BUILDING CODE OF AUSTRALIA REPORT

Revision: D September 2018

Plasser Australia Workshop – Alterations and Additions
2 Plasser Crescent, St Mary's

Prepared for: Plasser Australia Pty. Ltd
C/- Group GSA

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Date	Rev No	No. of Pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
29.06.18	A	23	Final	Zac Wilkins	Brigitte Thearle	02.07.18
05.07.18	B	23	Final	Zac Wilkins	Geoff Pearce	17.07.18
14.09.18	C	23	Final	Zac Wilkins	Geoff Pearce	14.09.18
17.09.18	D	23	Final	Zac Wilkins	Brigitte Thearle	17.09.18

Executive Summary

Development Overview

The proposed development is internal alterations to the office and workshop change room facilities, and alterations/extension to the existing paint workshop to extend the roof and install new spray booths.

Compliance Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Group GSA (refer appendix A) for compliance with the Building Code of Australia 2016 Amendment 1.

In this regard the following areas in particular require further review as the project develops:

No.	Items for review	Responsibility
1.	Please advise if there are any proposed alternative building solutions with regard to design of the building services for the project.	Services Consultants
2.	Fire service drawings required to be submitted confirming locations of all proposed fire services infrastructure relevant to the scope	Fire services engineer
3.	Any proposed plant room containing equipment as specified in C2.12 of the BCA to be detailed on plans, to confirm adequate fire separation requirements as per clause	Service consultants

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction Certificate will need to include verification from a suitably accredited fire engineer: -

No.	Alternative Solution Description	DTS Clause	Performance Requirement
Fire Safety Items			
1.	**Fire Hose Reels** Fire Hose Reel must be located with 4m to an exit. Current design shows the FHR located 6m from the exit.	E1.4	EP1.1
Accessibility Items			
2.	**Parts of building to be accessible** Turning space required within 2m of the end of accessway where it is not possible to continue travelling along the accessway in the office area at the end of corridor 2	D3.3	DP4, DP6

1.0 Introduction

The proposed development comprises of internal and external alterations of the existing Plasser Australia Worksop

This report is based upon the review of the design documentation listed in Appendix A of this Report and previous works conducted by McKenzie Group completed in 2015.

The report is intended as an overview of the relevant provisions of the Building Code of Australia for assistance only. Detailed drawings and associated review will still be required as the final design is developed.

It has been assumed for the purpose of this report that a compliant fire wall will be constructed to separate the paint work shop (both new and existing) from the existing warehouse.

1.1 Current Legislation

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is version that in place at the time of the application to the Certifying authority for the Construction Certificate. For the purposes of this Report, BCA 2016 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

1.2 Upgrade to Existing Buildings

The local authority when assessing the development application may require that the existing building be brought into partial on full compliance with the current provisions at the BCA. The trigger for upgrade includes:

- Where the building works, together with any other works completed or authorised within the previous 3 years, represents more than half the total volume of the building; or

- Council are not satisfied the measures contained in the building are not adequate for the safety of present using the building or prevention of special to adjacent buildings.

Further investigations, including a site inspection will be required to ascertain the extent of the upgrade works required for the existing building to ensure that a suitable level of life safety, health and amenity for the occupants within the building is maintained. The upgrade works will be based upon using the current regulations as an applicable benchmark and our expertise to judge what is considered to be suitable.

Notwithstanding the above, where practical benefits and improvements to fire and life safety can be achieved without major cost or disruption, it is recommended that the relevant compliance parameters be upgraded to meet current requirements where possible.

The ‘factory Warehouse’ has an existing Fire Engineering Report. Summary of alternative solutions below:

Report number – 20048_FER_03

- Travel distance to an exit, between alternative exits and to a point of choice shall comply with DTS provisions with the following exceptions:-
    - Within the factory building travel distances from the centre of the service pit is up to 55m to the nearest exit

- Reduction of fire resistant construction of external walls in Factory Building

- Eastern Wall: The external eastern wall is non-loadbearing, with columns internal to the building being load bearing. The distance between the factory building and the existing building will be elevated compared to a DTS design.
- Southern Wall: The Covered Work Area that creates the Fire Source Feature to the south will be open to the air for at least 1/3 of the perimeter, creating a free venting environment, the distance from the Southern wall to the nearest fire source feature then becomes greater than 18m, and not requiring an FRL to be applied to the external walls. The internal columns are not required to achieve an FRL under type B construction
- Western Wall: on the opposite side of the site boundary sits Plasser Crescent, and to the far side of the road the distance is greater than 18m from the Western Wall of the new building. From this, the distance to a likely fire source shall be shown to be greater than 18m, thus equivalent to a DTS design not requiring fire rating.

2.0 PRELIMINARIES

2.1 Building Assessment Data

Summary of Construction Determination: -

Part of Project	Building 1
Classification	5 & 8
Number of Storeys	2
Rise In Storeys	2
Type of Construction	A*
Effective Height (m)	12m

Type A due to compartment sizes.

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population
Office refit	5	674m²	1617m³	10
Paint Workshop	8	674m²	8088m³	13
Existing Workshop	8	3334m²	40008m³	66

Notes:
1. Population confirmed by Group GSA via email on 5 July 2018

2.2 Structural Provisions BCA B1

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided, including determination of the importance level of the development.

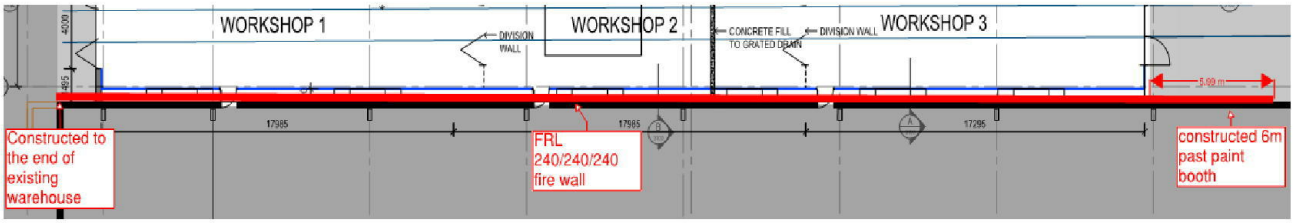
3.0 FIRE PROTECTION

3.1 Fire Compartmentation BCA C1.1

The BCA stipulates three levels of fire resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C2.2.

Based upon the rise in storeys and use of the Building, the building is required to be Type A Construction in accordance with Table 3 & 3.9 of Specification C1.1 of the Building Code of Australia 2016 Amdt 1.

To negate the need for the building being assessed as a large isolated building, the paint work shop has been assessed as a separate fire compartment. The required fire wall between the paint work shop and the existing warehouse is required to achieve an FRL of -/240/240, as shown in the diagram below.



Note – the fire wall is to extend 6m past the external wall of the paint shop, as required by C3.3

Should the fire wall not comply with the requirements above, the building will be assessed as large isolated and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA specifications E1.5 throughout the development / smoke detection and alarm system in accordance with AS1670,
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter,
- Smoke exhaust or smoke and heat vents required throughout the development
- Provisions of a hydrant ring main to be installed

Note – the building does not comply with requirements for perimeter vehicle access and this would need to be assessed on a performance, and the fire engineer would need to confirm feasibility.

3.4 Fire Resistance BCA C1.1

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction, Please refer to Appendix C which outlines the required fire rating to be achieved by the development. These fire ratings are summarised below:-

Building Element	5	8
External Walls	120/120/120	240/240/240
External Columns	120/-/-	240/-/-
Fire Walls	120/120/120	240/240/240
Fire Stair / Shaft Walls	120/120/120	240/120/120

Public Corridors Loadbearing Non-loadbearing	 120/-/- -/-/-	 240/-/- -/-/-
Roof	-/-/-	-/-/-

3.5 Fire Hazard Properties BCA C1.10 and BCA C1.12

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to specification C1.10 Building Code of Australia. The following requirements apply:

Non-Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than 2.2 a maximum smoke development rate of 750 percent-minutes
b) Wall and Ceiling Linings – Material Group No. 1,2,3 and with a smoke growth rate index not more than 100, or an average specific extinction area less than 250m2/kg
c) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8 (if Spread of Flame if >5)

Rigid and flexible air handling ductwork must comply with AS4254 parts 1 & 2 2012.

3.8 Protection of Openings in External Walls BCA C3.2

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the fire source feature requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

Where a building is separated into fire compartments, the distance between parts of external walls and openings within them must be not less than the table below unless those parts of each external wall has an FRL not less than 60/60/60 and openings are protected.

Angle Between Walls	Minimum Distance
0° (walls opposite)	6m
More than 0° to 45°	5m
More than 45° to 90°	4m
More than 90° to 135°	3m
More than 135° to 180°	2m
More than 180°	Nil

Openings from the existing paint workshop and proposed spray booths to the existing Workshop are understood to be located in adjoining compartments. These openings are to be protected where they are within the distances nominated in the above table.

Fire source feature is defined as;

a) *The far boundary of a road, river, lake or the like adjoining an allotment,*
b) *The side or rear boundary of the allotment,*
c) *The external wall of another building on the allotment which is not a class 10 building.*

4.0 EGRESS PROVISIONS

4.1 Provisions for Escape BCA D1

The egress provisions from the proposed building are provided by:

- External perimeter doorways

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation

4.3 Exit Travel Distances BCA D1.4

The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would be satisfied.

The travel distances to exits should not exceed:

Class 5-9

- 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- Exits shall be located to not be more than 60m apart and not closer than 9m

The locations of the proposed exits indicate that the deemed to satisfy requirements in terms of travel distances would be satisfied for the proposed works.

4.4 Dimensions of Exits BCA D1.6

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657 in which case a 600mm clear width is required).

Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm, with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

5.0 ACCESS FOR PEOPLE WITH DISABILITIES

5.1 General Building Access Requirements BCA D3.1

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2016. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4-2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Access for persons with a disability is to be provided as follows:-

Office/shops (Class 5/Class 6 buildings)

To and within all areas normally used by the occupants

Warehouse and production/Manufacturing facilities

To and within all areas normally used by the occupants, but as the uses of these areas could be deemed inappropriate, confirmation is required as the appropriateness of the areas in question by the owners or tenant.

5.2 Provision for Access to Buildings

The BCA prescribes access to be provided to and within the building as follows:

- Via the principle public entry and at least 50% of all other entrances
- From designated car parking spaces for the use of occupants with a disability.
- From another accessible building connected by a pedestrian link.
- All areas used by the public.

In buildings over 500m² in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

And where a pedestrian entry contains multiple doors, the following is required;

- Entrance containing not more than 3 doors, at least one of the door leaves must be accessible.
- Where an entrance contains more than 3 doors, not less than 50% of the door leaves must be accessible.

It is anticipated that the paint workshop will be considered under an exemption from providing access for people with disabilities, as the following areas are suitable for exemption:

(a) An area where access would be inappropriate because of the particular purpose for which the area is used.
(b) An area that would pose a health or safety risk for people with disability.
(c) Any path of travel providing access only to an area exempted by (a) or (b).

Documentation is to be provided where this area is required to be considered under an exemption. This documentation is to include the job description for people who will be occupying this area and how the area meets the above requirements.

5.3 Provisions for Access within Buildings BCA D3.3

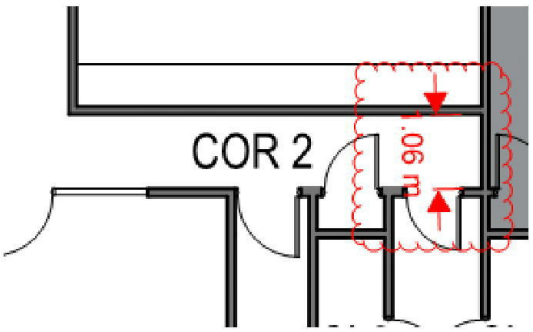
A building required to be accessible is required to be equipped with either an AS1428.1 compliant lift or 1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3 and as attached in appendix 1;
- Doorways must have a clear opening of 850mm;
- Passing spaces (1.8m wide passages) must be provided at maximum of 20m intervals
- Within 2.0m of end access ways/corridors, turning areas spaces are required to be provided.
- Carpet pile height of not more than 11mm to an adjacent surface
- Any glazed capable of being mistaken for a doorway or opening must be clearly marked (or contain chair rail, hand rail or transom as per AS 1288 requirements)

The design would generally comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

Turning space required within 2m of the end of accessway in the office area at the end of corridor 2.



5.9 Provisions for Accessible Sanitary Facilities BCA F2.4

Unisex Accessible Sanitary Facilities

An accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only and provided in accordance with AS 1428.1-2009 and must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary towels and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
Office, industrial	a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant Facilities

At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1-2009 must be provided for use by males and females.

Where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.

A accessible unisex sanitary compartment or an accessible unisex shower need not be provided on a storey or level that is not provided with a passenger lift or ramp complying with AS1428.1-2009

5.10 Signage BCA D3.6

As part of the detailed design package, specifications will need to be developed indicating:

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number

6.0 FIRE SERVICES AND EQUIPMENT

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures. A draft essential fire safety schedule can be found in Appendix B.

6.1 Fire Hydrants BCA E1.3

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005 is required to be provided, please provide pressure and flow calculations for review.

The Final Fire Safety Certificate confirms that a Fire Hydrant System is installed in the building in accordance with BCA E1.3, AS2419.1-2005

The Hydraulic Engineer is to provide confirmation that that the proposed changes to the internal configuration to the building are consistent with outcomes of their original assessment. Furthermore, the Hydraulic Engineer is to confirm that the Fire Hydrant coverage and required pressures and flows can be achieved for the proposed extension.

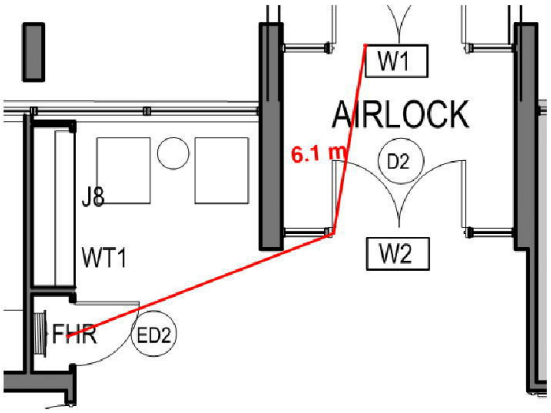
6.2 Fire Hose Reels BCA E1.4

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005

Fire hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length. Where required, additional fire hose reels shall be located internally as required to provide coverage.

Existing fire hose reel system is to be extended to provide coverage to the new areas. Furthermore, the existing system is to be reviewed to ensure coverage is maintained to all existing portions and hose reels remain in compliant locations.

Current design of the office layout shows the Fire Hose Reel located 6m from the exit. The Fire Hose Reel is required to be relocated, alternatively address in a Fire Engineering Solution.



6.3 Fire Extinguishers

The provision of portable fire extinguishers is required to BCA Clause E1.6 and AS2444-2001 to provide coverage.

Table E.6 details when portable fire extinguishers are required:

General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	(a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) (b) To cover Class F fire risks involving cooking oils and fats in kitchens. (c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles). (d) To cover Class A fire risks in normally occupied fire compartments less than 500m^2 not provided with fire hose reels (excluding open deck carparks)

Fire extinguishers are to be located in accordance with AS 2444, often collocated with fire hydrants and/or fire hose reels.

6.5 Exit Signs and Emergency Lighting BCA E4.2 and BCA E4.5

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with AS2293.1-2005

Exit signs are expected to exceed the maximum height of 2.7m in the paint booth alterations. Where the exit signs exceed 2.7m in height, they are to be assessed as part of the performance solution to BCA Performance Requirement EP4.2 by the accredited fire safety engineer.

Details are required to be provided for review.

9.0 Health and Amenity

9.1 Sanitary Facilities — BCA F2.2 and BCA F2.3

Offices & Worksop

The sanitary & other facilities within the development would generally consist of: -

Sanitary Facilities Provided In Office Area			
	WC	Urinals	Basins
Male	1 + Ambulant	1	1
Female	2 + Ambulant	-	2
Accessible	1		1
The Above Facilities are adequate for 60 males & 60 females which is sufficient for the population numbers provided (100 people)			
Sanitary Facilities Provided In Workshop Area			
Male	**7**	**7**	**7**
Female	**-**	**-**	**-**
Accessible	**-**	**-**	**-**
The Above Facilities are adequate for 140 males & 0 females			

Note:
1. The Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

Details are to be provided confirming if there is proposed to be any population increase as a result of the work. Furthermore, information as to the gender split in the warehouse is to be provided to ensure adequate facilities.

Bathroom Construction

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges.

9.3 Light and Ventilation — BCA Part F4

Natural Ventilation is required to be provided to rooms at a rate of 5% of the floor area in openings. Alternatively, mechanical ventilation is required in accordance with AS1668.2-2012

Artificial lighting complying with AS/NZS1680.0-2009 is to be incorporated with the final detailed design to be developed to confirm this.

10.0 Energy Efficiency

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
    - Building Fabric

- Glazing
- Building Sealing
- Air Conditioning & Ventilation Systems
- Artificial Lighting & Power
- Hot Water Supply

2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a climate zone 6.

Due to special nature of the building some energy provisions may not be appropriate.

10.8 Access for Maintenance

Access if to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

Appendix A - Design Documentation

The following documentation was used in the assessment and preparation of this report: -

Drawing No.	Title	Date	Drawn By	Revision
1000	Site Plan	-	Group GSA	1
2000	Paint Workshop Demolition Plan	-	Group GSA	1
2001	Paint Workshop Plan	-	Group GSA	B
2002	Paint Workshop Roof Plan	-	Group GSA	1
2003	Office Demolition Plan	-	Group GSA	1
2004	Office Group Floor Plan	-	Group GSA	A
3000	Paint Workshop Elevations and Sections	-	Group GSA	1

Appendix B – Existing Fire Safety Schedule

(Pursuant to Clause 168 of the Environmental Planning and Assessment Regulation 2000)

	Essential Fire Safety Measures	Standard of Performance
1.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670.1 – 2004, AS/NZS 1668.1 - 1998
2.	Building Occupant Warning System	BCA Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2004 – Clause 3.22
3.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
4.	Emergency Evacuation Plan	AS 3745 – 2002
5.	Exit Signs	BCA Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005
6.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
7.	Fire Hydrant System	BCA Clause E1.3 & AS 2419.1 – 2005
8.	Paths of Travel	EP&A Reg 2000 Clause 186 & Fire Engineering Report prepared by Raw Fire 20048_FER_02 dated 2 December 2014. - Within the factory building there is potential for travel distances from the service pit to be extended up to 55m to the nearest of two alternative exits (when a train carriage blocks the two inner most access ladders).
9.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
10.	Fire engineering report prepared by Raw Fire 20048_FER_02, dated 2 December 2014.	- As part of the Alternative Solution the Covered Work area shall be considered as open space as defined in the BCA. This will be carried forward to determine the prescriptive requirements when assessing compliance with the BCA DTS provisions. - The walls of the Factory Building and the Covered Work Area are not required to achieve an FRL. - The structure shall be designed such that local failure of the covered area will fall away and not cause failure of the existing building or new factory building structure. - The northern external wall (between the existing building and the new factory building) shall be open to allow free venting. Should security measures be required in this part, then a chain mesh fence/gate may be provided.

	Essential Fire Safety Measures	Standard of Performance
		- Any downturn in the roof covering at the edges of the work area shall not be lower than the highest part any roller shutter opening in the adjacent buildings

Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2016:

Table 3 TYPE A 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—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
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 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion—				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240

ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60