

BUILDING CODE OF AUSTRALIA REPORT FOR ACO POLYCRETE FACILITY

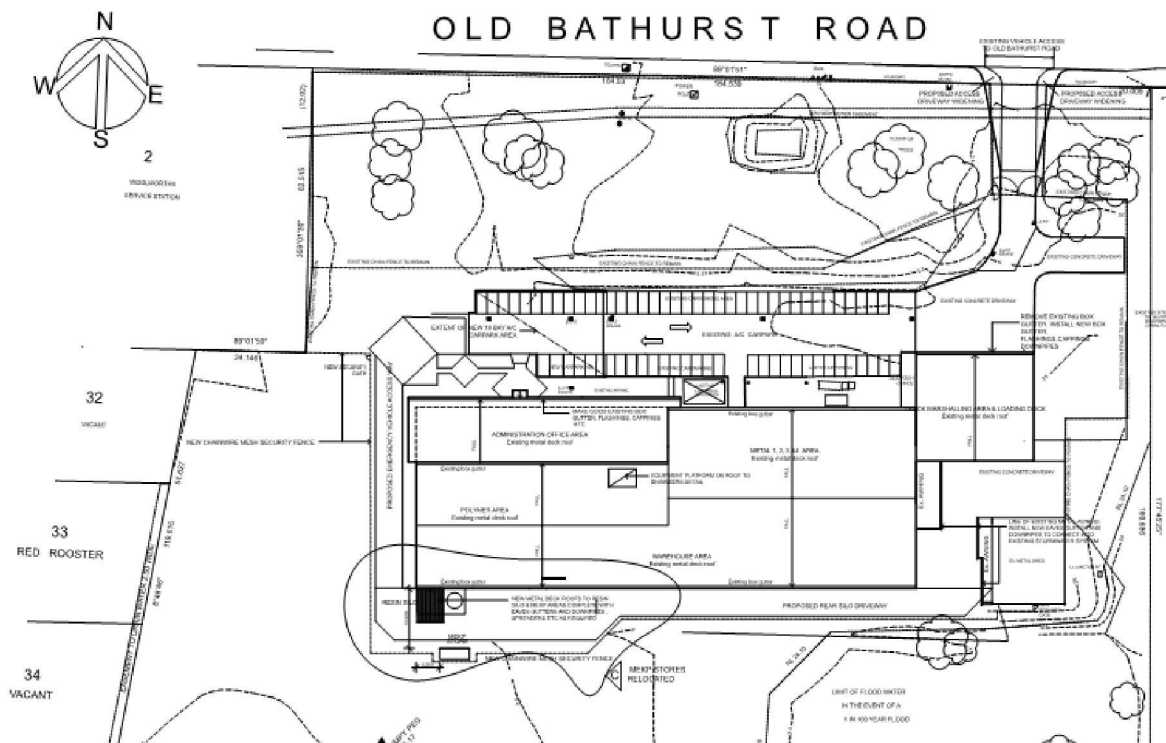
134 -140 OLD BATHURST ROAD, EMU PLAINS

Report prepared for: ACO Polycrete
 134 -140 Old Bathurst Road,
 Emu Plains NSW 2750
 Contact: Sean Duff

Report prepared by: Philip Chun Building Code
 Suite 404, 44 Hampden Road
 Artarmon NSW 2064
 Contact: Philip Smillie

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DOCUMENT ACCEPTANCE

	Name	Signed	Date
Prepared by	Philip Smillie	<i>Philip Smillie</i>	16/8/19

REVISION HISTORY

Revision No.	Prepared by	Description	Date
R01	Philip Smillie	BCA Report	16/8/19



1.0 SCOPE

Introduction and Documentation

At the request of ACO Poly Crete this commission involves an assessment of the existing two storey ACO Manufacturing Facility and Office premises located at 134 -140 Old Bathurst Road, Emu Plains.

It is advised that we have inspected the facility on 9 August 2019 with respect to its compliance with the fire safety provisions contained within the Building Code of Australia 2019 (BCA). We have made every attempt to cover the main issues under Parts C, D and E of the BCA to bring to the attention of the client any areas of major regulatory concern.

Methodology is principally inspection of the building and perusal of the available documentation for the building. In areas where access could not readily be available, assumptions may have been made to aid the client. These assumptions have been made with the understanding that findings according to the inspection of particular components have been indicative of conditions of similar components.

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1.1 Limitations and exclusions

This report is based upon a walkthrough site inspection of the building only conducted on 9 August 2019.

Adequacy of the individual building services was not fully assessed and particular mention must be made to:

- Structural adequacy including the performance of the external walls and internal bounding walls, adequacy of roofs has not been assessed.
- Mechanical air handling systems and status of operation in fire mode – systems not tested and installation dates not known. The assessment of existing mechanical systems in the building is not addressed and shall be provided by Mechanical Service Consultant.
- Electrical services adequacy – is beyond the scope of this report. It was noted that emergency and exit lighting has been installed.
- Hydraulic services adequacy – is beyond the scope of this report.
- The contents of this report reflect only the findings noted at the time of the inspection.

1.2 Issue of building approvals and certifications

The issue of Building Approvals for the building does not totally guarantee the building's compliance to the current regulations. It should be noted that many buildings have variations to the BCA.

The issue of the yearly certification for the building for the essential services also does not warrant the compliance of the systems or services but merely acknowledges that the services have been maintained relatively in accordance with an acceptable Australian Standard or Building Code at the time the building was constructed.

1.3 Future upgrade and works

There are few areas of the current legislation that require a building to be upgraded to comply with the most current requirements and the four conditions that commonly prevail are:

1. The building would undergo a change of use;
2. The building is to undergo a major refurbishment that entails greater than 50% of the building volume and / or floor area;



3. If the building is deemed by the authorities and / or the Fire Brigade to be unsafe in terms of fire and life safety;
4. The building may undergo a strata subdivision.

Therefore in assessing the above scenarios and likelihood of their application the following legislation applies depending on the scope of work to the building and we comment as follows:

1. Change of Use

Environmental Planning and Assessment Regulation 2000– Clause 93 Fire safety considerations

(1) This clause applies to a development application for a change of building use for an existing building, where the applicant does not seek the rebuilding, alteration, enlargement or extension of a building.

(2) In determining the development application, the consent authority is to take into consideration whether the fire protection and structural capacity of the building will be appropriate to the building's proposed new use.

*(3) Consent to the change of building use sought by a development application to which this clause applies must not be granted unless **the consent authority** is satisfied that the building complies (or will, when completed, comply) with such of the Category 1 fire safety provisions as are applicable to the building's proposed new use. Note. The obligation to comply with the Category 1 fire safety provisions may require building work to be carried out even though none is proposed or required in relation to the relevant development consent.*

2. Major refurbishment

Clause 94 of EPA Regulation 2000 - Consent authorities may require buildings to be upgraded

(1) This clause applies to a development application for development comprising the rebuilding, alteration, enlargement or extension of an existing building where:

- (a) the proposed building work, together with any other building work completed or authorised within the previous 3 years, represents more than half the total volume of the building, as it was before any such work was commenced, measured over its roof and external walls, or*
- (b) the measures contained in the building are inadequate: (i) to protect persons using the building, and to facilitate their egress from the building, in the event of fire, or (ii) to restrict the spread of fire from the building to other buildings nearby.*

*(2) In determining a development application to which this clause applies, **a consent authority** is to take into consideration whether it would be appropriate to require the existing building to be brought into total or partial conformity with the Building Code of Australia.*

(3) The matters prescribed by this clause are prescribed for the purposes of section 79C (1) (a) (iv) of the Act.

3. Fire Order by Council or New South Wales Fire Brigade

Environmental Planning and Assessment Act 1979

9.32 *Special provision with respect to fire brigades - (1) An authorised fire officer may exercise the functions conferred on a person authorised by a council under this Division for the purpose of inspecting a building to determine:*

- (a) whether or not adequate provision for fire safety has been made in or in connection with the building, or*



(b) whether or not such of the provisions of this or any other Act or law as may be prescribed for the purposes of this paragraph have been complied with.

9.34 Development Control Orders may be given by a consent authority as per schedule 5 (1) An order may be given to a person by:

(a) council, or

(b) any other person who exercises functions as a consent authority, except in relation to complying development for which a complying development certificate has been issued, to do or to refrain from doing a thing specified in the following Table if the circumstances specified opposite it in Column 2 of the Table exist and the person comes within the description opposite it in Column 3 of the Table.

Column 1 To do what?	Column 2 In what circumstances?	Column 3 To whom?
Part 2 Fire Safety Orders No. Order No.1 To do or stop doing things as are specified in the order so as to ensure or promote adequate fire safety or fire safety awareness	(a) Provisions for fire safety or fire safety awareness are not adequate to prevent fire, suppress fire or prevent the spread of fire or ensure or promote the safety of persons in the event of fire when lack of maintenance or use of the premises constitutes a significant fire hazard	Owner of premises or, in the case of a place of shared accommodation, the owner or manager

4. Strata subdivision

Council has the ability to determine the level of upgrade when a Development Application is submitted for determination. They have the capability of negotiating the upgrade works that they deem reasonable and be formulated based on each building's merit.

In this case we understand that Penrith City Council is seeking a report which addresses the terms of Clause 94 of the Environmental Planning and assessment Regulation 2000.

In this regard the applicable parts of the BCA to assess in terms of Fire Safety are Parts C, D and E.

2.0 BCA CLASSIFICATION AND BUILDING CHARACTERISTICS

The rise in storeys for the building is 2 and therefore required to be of not less than Type C Construction according to the requirements of the Building Code of Australia.

The subject floor area is approx. 5339m² and exceeds the fire compartment size limits for Type A construction. The building is sprinkler protected throughout and seeks to comply as a large isolated building, in which case Type C construction may be adopted.

However perimeter access for emergency vehicles is only available on 3 of 4 sides contrary to Clause C2.4(b).

The east side vehicle path passes under a sprinkler protected awning with a clearance of 4.5m.



An extract of the NSW Fire Brigades Guidelines for Emergency Vehicle Access is below and states that a 4.5m clearance height is required throughout the path. Whilst the subject building awning is not strictly a gateway, or overhanging structure, the Fire Brigade could still complete a full lap of the building.

5.5 Building and Structure Clearance Height

An unobstructed clearance height of 4.5m should be maintained above all access ways including clearance from building construction, archways, gateways/doorways and overhanging structures (e.g. ducts, pipes, sprinklers, walkways, signs, beams).

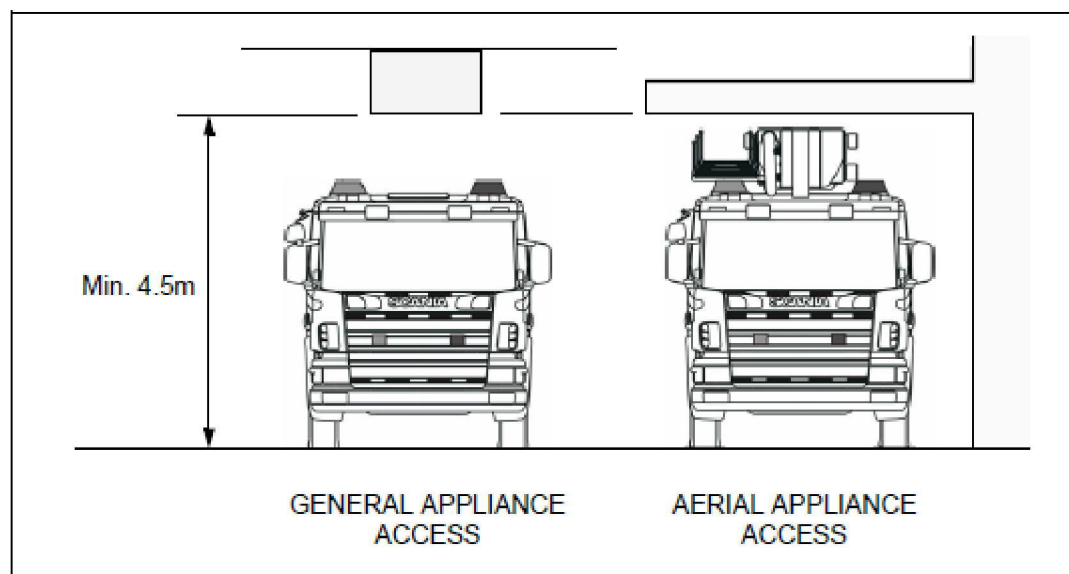


Figure 6 Building and Structure Clearance Heights



The following Building Code of Australia Classifications apply to each level of the building as follows:-

Level	Use	BCA Classification
Ground	Office, Factory	Class 5, Class 8
Level 1	Office, Amenities, Switchroom, Storage	Class 5, Class 8

The building is generally constructed of the following materials:

Floor construction:	Concrete to ground floor and part level 1, Steel plate to L1 storage
Structure:	Steel
Roof:	Metal

3.0 AUDIT AND COMPLIANCE CHECKLIST / RECOMMENDATIONS FOR UPGRADE

Identification of non-compliances and recommendations with respect to Parts C, D, & E of the BCA 2019, Volume 1 are made in **bold italicized text**.

Section C – Fire Resistance / Compartmentation / Separation

Part C1 - Fire Resistance and Stability

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation for upgrade
C1.1 - Type of Construction required.	The building is required to be of Type C Construction.	Complies	-
C1.2 - Calculation of rise in storeys.	Sum of the greatest number of storeys at any point.	Two (2) storeys.	-
C1.8 -Lightweight construction.	Lightweight construction must comply with Specification C1.1 if it is used in a wall system.	None observed on site	-
C1.10 - Fire Hazard Properties.	<p>Floor coverings, wall and ceiling linings to all levels need to have a Critical radiant Flux of not less than 2.2 kW/m² and a maximum smoke development rate of 750 percent-minute.</p> <p>Wall and ceiling linings must comply with the group number specified in Table 3 and have a smoke growth rate index not more than 100 or an average specific extinction area less than 250m²/kg.</p> <p>Air-handling ductwork must comply with AS4254 Parts 1 and 2.</p>	<p>Mostly concrete floors, with vinyl noted in the lunch room and carpet to offices.</p> <p>Air handling ductwork insulation smoke and fire indexes not known.</p>	<p>Seek to obtain manufacturers details if new flooring materials are to be installed in future.</p>



Part C2 - Compartmentation and Separation

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
C2.2 - General floor area and volume limitations.	<p>The following limitations apply according to the type of construction of the building (Type A Construction for this building).</p> <p>Class 7b - max floor area - 5000m² - max volume - 30000m³</p>	<p>Floor areas is approx. 5339m² Volume approx. 35,000m³ – exceeds C2.2 limits.</p>	<p>Seek to consider a large fire isolated building.</p>
C2.3 Large Isolated Buildings	<p>The building may have a floor area exceeding C2.2 limits if provided with perimeter vehicular access complying with C2.4(b)</p>	<p>Perimeter access for emergency vehicles is only available on 3 of 4 sides contrary to Clause C2.4(b).</p> <p>The east side vehicle path passes under a sprinkler protected awning with a clearance of 4.5m. See photo on Page 5.</p>	<p>At Councils discretion under Clause 94 of the EPAR 2000, a alternative solution could be undertaken addressing BCA performance Clause CP9.</p> <p>Alternatively a letter could be written to NSWFR advising them of the situation and requesting whether any modifications are necessary.</p>
C2.12 - Separation of equipment.	<p>Essential / emergency equipment including lift motor rooms, switch rooms, emergency generators, central smoke control plant, boilers or batteries are to be separated by fire rated construction with a fire resistance level as required by Specification C1.1 but not less than 120/120/120.</p>	<p>No such equipment appears present</p>	<p>Determine if a UPS battery is present. If so and it exceeds a total of 12V and 200 Kwh storage capacity, thence it should be fire separated from the remainder of the building. None noted.</p>
C2.13 - Electricity supply system.	<p>If the main switchboard supports any emergency equipment then it must be fire isolated with two-hour construction.</p> <p>Electricity substation to be separated by 120/120/120 construction.</p> <p>Where emergency equipment is required in a building, all switchboards in the electrical distribution system, which sustain the electricity supply to the emergency equipment, must provide full segregation by way of enclosed metal partitions designed to prevent the</p>	<p>Existing switchboards are not separated from remainder of floor area on L1.</p> <p>Assume they do not need to be unless otherwise advised.</p>	<p>Electrical consultant to determine whether the electrical boards on L1 noted on site power emergency equipment.</p>



BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
	<p>spread of any fault from non-emergency equipment switchgear to the emergency equipment switchgear. Emergency equipment includes;</p> <p>Fire hydrant booster pumps.</p> <p>(ii) Pumps for automatic sprinkler systems, water spray, chemical fluid suppression systems or the like.</p> <p>(iii) Pumps for fire hose reels where such pumps and fire hose reels form the sole means of fire protection in the building.</p> <p>(iv) Air handling systems designed to exhaust and control the spread of fire and smoke.</p> <p>(v) Emergency lifts.</p>		

Part C3 - Protection of Openings

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
C3.8 - Openings in fire-isolated exits.	Self closing -/60/30 fire doors are required to each fire stair entry at each level	Not applicable	-
C3.9 - Service penetrations in fire-isolated exits.	Not permitted if not part of the emergency services of the stair.	Not applicable	-
C3.12 - Openings in floors and ceilings for services.	Where a service passes through a floor that is required to have an FRL with respect to integrity the service must be protected by a shaft complying with Specification C1.1 or in accordance with Clause C3.15.	Not applicable	-
C3.13 - Openings in shafts.	All openings are to have tested FRL -/60/30 access panels or fire doors fitted. Garbage shaft hoppers can be of non-combustible construction.	Not applicable	-
C3.15 - Openings for service installations.	All penetrations must be fire sealed, fire rated or otherwise comply with listed standards.	Not applicable	-



Section D – Access and Egress


Part D1 - Provisions for Escape

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
D1.2 - Number of exits required.	A minimum of one exit per storey is required in the building for Class 2-9, and two exits required from all basement levels.	Complies.	-
D1.3 - When fire isolated stairs are required.	Fire isolated stairs are required when stair connects more than two floors.	Not applicable.	-
D1.4 - Exit travel distances	The maximum distance of travel to an exit is 40m where two exits are available with a point of choice at 20m from the point of origin.	Generally complies.	
D1.5 - Distance between alternative exits	The distance between alternative exits is not to exceed 60m. Paths shall not converge within 6m of each other at any point		
D1.6 - Width of exits.	The unobstructed width of each exit or path of travel to an exit, except for doorways, must be not less than 1m wide.	Complies	-
D1.7 - Travel via fire isolated exits.	Each fire-isolated stair must provide independent egress from each storey served and discharge directly by way of its own fire isolated passageway to a road or open space.	Not applicable	-
D1.9 – Travel by non-fire-isolated stairways or ramps	A non-fire-isolated stair must provide continuous means of travel from every storey to the level at which egress to a road or open space is provided and must not exceed 80m.	Complies	-
D1.10 - Discharge from exits	An exit must not be blocked at the point of discharge and where necessary, suitable barriers must be provided to prevent blocking the exit, or access to it.	Generally complies	




BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
D1.13 - Number of persons accommodated.	Provides a method of determining population of floors based upon deemed to satisfy occupancy rates per m ² relative to the use of the building or part.	Client to advise total workforce - less than 100 noted .	Adequate egress is available on both levels

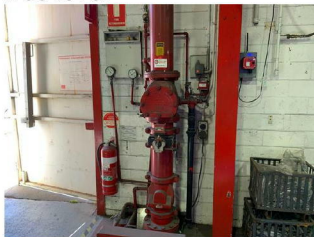
Part D2 - Construction of Exits

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
D2.7 - Installations in exits and paths of travel.	Electrical, gas meters & communications equipment is not permitted to be installed in fire stairs or paths to fire stairs or exits. Doors to electrical cupboards must be non-combustible and smoke sealed.	None noted	Nil works.
D2.8 Enclosure of space under stairs and ramps	The space below a required non fire-isolated stairway must not be enclosed to form a cupboard unless the enclosing walls and ceilings have an FRL of not less than 60/60/60 and is fitted with a self-closing -/60/30 fire door.	Cleaners room under the central L1 stair to first floor is not a -/60/30 FRL fire door.	Recommend install a -60/30 fire door to cleaners room
D2.13 - Goings and Risers.	Treads to stairs must not be less than 250mm. Risers must not exceed 190mm in height.	Generally comply, however 2 of 3 stairs to L1 have open risers contrary to AS1428.1.	Allow to remain for the purposes of fire safety.
D2.14 - Landings.	Required to all stairs and must be 750mm long and non slip.	Generally comply.	-
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. A 190mm step is permitted at a balcony or a doorway that opens to road or open space.	Does not comply to L1 storage room leading to L1 office 	Install a threshold landing 1m long and stairs with at least one handrail to both sides of doorway.



BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
			
D2.16 – Barriers to prevent falls	<p>Minimum height 1000mm measured from the finished floor covering as applicable.</p> <p>Openings are not to exceed 125mm (except in the case of wired balustrades which are to meet Table D2.16a).</p> <p>Where the drop exceeds 4m, there is to be no climbable elements between 150 & 760mm above finished floor covering.</p>	<p>Concession for Class 8 buildings noted.</p> <p>Balustrades to existing L1 stairs are 900mm high in lieu of 1m.</p>	Allow to remain as stairs are not new.
D2.17 - Handrails.	<p>All stair flights and ramps require handrails for safe passage. Where not required for disabled access a handrail located not less than 865mm above the line of nosing is required.</p> <p>Handrails in a required exit shall comply with AS1428.1.</p>	<p>Does not comply, the internal and external stairs have no extension and curl down terminations contrary to AS1428.1.</p>	Allow to remain as stairs are not new.
D2.18 - Fixed platforms, walkways, stairways and ladders.	<p>A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail or barrier attached thereto may comply with AS1657 in lieu of D2.13, D2.14, D2.16 and D2.17 if it only serves machinery rooms, boiler houses, lift-motor rooms, plant-rooms.</p>	Not assessed	-
D2.20 - Swinging doors.	<p>A swinging door in a required exit or forming part of a required exit must swing in the direction of egress unless it serves a building with a floor area not more than 200m².</p>	Generally complies	-
D2.21 - Operation of latch.	Doors to have free handles from the side	<p>Does not comply - the large gates to the Sprinkler</p>	<p>Install free egress levers to store rooms doors and SCV</p>


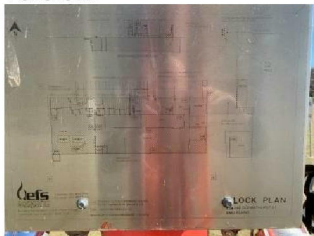


BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
	where exit is sought. Hardware to be located between 900mm and 1200mm above floor level; 900mm and 1100mm if door is accessible to people with disabilities.	<p>control valves do not a free lever</p>  <p>Some knobs noted on doors to storerooms in lieu of free levers</p>	egress gate.
D2.23 – Warning signs on doors	Warning signs required to fire stair doors and horizontal exit doors	Not required	-

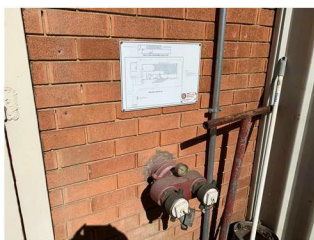

Part D3 - Access for People with a Disability – not assessed

Section E - Services and Equipment

Part E1 - Fire Fighting Equipment

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
E1.3 - Fire Hydrants.	A fire hydrant system must be provided to the building (greater than 500m ²) and be installed in accordance with AS 2419.1-2005.	<p>Coverage is generally compliant. Current hydrant system provided is to 1994 code in lieu of 2005 however not all the valves have storz fittings.</p>  <p>The current booster block plan is faded and should be replaced with new version.</p> 	Install Storz adapter fittings to valves.
E1.4 - Fire Hose Reels.	Where internal hydrants are provided or fire	Generally comply.	-



BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
	compartments exceed 500m ² fire hose reels must be provided.		
E1.5 - Sprinklers.	Required when a building has an effective height of 25m or more, in a carpark (other than an open deck carpark) if more than 40 vehicles are accommodated or if building deemed large isolated building.	<p>A sprinkler system is present however is an aged system with installation date not known.</p>  <p>There was no sprinkler head installed in the air lock between office and warehouse.</p> <p><i>There is no occupant warning system installed throughout.</i></p> <p><i>The sprinkler block plans at the sprinkler boosters are not compliant with AS 2118.1-1999 or 2017. There were no copies at each SCV.</i></p>	<p><i>It is recommended a new Fire Indicator Panel be installed at the main entry door linking the entire sprinkler system with the ASE and new occupant warning system installed throughout.</i></p>  <p><i>The entire system should be assessed by a suitably qualified sprinkler consultant and refurbished where necessary to operate effectively.</i></p> <p><i>New sprinkler block plans should be provided to current sprinkler code requirements.</i></p>
E1.6 - Portable fire extinguishers.	<p>Fire extinguishers must be provided to all locations which are deemed a potential risk to the occupants of the building, i.e. areas such as main switchboards</p> <p>Commercial kitchen require Class F extinguishers involving cooking oils and fats.</p>	Generally present	-
E1.8 - Fire control centres.	<p>A fire control centre facility in accordance with Specification E1.8 must be provided for:</p> <p>(b) a Class 6, 7, 8 or 9 building with a total floor area of more than 18,000m².</p>	Not required	-

Part E2 - Smoke Hazard Management

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
E2.2 - Smoke	A Class 8 building having	A sprinkler system is present	<i>Install a new occupant warning</i>



BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
Hazard Management.	<p>more than 2 storeys must be provided with –</p> <ul style="list-style-type: none"> • Automatic air pressurization system for fire-isolated exits in accordance with AS/NZS 1668.1-2005; or • A zone smoke control system in accordance with AS/NZS 1668.1-2015 if the building has more than one fire compartment; or • An automatic smoke detection and alarm system complying with Specification E2.2a & AS1670.1-2015; or • A sprinkler system complying with Specification E1.5. 	however an occupant warning system is not.	system linked to the sprinklers.

Part E4 – Visibility in an Emergency, Exit Signs and Warning Systems

BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
E4.2 – Emergency lights.	<p>Required in a building where the storey has:</p> <ul style="list-style-type: none"> • a floor area more than 300 m²; • in every required non-fire-isolated stairway; • if an exit from the unit does not open to a road or open space or to an external stairway, passageway, balcony or ramp, leading directly to a road or open space; 	Generally provided however not able to test.	Recommend obtain a full emergency lighting test report. Rectify where deficient
E4.5– Exit signs.	Required when in stairs & doors and visible to persons approaching the exit, and must be installed on, above or adjacent to each door providing direct egress from a storey.	Locations generally complies, however some exits signs were the worded EXIT type in lieu of running man.	<p>Rectify the non working exit signs.</p> <p>Replace faulty exit signs over time with new running man version.</p> <p>Exit signs required over the new doorways to L1 storage room.</p>
E4.6 - Direction signs.	Required to assist occupants in the direction to an exit.	Generally complies A directional exit sign in the polymer processing area G.29 was not operational	Rectify non working exit signs
E4.8 - Design and operation of exit signs.	To comply with AS 2293.1-2005.	Note.	-



BCA Clause	Requirement	Existing Building Non-Compliance	Recommendation and Strategy for upgrade
E4.9 – Sound system and intercom systems for emergency purposes.	A sound system and intercom system for emergency purposes complying where applicable with AS 1670.4 must be installed— (a) in a building with an effective height of more than 25 m (b) or in various class 3 & 9a buildings	The building is less than 25m effective height, so no intercom system required.	-