- *By way of Expert Judgement.*

48. Clause F1.1 – Stormwater Drainage

Stormwater drainage must comply with AS/NZ 3500.3.

Comments: Details of stormwater disposal are required to be prepared by a suitably qualified consultant and submitted with documentation for the CC.

49. 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.

50. Clause F1.6 – Sarking

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

Comments: Note.

51. 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

52. Clause F2.2 – Calculation of Number of Occupants & Facilities

This clause sets out the requirements for the calculation of the number of occupants and the number of sanitary facilities required to be installed in Class 2 to 9 buildings. The parameters for the calculation are set out in sub-clauses (a) to (d).

Comments: Noted – refer to D1.13.

53. 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)-(h).

Comments: As indicated under Clause D1.13 above the proposed population numbers are to be provided by Brickworks to assess if the proposed toilet facilities within the building are adequate to achieve compliance with Table F2.3. Notwithstanding, the proposed sanitary facilities as detailed below are considered to be able to readily achieve compliance with Table F2.3 given the likely low population numbers in the building:

- *Males – 8 Closet Pans, 6 Urinals, 8 Washbasins;*
- *Females – 6 Closet Pans, 5 Washbasins.*

54. 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 disable facilities and the standard, AS 1428.1, are set out in sub-clauses (a) to (i).

Comments: An accessible unisex sanitary compartment complying with AS1428.1-2009 is required adjacent to the bank of sanitary facilities, and where more than 1 bank of sanitary facilities is provided, to not less than 50% of all banks of toilets throughout the proposed building in accordance with Table F2.4(a). Additionally, a sanitary compartment suitable for persons with an ambulant disability is required for use by males and females at each bank of sanitary facilities where there is an accessible unisex sanitary compartment in accordance with AS1428.1-2009. The proposed design is compliant with these requirements, however, details demonstrating that the design of each facility complies with AS 1428.1 are to be provided at CC application stage.

55. 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.

56. 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 buildings 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, however compliance is readily achievable.

LIGHT AND VENTILATION

57. 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 to be submitted at CC Application Stage.

58. 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 to be submitted at CC Stage.

SECTION J – ENERGY EFFICIENCY

59. Part J1 – Building Fabric

The provision of insulation and glazing to 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 building including the office. Design details and/or certification of building envelope design will be required to be submitted with the application for a Construction Certificate.

60. 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 building including the office. 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.*

61. 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.

62. 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.

63. 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 where applicable.

64. 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.

C. CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed Brickmaking Plant at 416 Berrima Road, Moss Vale against the Deemed-to-Satisfy Provisions of the BCA 2019. Arising from the review, it is considered that the proposed development can readily achieve compliance with the relevant provisions of the BCA. Where compliance matters are proposed to comply with the Performance Requirements (rather than DtS Provisions), the development of a Performance Solution Report will be required prior to the issue of the Construction Certificate.

The following fire safety measures are required for the new building works:

Statutory Fire Safety Measure	Design / Installation Standard
Alarm Signaling Equipment	AS 1670.3 – 2004
Automatic Fail-Safe Devices	BCA Clause D2.21
Automatic Smoke Detection System	BCA Spec. E2.2a & AS 1668.1 – 2015
Automatic Fire Suppression Systems	BCA Spec. E1.5 & AS 2118.1 – 2017
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 2293.1 – 2005
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8; and AS 2293.1 – 2005
Fire Control Centre	BCA Spec E1.8
Fire Doors	BCA Clause C2.12, C2.13 and AS 1905.1 – 2015 and manufacturer's specification
Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
Fire Hydrant Systems	Clause E1.3 & AS 2419.1 – 2005
Fire Seals	BCA Clause C3.15, AS 1530.4 – 2014 & AS 4072.1 – 2005 and manufacturer's specification
Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999 and manufacturer's specification
Mechanical Air Handling Systems	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
Paths of Travel	EP&A Regulation Clause 186
Perimeter Vehicular Access	BCA Clause C2.4
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Smoke Hazard Management Systems (Automatic Smoke Exhaust System)	BCA Part E2 & AS/NZS 1668.1–2015
Warning & Operational Signs	Section 183 of the EP&A Regulation 2000, AS 1905.1 – 2015, BCA Clause D3.6

APPENDIX 1

Table 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building—FRL: (in minutes)			
	Structural adequacy/ Integrity/ Insulation			
	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 *fire-source feature* 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 *external wall*, where the distance from any *fire-source feature* 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 *public corridors*, public lobbies and the like—	60 / 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–