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BUILDING CODE OF AUSTRALIA 2016 REPORT

PROPOSED COSTCO DEPOT, OAKDALE SOUTH INDUSTRIAL ESTATE, KEMPS CREEK, NSW 2178

Report prepared for:	Costco Wholesale Australia Pty Limited 17-21 Parramatta Road Lidcombe NSW 2141 Attention: Timothy Hill - Director of Real Estate & Construction
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Document Acceptance

	Name	Signed	Date
Prepared by	Mark Maxwell		23/03/2017
Reviewed by	Rod Shepherd		23/03/2017

Revision History

Revision No.	Prepared by	Description	Date
R01	Mark Maxwell	Draft BCA Report for Review & Comment	24/02/2017
R02	Mark Maxwell	Updated BCA Report for Review & Comment	02/03/2017
R03	Mark Maxwell	BCA Report on DA Submission Plans	23/02/2017

1.0 Introduction

This report contains a design philosophy review concerning the capability of the design to meet Building Code of Australia 2016 (BCA) requirements. We have reviewed the architectural documentation (provided to date) for compliance with the deemed-to-satisfy provisions of the Building Code of Australia (BCA). This review has found that the fundamental design is capable of meeting the requirements of BCA. Where compliance with the deemed to satisfy provisions is not possible, performance solutions may be required.

We have made every attempt to cover the main issues under Parts B, C, D, E, F, G, H, and J of Volume 1 of the Building Code of Australia 2016. Areas of the design are still being refined so that resolution will be possible prior to the issue of a Construction Certificate for the works.

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Site Description
The proposed COSTCO depot is within the new Oakdale South Industrial Estate, located within Lot 12 in Deposited Plan 1178389 and Lot 87 in Deposited Plan 752041, Kemps Creek, Penrith local government area.

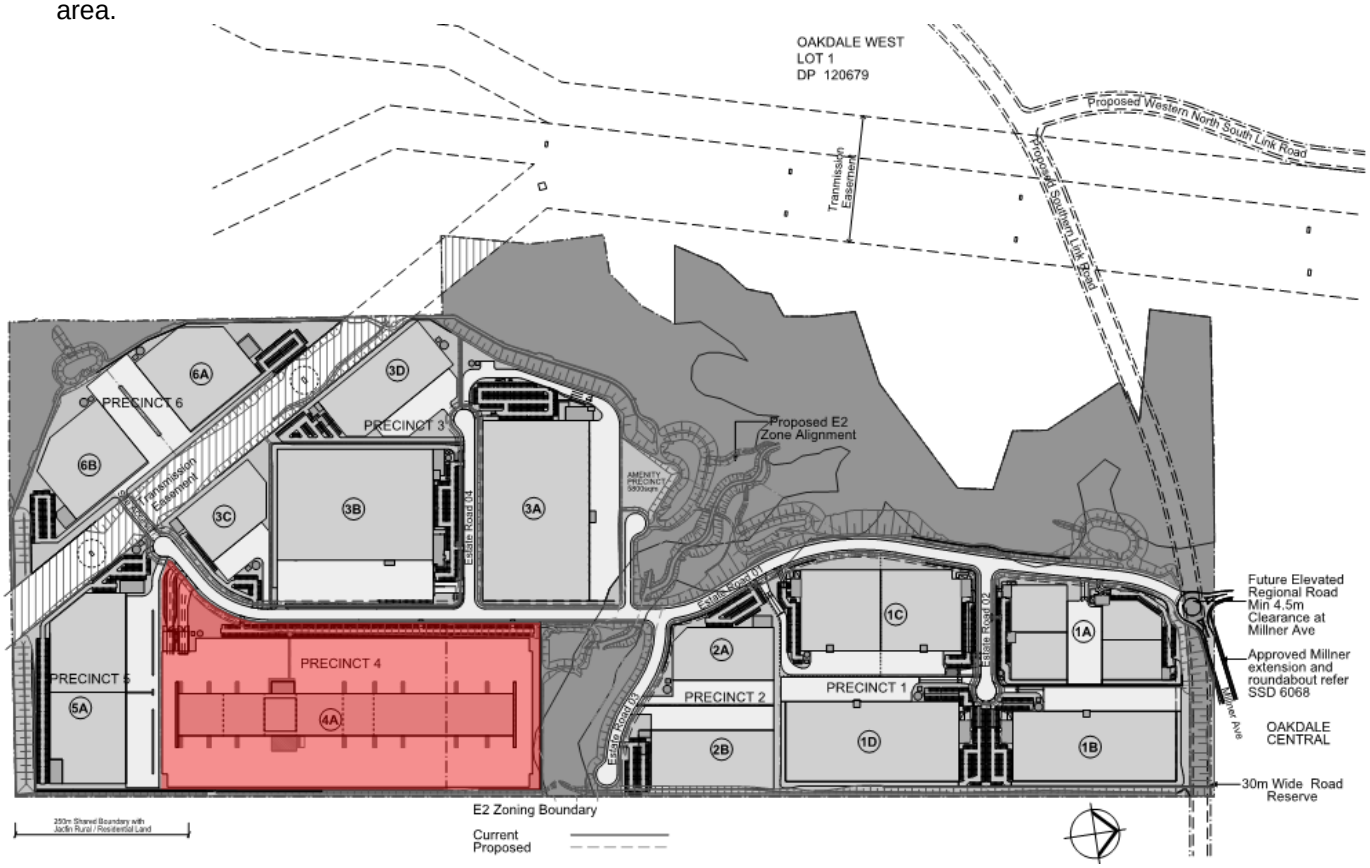


Figure 1: Oakdale South Industrial Estate - proposed Costco site shown in red

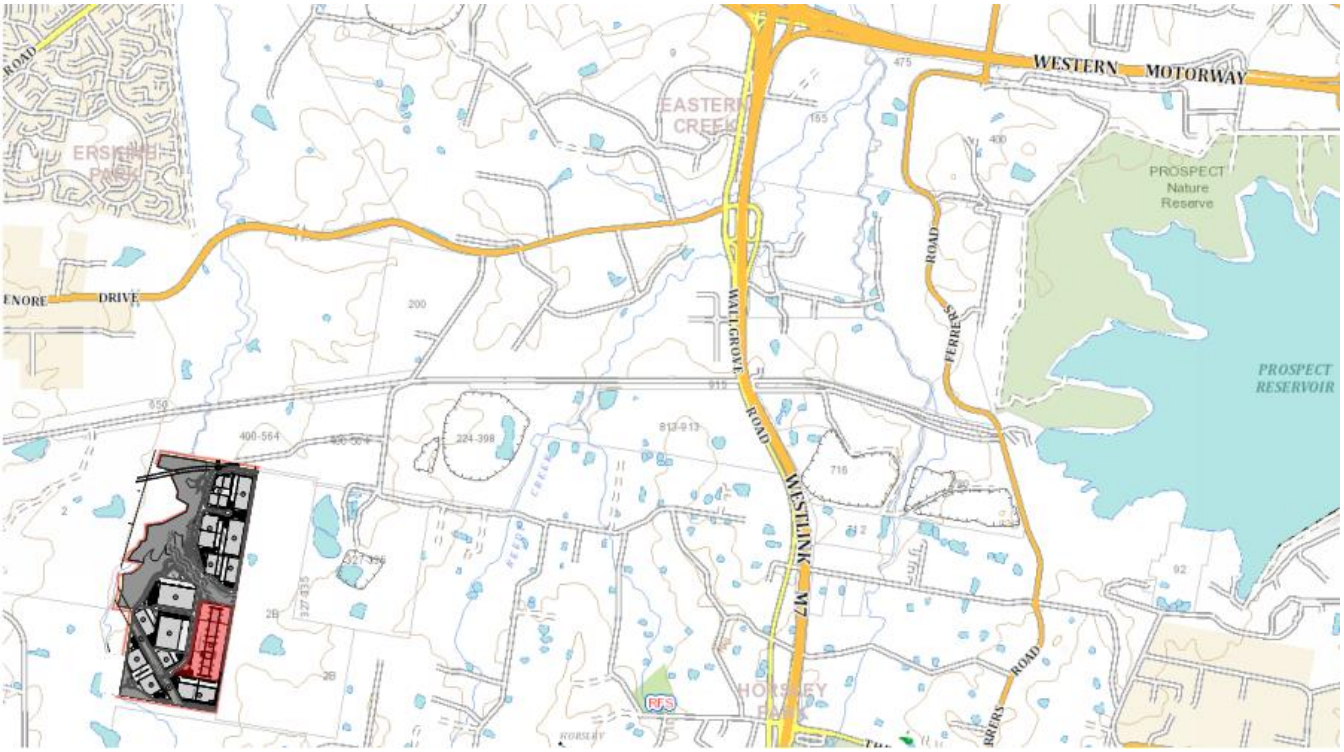


Figure 2: Oakdale South Industrial Estate location plan (source: https://maps.six.nsw.gov.au)

2.0 Brief

This report is the result of the review of the below listed architectural drawings as available at the time of assessment against the requirements of the Building Code of Australia 2016 (BCA), Volume.

The report overviews the design philosophy and provides information for the designers to incorporate into the design as well as identify areas that do not meet the BCA requirements and may require some revision, additional detail or performance solutions. Methodology is principally inspection of the available documentation.

Documentation available and assessed
The Development Application scheme assessed comprises of the following design drawings as per the attached drawing schedule as issued by Group GSA:

Drawing No.	Titled	Dated
DA0001 (C)	Title Sheet & Drawing List	24/03/17
DA1101.1 (C)	Site Plan Stage 1	24/03/17
DA1101 (E)	Site Plan	24/03/17
DA1102 (C)	Grid Setout	24/03/17
DA1103.1 (A)	Area Floor Plan Stage 1	24/03/17
DA1103 (C)	Area Floor Plan	24/03/17
DA2001 (C)	Overall Plan – Detail Callout Plan	24/03/17
DA2002 (C)	Roof Plan	24/03/17
DA2013 (B)	Ground Floor Plan – Zone D	24/03/17
DA3001 (C)	Concept Elevation	24/03/17
DA3002 (C)	Concept Elevation	24/03/17
DA3010 (C)	Concept Elevation Callout	24/03/17
DA3101 (B)	Overall Sections	24/03/17

3.0 Building Description and Assessment Criteria

3.1 Description

The building is proposed to be constructed within precinct 4 of the proposed Oakdale South Industrial Estate. The building will be used as a distribution depot and storage warehouse. The warehouse building has a ground floor area of approximately 23,523m² for stage 1 and an overall floor area of 33,588m². The 2 storey office component has a floor area of 1,689m². The building has a rise in storeys of 2 (due to the office component).

The building has an effective height measured under BCA of less than 25m. Car parking is all at grade and external to the building, a total of 238 parking spaces are being provided.

Under the Building Code of Australia (Clause C2.2) the building exceeds the maximum area & volume compartmentation limits for Type A construction for a Class 5, 7b and 8 building and therefore is deemed to be a large isolated building and assessed according to the requirements of Type C Construction.

The building falls under C2.3(b) (Large Isolated Building) which requires sprinkler protection and perimeter emergency vehicle access for NSW Fire Brigade meeting C2.4(b).

In addition, Table E2.2a (Large Isolated Buildings subject to C2.3) requires either smoke and heat vents OR Smoke Exhaust. System selection should be made in consultation with the Fire Safety Engineer.

As the rise in storey's is 2, on the basis of construction as a large isolated building, the building is assessed as Type C construction.

There is also a 72m² guards house located at the vehicular entrance of the site; this building is a Class 5 building of Type C construction.

3.2 Fire engineering review

Performance Solutions and Performance Based Assessment

Where compliance with the deemed to satisfy provisions is not readily achievable, performance based assessment and performance solutions will be used to demonstrate compliance with the BCA. This comes about due to the generic and prescriptive nature of the BCA with respect to the deemed to satisfy provisions and the inability for the document to be ultimately flexible for all building types and applications. This is the main reason the document allows performance solutions, where meeting the performance requirements, are deemed to also be compliant with the BCA.

Based on the current design drawings the following performance solutions are required (or anticipated) unless the drawings can be amended to comply with the deemed-to-satisfy requirements of the BCA.

No.	Issue	DtS Clause	Performance Requirement (A0.7)	Description
1.	Perimeter access to be greater than 18m from the building in some areas	C2.4(b)	CP9	Worst case shows the 6m vehicular access path being situated approx. 50m from the Southern facade of the Stage 1 development.
2.	Distance of travel greater than 40m to an exit	D1.4	DP4 and EP2.2	Warehouse – throughout the warehouse floor - up to 60m to an exit in lieu of 40m
3.	Distance between exits greater than 60m	D1.5(c)	DP4 and EP2.2	Warehouse floor up to 105m between exits in lieu of 60m
4.	A fire control centre must be located in a building that egress from any part of its floor, to a public road or open space, does not involve changes in level which in aggregate exceed 300mm	Spec E1.8	EP1.6	Location to be determined. Designers ensure compliance with Clauses 2-5 of Specification E1.8, otherwise performance solutions will be required.
5.	Smoke exhaust system which varies from the DTS provisions of the BCA.	E2.2	DP4 and EP2.2	Extent of non-compliances unknown at this point. Exhaust quantities, size of smoke zone, make up air requirements, smoke baffles and operational criteria's departing from the DtS provisions are to be specified by the FSE and forms part of CFD modelling. Furthermore, a performance solution will be required to delete these fire safety provisions from the office area.
6.	Height to exit signage to be greater than allowed by Australian Standards	E4.8(a)	EP4.2	Height of exit signs expected to exceed 2.7m per AS2293.1
7.	The external hydrants are located less than 10m from the building however are not safeguarded by 90/90/90 construction.	E1.3	EP1.3	The external hydrants are located less than 10m from the building however are not safeguarded by 90/90/90 construction.
8.	The booster is not deemed to be located at the boundary of the site.	E1.3	EP1.3	AS2419.1-2005 Clause 7.3(d)(i) requires the booster to be located at the boundary of the site and be within sight of the main entrance of the building. The proposed booster location is setback from the boundary, along the vehicular path way, by approximately 85m, this is not deemed to be located at the boundary of the site.

Clause 144 Fire and Rescue NSW Referral

Clause 144 of the Environmental Planning and Assessment Regulation 2000 requires referral of certain fire engineered solutions to Fire & Rescue NSW prior to issue of the Construction Certificate. Referral is required under the following circumstances;

a) A class 9a building that is proposed to have a total floor area of 2,000m²or more, or – ***N/A to the proposed development.***
b) A building (other than a class 9a building) that is proposed to have:
   (i) a fire compartment with a total floor area of more than 2,000m², or – ***applicable to proposed building***
   (ii) a total floor area of more than 6,000m² - ***applicable to proposed building***

Therefore referral to Fire and Rescue NSW will be required for this project where the plans and specifications for the erection, rebuilding, alteration, enlargement or extension provide for a performance solution to meet the performance requirements contained in any one or more of the Category 2 fire safety provisions. The current required performance solutions address Category 2 fire safety provisions, hence referral to FRNSW will be required.

4.0 Building Regulation Assessment

Building Code of Australia 2016 Classifications

According to the Building Code of Australia the following definitions assist in the classification of the buildings and their various parts.

Def - A3.1 Principles of classification
The classification of a building or part of a building is determined by the purpose for which it is designed, constructed or adapted to be used.

Def - A3.2 Classifications
The different parts of the building are classified as follows as they relate to the complex:

Class 5:
an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

Class 7:
a building which is—
(a) …….
(b) Class 7b — for storage, or display of goods or produce for sale by wholesale.

Class 8:
…. A building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

4.1 Part A – General Provisions

Class and use of the various levels of the building are as follows:-

Main Building

Level	Proposed Use	BCA Class
Ground	Warehouse, Offices, Plant, Workshop	Class 5, 7b, 8
Level 1	Office	Class 5

The rise in storey is 2, therefore requiring Type C construction, based on use only.

Guard House & Site Entry Gates

Level	Proposed Use	BCA Class
Ground	Office	Class 5

The rise in storey is 1, therefore requiring Type C construction.

4.2 Part B – Structure

The structural components of the building must comply with the applicable Australian Standards. Note: structural engineering components have not been assessed. Whilst the building is essentially constructed of steel and concrete any primary building element which is subject to attack by subterranean termites must be protected in accordance with Termite Risk Management specified in AS3660.1-2000 and Clause B1.4 (i) of the BCA. A primary building element is defined in the BCA as follows;

Primary building element means a member of a building designed specifically to take part of the loads specified in B1.2 and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of acting as a brace to those members.

The structural engineer will need to ensure the structural requirements of BCA Clause B1.1, B1.2, B1.4 is considered in the design stage.

4.3 Part C – Fire Resistance

C1 Fire Resistance and Stability

Clause		Comment	Compliance
C1.1	Type of construction required	The limitations of Type A construction are exceeded in terms of floor area (C2.2). The building must therefore be a large isolated building. In which case the rise in storey determines the type of construction under C1.1: **Main Building:** Rise in storeys of 2 = Type C Construction is required. **Guard House & Site Entry Gates** Rise in storeys of 1 = Type C Construction is required.	**Main Building:** Compliance readily achievable – structural engineer to note the requirements for Type C construction. **Guard House** Compliance readily achievable – structural engineer to note the requirements for Type C construction.
C1.2	Calculation of rise in storeys.	The rise in storeys 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— (a) above the finished ground next to that part; or (ii) if part of the external wall is on the boundary of the allotment, above the natural ground level at the relevant part of the boundary. In a Class 7 or 8 building, a storey that has an average internal height of more than 6 m is counted as— (a) one storey if it is the only storey above the ground; or (ii) 2 storeys in any other case.	**Main Building:** Rise in storeys of 2 (due to the 2 storey office component). **Guard House** Rise in storeys of 1 = Type C Construction is required.
C1.3	Buildings of multiple classification	In a building of multiple classifications, the Type of construction required for the building is the most fire-resisting Type resulting from the application of Table C1.1 on the basis that the classification applying to the top storey applies to all storey's.	Noted
C1.4	Mixed types of construction	A building may be of mixed Types of construction where it is separated in accordance with C2.7 and the Type of construction is determined in accordance with C1.1 or C1.3.	N/A to current design
C1.8	Lightweight construction	Lightweight construction used in walls or used to give steel columns or the like a required FRL must comply with Specification C1.8.	Where lightweight construction is proposed Spec C1.8 to be referenced on wall type drawings for Architectural Construction Certificate.

Clause		Comment	Compliance
C1.10	Fire hazard properties	The materials in the building are required to comply with the requirements of Clause C1.10, Specification C1.10 or for floor materials and coverings Note – Paint or fire-retardant coatings must not be used in order to make a material comply with a required fire hazard property.	Architectural Specification to specifically state “materials and linings are to meet C1.10 and Spec C1.10 of the BCA”. Builder to provide technical data sheets to show compliance prior to Occupancy Certification.
C1.11	Performance of External Walls in Fire	Concrete external walls that could collapse as complete panels (eg tilt-up and pre-cast concrete), in a building having a rise in storeys of not more than 2, must comply with Specification C1.11.	Structural engineer to note in design and include in design certification.
C1.12	Non-combustible materials	The following materials, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required: a) Plasterboard. b) Perforated gypsum lath with a normal paper finish. c) Fibrous-plaster sheet. d) Fibre-reinforced cement sheeting. e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0. f) Bonded laminated materials where— i. each laminate is non-combustible; and ii. each adhesive layer does not exceed 1 mm in thickness; and iii. the total thickness of the adhesive layers does not exceed 2 mm; and iv. the Spread-of-Flame Index and the Smoke-Developed Index of the laminated material as a whole does not exceed 0 and 3 respectively.	Note
C1.13	Fire-protected timber: Concession	Fire-protected timber in a Class 2, 3 or 5 building may be used wherever an element is required to be non-combustible, provided— a) the building is— i. a separate building; or ii. a part of a building— A. which only occupies part of a storey, and is separated from the remaining part by a fire wall; or B. which is located above or below a part not containing fire-protected timber and the floor between the adjoining parts is provided with an FRL not less than that prescribed for a fire wall for the lower storey; and b) the building has an effective height of not more than 25 m; and c) the building has a sprinkler system throughout complying with Specification E1.5; and d) any insulation installed in the cavity of the timber building element required to have an FRL is non-combustible; and e) cavity barriers are provided in accordance with Specification C1.13.	At this stage it is assumed the design will not incorporate fire-protected timber members

C2 Compartmentation and Separation

Clause		Comment	Compliance
C2.2	General floor area and volume limitations	Type C limits – Class 6, 7, 8, 9a parts not to exceed 2,000m^2 and volume 12,000m^3 Class 5, 9b part not to exceed 3,000m^2 and volume 18,000m^3 Type B limits – Class 6, 7, 8, 9a parts not to exceed 3,500m^2 and volume 21,000m^3 Class 5, 9b part not to exceed 5,500m^2 and volume 33,000m^3 Type A limits – Class 6, 7, 8, 9a parts not to exceed 5,000m^2 and volume 30,000m^3 Class 5, 9b part not to exceed 8,000m^2 and volume 48,000m^3	**Main Building:** Exceeds the allowable areas and volumes, even for type A construction. Building will be assessed as a large isolated building and is therefore permitted to be Type C construction due to the Rise in Storeys. **Guard House** Will comply with the floor area / volume requirements for Type C Construction
C2.3	Large Isolated buildings	The building is Class 5, 6, 7, 8 or 9 and exceeds 18,000 m^2 in floor area or 108,000 m^3 in volume, if it is— 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)	**Main Building:** The building is to be provided with a sprinkler system throughout compliant with AS2118.1- 1999 Certification from the design engineer will need to be provided to the accredited certifier prior to issue of the Construction Certificate. The relevant design certificate must also make reference to requirements of any Fire Engineered solution report by Defire. **Guard House** N/A
C2.4	Requirements for open spaces and vehicular access	Vehicular access required by this Part— i. must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and ii. must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and iii. must provide reasonable pedestrian access from the vehicular access to the building; and iv. must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and v. must be wholly within the allotment except that a public road complying with (i), (ii), (iii) and (iv) may serve as the vehicular access or part thereof.	**Main Building:** i. Compliance readily achievable ii. Compliance not achievable based on the apparent design of the loading docks, the plant area, and the location of the future stage 2 development – Defire to include as part of the fire engineering – worst case shows the 6m vehicular access path being situated approx. 50m from the Southern facade of the Stage 1 development. i. Compliance readily achievable ii. Compliance readily achievable – Structural engineers input required iii. Will comply

Clause		Comment	Compliance
			Guard House N/A
C2.6	Vertical separation of openings in external walls	Applies only to building of Type A construction	N/A to buildings of Type C Construction
C2.7	Separation by fire walls	Fire walls are to have the FRL's specified by the BCA. Fire walls are to be constructed in accord with tested systems and penetrations are to be fire sealed / collared / dampered to meet the BCA accepted specifications or tested systems. Building elements other than timber roof battens of maximum 75 x 50mm cross section are not permitted to pass through a fire wall unless the required fire resistance of the wall will not be reduced.	**Main Building:** Compliance is required where fire walls are required or provided – refer to BCA C2.12 and C2.13 for further information in regards to the provision of fire walls **Guard House** N/A
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— a) each building element in that storey must have the higher FRL prescribed in Specification C1.1 for that element for the classifications concerned; or b) the parts must be separated in that storey by a fire wall having— i. the higher FRL prescribed in Table 3 or 4; or ii. the FRL prescribed in Table 5, of Specification C1.1 as applicable, for that element for the Type of construction and the classifications concerned	**Main Building:** Type C Construction applies throughout **Guard House** Type C Construction applies throughout
C2.9	Separation of classifications in different storeys	If parts of different classification are situated one above the other in adjoining storeys they must be separated as follows; - Type B or C construction — If one of the adjoining parts is of Class 2, 3 or 4, the floor separating the part from the storey below must— (i) be a floor/ceiling system incorporating a ceiling which has a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; or (ii) have an FRL of at least 30/30/30; or (iii) have a fire-protective covering on the underside of the floor, including beams incorporated in it, if the floor is combustible or of metal.	N/A to the proposed design

Clause	Comment	Compliance
C2.10 Separation of lift shafts	Any lift connecting more than 2 storeys, or more than 3 storeys if the building is sprinklered, (other than lifts which are wholly within an atrium) must be separated from the remainder of the building by enclosure in a shaft in which— (i) in a building required to be of Type A construction—the walls have the relevant FRL prescribed by Specification C1.1; and (ii) in a building required to be of Type B construction — the walls— (A) if loadbearing, have the relevant FRL prescribed by Table 4 of Specification C1.1; or (B) if non-loadbearing, be of non-combustible construction.	**Main Building:** N/A to the proposed design **Guard House & Site Entry Gates** N/A
C2.12 Separation of equipment.	Essential / emergency equipment including lift motor rooms, emergency generators, central smoke control plant, boilers or batteries are to be separated by 2 hour fire rated construction.	**Main Building:** Services / Electrical design engineers to confirm the location of any essential equipment in the building and ensure that all emergency equipment operating in emergency mode is located within a fire rated main electrical room – compliance readily achievable. Relevant design engineers to confirm the location of any emergency generators, boilers or batteries (batteries exceeding 24V and 10 ampere hours). **Guard House & Site Entry Gates** N/A
C2.13 Electrical supply system	An electricity substation located within a building must— (i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and (ii) have any doorway in that construction protected with a self-closing fire door having an FRL of not less than –/120/30. A main switchboard located within the building which sustains emergency equipment operating in the emergency mode must— (i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and (ii) have any doorway in that construction protected with a self-closing fire door having an FRL of not less than –/120/30.	The proposed substation is located remote from the building on the street frontage. Electrical design engineers to provide details of the equipment located within.

C3 Protection of Openings

Clause		Comment	Compliance
C3.2	Protection of openings in external walls	Openings in an external wall that is required to have an FRL must— (a) if the distance between the opening and the fire-source feature to which it is exposed is less than— (i) 3 m from a side or rear boundary of the allotment; or (ii) 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or (iii) 6 m from another building on the allotment that is not Class 10, be protected in accordance with C3.4 and if wall-wetting sprinklers are used, they are located externally	Nil found to require protection
C3.3	Separation of external walls and associated openings in different fire compartments	The distance between parts of external walls and any openings within them in different fire compartments separated by a fire wall must not be less than that set out in Table C3.3, unless— (a) those parts of each wall have an FRL not less than 60/60/60; and (b) any openings protected in accordance with C3.4.	**Main Building:** If the office component is fire separated from the warehouse (in the event Costco want to reduce the risk of losing both office and warehouse to fire) to comply with BCA C2.8 the requirements of this Clause will apply. **Guard House & Site Entry Gates** N/A
C3.4	Acceptable methods of protection	Where protection is required, doorways, windows and other openings must be protected as follows: (i) Doorways— (A) internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or (B) –/60/30 fire doors that are self-closing or automatic closing. (ii) Windows— (A) internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or (B) –/60/– fire windows that are automatic closing or permanently fixed in the closed position; or (C) –/60/– automatic closing fire shutters. (iii) Other openings— (A) excluding voids — internal or external wall-wetting sprinklers, as appropriate; or (B) construction having an FRL not less than –/60/–. Fire doors, fire windows and fire shutters must comply with Specification C3.4.	Note

Clause		Comment	Compliance
C3.5	Doorways in fire walls	The aggregate width of openings for doorways in a fire wall, which are not part of a horizontal exit, must not exceed ½ of the length of the fire wall, and each doorway must be protected by a single fire door or fire shutter which has an FRL of not less than that required by Specification C1.1 for the fire wall except that each door or shutter must have an insulation level of at least 30. A fire door or fire shutter must be self-closing, or automatic closing. The automatic closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located on each side of the fire wall not more than 1.5 m horizontal distance from the opening.	**Main Building:** Note compliance where fire walls required **Guard House & Site Entry Gates** N/A
C3.15	Openings for service installations	Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an external wall or roof) that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire, that installation must comply with any one of the following: a) Tested systems b) Ventilation and air-conditioning — In the case of ventilating or air-conditioning ducts or equipment, the installation is in accordance with AS/NZS1668.1. c) Compliance with BCA Specification C3.15	**Main Building:** Compliance required for services passing through any fire rated elements. **Guard House & Site Entry Gates** N/A
C3.17	Columns protected with lightweight construction to achieve an FRL	A column protected by lightweight construction to achieve an FRL which passes through a building element that is required to have an FRL or a resistance to the incipient spread of fire, must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the required FRL or resistance to the incipient spread of fire.	**Main Building:** Compliance required for services passing through any fire rated elements **Guard House & Site Entry Gates** N/A

Specification C1.1 - Fire-Resisting Construction

Clause	Comment	Compliance
5. TYPE C FIRE-RESISTING CONSTRUCTION		
5.1 Fire-resistance of building elements	In a building required to be of Type C construction a building element listed in Table 5 and any beam or column incorporated in it, must have an FRL not less than that listed in the Table for the particular Class of building concerned	**Main Building:** Nil fire ratings required for the proposed warehouse. Refer to Appendix A for the specific fire ratings for Type C Construction. **Guard House** Nil fire ratings required for the proposed guard house. Refer to Appendix A for the specific fire ratings for Type C Construction.

4.4 Part D – Access and Egress

D1 Provision for Escape

Clause		Comment	Compliance
D1.2	Number of exits required	All buildings — Every building must have at least one exit from each storey. Access to exits — Without passing through another sole-occupancy unit every occupant of a storey or part of a storey must have access to— (i) an exit; or (ii) at least 2 exits, if 2 or more exits are required.	**Main Building:** Complies **Guard House** Complies
D1.3	When fire-isolated stairways and ramps are required	Class 5, 6, 7, 8 or 9 buildings — Every stairway or ramp serving as a required exit must be fire-isolated unless it connects, passes through or passes by not more than 2 consecutive storeys and one extra storey of any classification may be included if the building has a sprinkler system complying with Specification E1.5 installed throughout	**Main Building:** Stairs are not required to be fire isolated as they connect no more than 2 storeys and the building is to be fitted with a sprinkler system **Guard House** N/A
D1.4	Exit travel distances.	Class 5 to 9 (i) no point on a floor must be more than 20 m from an exit, or a point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits must not exceed 40 m; and (ii) in a Class 5 or 6 building, the distance to a single exit serving a storey at the level of access to a road or open space may be increased to 30 m.	**Main Building:** The travel distances will require fire engineering; the approximate distances are as follows (distances to be finalised as the design progresses); • Warehouse: a) Distance to nearest exit – 70m from within the freezer **Guard House** Compliance with DtS provisions appears achievable
D1.5	Distance between alternative exits	Exits that are required as alternative means of egress must be— a) distributed as uniformly as practicable within or around the storey served and in positions where unobstructed access to at least 2 exits is readily available from all points on the floor including lift lobby areas; and b) not less than 9 m apart; and c) not more than 60 m apart; and d) located so that alternative paths of travel do not converge such that they become less than 6 m apart.	**Main Building:** The travels distances will require fire engineering; the approximate distances are as follows (distances to be finalised as the design progresses); • Warehouse: a) Distance between exits likely up to 105m **Guard House** Compliance with DtS provisions appears achievable
D1.6	Dimensions of exits.	Aggregate egress to cater for the number of occupants to the floor. Paths of exit are to be no less in clear width than 1.0m and no less than 2.0m clear height. Width of exit not to diminish in the direction of travel. 1m wide	**Main Building:** The client will need to confirm the expected maximum population.

Clause		Comment	Compliance
		egress path should be maintained throughout. If the *storey* or *mezzanine* accommodates more than 200 persons, the aggregate unobstructed width, except for doorways, must be increased to - 2 m plus 500 mm for every 60 persons (or part) in excess of 200 persons if egress involves a change in floor level by a stairway or ramp with a gradient steeper than 1 in 12; or in any other case, 2 m plus 500 mm for every 75 persons (or part) in excess of 200; and	The fire safety engineer would be expected to assess egress with queuing as part of the fire safety assessment for the building. Note the minimum clear door width for egress is 750mm and 1980mm in height. The number and aggregate width of exits provided is expected to comply. **Guard House** Compliance with DtS provisions appears achievable
D1.9	Travel by non-fire-isolated stairways or ramps	A non-fire-isolated stairway or non-fire-isolated ramp serving as a required exit must provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to a road or open space is provided. In a Class 5, 6, 7, 8 or 9 building, the distance from any point on a floor to a point of egress to a road or open space by way of a required non-fire-isolated stairway or non-fire-isolated ramp must not exceed 80 m. In a Class 5 to 8 or 9b building, a required non-fire-isolated stairway or non-fire-isolated ramp must discharge at a point not more than— (i) 20 m from a doorway providing egress to a road or open space or from a fire-isolated passageway leading to a road or open space; or (ii) 40 m from one of 2 such doorways or passageways if travel to each of them from the non-fire-isolated stairway or non-fire-isolated ramp is in opposite or approximately opposite directions.	Current design 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 vehicles from blocking the exit, or access to it. If a required exit leads to an open space, the path of travel to the road must have an unobstructed width throughout of not less than— (i) the minimum width of the required exit; or (ii) 1 m, whichever is the greater. If an exit discharges to open space that is at a different level than the public road to which it is connected, the path of travel to the road must be by— (i) a ramp or other incline having a gradient not steeper than 1:8 at any part, or not steeper than 1:14 if required by the Deemed-to-Satisfy Provisions of Part D3	**Main Building:** Architect to consider the use of kerbs or bollards are to be provided at exit point interface with carparks and loading bays etc. All other provisions of this Clause currently comply. **Guard House** Compliance with DtS provisions appears achievable

Clause		Comment	Compliance
		The discharge point of alternative exits must be located as far apart as practical.	
D1.13	Number of persons accommodated	The number of persons accommodated in a storey, room or mezzanine must be determined with consideration to the purpose for which it is used and the layout of the floor area.	**Main Building:** There are a number of factors that limits populations in buildings including sanitary facilities, fresh air supply and aggregate egress width. In this case the client is expected nominated an expected maximum population. **Guard House** Please confirm the expected population, however expected to be minimal
D1.16	Plant rooms and lift motor rooms, Concession	Plant rooms less than 100m^2 can be served by a ladder only, if less than 200m^2 can be served by a stair first and then a ladder, and over 200m^2 need two stairs.	Compliance readily achievable

D2 Construction of Exits

Clause		Comment	Compliance
D2.3	Non-fire-isolated stairways and ramps	In a building having a rise in storeys of more than 2, required stairs and ramps (including landings and any supporting building elements) which are not required to be within a fire-resisting shaft, must be constructed according to D2.2, or only of— a) reinforced or prestressed concrete; or b) steel in no part less than 6 mm thick; or c) timber that— (i) has a finished thickness of not less than 44 mm; and (ii) has an average density of not less than 800 kg/m^3 at a moisture content of 12%; and (iii) has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.	**Main Building:** N/A as the building has a rise in storeys of 2 **Guard House** N/A
D2.7	Installations in exits and paths of travel	EDB, Electricity meters, central telecommunication DB's and electric motors must not be installed in the corridor leading to the required exit unless it is enclosed in non-combustible construction and door fitted with smoke seals.	EDB's to have a non-combustible lining and smoke seals to the door – Architect to note
D2.8	Enclosure of space under stairs	Non fire-isolated stairways and ramps – The space below a required non fire-isolated stairway (including an external stairway) or non fire-isolated ramp must not be enclosed to form a cupboard or other enclosed space unless - (i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and (ii) any access doorway to the enclosed space is fitted with a self-closing –/60/30 fire door.	Architect to note
D2.10	Pedestrian ramps	A ramp serving as a required exit must— (i) where the ramp is also serving as an accessible ramp under Part D3, be in accordance with AS1428.1; or (ii) in any other case, have a gradient not steeper than 1:8. The floor surface of a ramp must have a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586.	Compliance readily achievable – plans to show compliance prior to issue of CC

Clause	Comment	Compliance
D2.13 Treads and risers	Goings (G) are to be between 250mm and maximum 355mm; and Risers (R) to be between 115mm and maximum 190mm; and The quantity (2R+G) is to be between 550 and 700 constant goings and risers throughout each flight, are considered constant if the variation between— a) adjacent risers, or between adjacent goings, is no greater than 5 mm; and b) the largest and smallest riser within a flight, or the largest and smallest going within a flight, does not exceed 10 mm; and Risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads; and Treads which have— a) a surface with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; or b) a nosing strip with a slip-resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586	Compliance readily achievable – plans to show compliance prior to issue of CC
D2.14 Landings	Required to all stairs with dimensions to comply.	Compliance readily achievable – plans to show compliance prior to issue of CC
D2.15 Thresholds	Threshold of a doorway must not incorporate a step or ramp closer than the width of the doorway. In a building required to be accessible by Part D3, the doorway— (i) opens to a road or open space; and (ii) is provided with a threshold ramp or step ramp in accordance with AS 1428.1 Threshold permitted in doorway opening to open space, external balcony provided the sill is <190mm.	Compliance readily achievable – plans to show compliance prior to issue of CC.
D2.16 Balustrades or barriers	The height is not less than - (A) 1 m above the floor of any access path, balcony, landing or the like where the path of travel has a gradient less than 1:20; or (B) 865 mm above the floor of a landing to a stair or ramp where the balustrade or other barrier is provided along the inside edge of the landing and does not exceed a length of 500 mm; or (C) 865 mm above the floor beneath an openable window. Class 7 / 8 Areas – A 300mm sphere must not be able to pass through any opening; or where rails are used a 150 mm sphere must not be able to pass	Compliance readily achievable – plans to show compliance prior to issue of CC

Clause		Comment	Compliance
		through the opening between the nosing line of the stair treads and the rail or between the rail and the floor of the landing, balcony or the like; and the opening between rails must not be more than 460mm. Class 5 Areas (and any class 7/8 areas external to the building) - Any opening does not permit a 125 mm sphere to pass through it and for stairs, the space is measured above the nosings – applicable to the balustrade adjacent the loading docks. Barrier climbability – Class 5 areas - For floors more than 4 m above the surface beneath, Any horizontal or near horizontal elements between 150 mm and 760 mm above the floor must not facilitate climbing.	
D2.17	Handrails	Fixed at a height of not less than 865 mm measured above the nosings of stair treads and the floor surface of the ramp, landing, or the like. In a required exit serving an area required to be accessible, designed and constructed to comply with clause 12 of AS 1428.1-2009 Handrails required to assist people with a disability must be provided in accordance with D3.3.	Compliance readily achievable – plans to show compliance prior to issue of CC
D2.18	Fixed platforms, walkways, stairways, and ladders	Handrail, balustrade to ladders and platforms must comply with AS 1657 in plant rooms, machinery rooms. This includes inclusion of a toe-board complying with Clause 3.4.3 of AS1657 which shall be provided at the edge of a platform, walkway, or landing, which is greater than 10 mm distant from a permanent structure and where an object could fall more than 2000 mm.	Compliance readily achievable – plans to show compliance prior to issue of CC
D2.19	Doorways and doors	Exits must not be fitted with revolving and other special door types in certain circumstances. If automatic sliding door is fitted, it must fail safe open and must be openable under a force of not greater than 110N	Compliance readily achievable – plans / specifications to show compliance prior to issue of CC
D2.20	Swinging doors.	Required exits doors are to swing in the direction of travel. Doors in the path of travel may swing either way. Doors must not obstruct exit routes.	Will comply
D2.21	Operation of latch	Doors to have free handles from the side where exit is sought. Hardware to be located between 900mm and 1100mm above the finished floor level.	Compliance readily achievable – plans to show compliance prior to issue of CC Doors in paths of travel to exits that are locked for security reasons are to failsafe open on fire alarm.

Clause		Comment	Compliance
D2.23	Signs on doors	Fire or smoke doors to be fitted with appropriate signage on the door leaves; (i) for an automatic door held open by an automatic hold-open device— “ FIRE SAFETY DOOR—DO NOT OBSTRUCT ”; or (ii) for a self-closing door— “ FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN ”	**Main Building:** N/A to current design **Guard House** N/A
D2.24	Protection of openable windows	A barrier with a height not less than 865 mm above the floor is required to an openable window where the floor below the window is 4 m or more above the surface beneath if the window. Such a barrier must not permit a 125mm sphere to pass through it; and must not have any horizontal or near horizontal elements between 150mm and 760mm above the floor that facilitate climbing	**Main Building:** Insufficient details at this stage in the design – architects to ensure design complies - Compliance readily achievable – plans / specifications to show compliance prior to issue of CC **Guard House** N/A

D3 Access for People with a Disability

Clause		Comment	Compliance
D3.1	General building access requirements	Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4. Class 5, 7b and 8 - To and within all areas normally used by the occupants.	Access is required to and within all areas of the proposed buildings. An access consultant may be appointed to provide a Performance Solution to justify the lack of access into certain areas of the buildings based on the use of the area.
D3.2	Access to Buildings	An accessway must be provided to a building required to be accessible— (i) from the main points of a pedestrian entry at the allotment boundary; and (ii) from another accessible building connected by a pedestrian link; and (iii) from any required accessible carparking space on the allotment.	Ensure the design of the pedestrian entry at the allotment boundary is in accordance with the accessibility requirements of AS1428.1-2009 i.e. ramps etc. Architect to show the accessible parking spaces and the accessible path of travel from these spaces to both the guard house and the main warehouse/office building. Compliance readily achievable – plans / specifications to show compliance prior to issue of CC

Clause		Comment	Compliance
D3.3	Parts of buildings to be accessible	Every ramp and stairway, except for ramps and stairways in areas exempted by D3.4, must comply with— (i) for a ramp, Clause 10 of AS 1428.1; and (ii) for a stairway, Clause 11 of AS 1428.1; and Every passenger lift must comply with E3.6 All doors in accessible areas shall have a clear width of not less than 850mm, and shall comply with the door circulation requirements of AS1428.1-2009	Compliance readily achievable – plans / specifications to show compliance prior to issue of CC
D3.4	Exemptions	The following areas are not required to be accessible: 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 a disability. c) Any path of travel providing access only to an area exempted by (a) or (b).	Where Costco wish to consider certain areas of the development exempt from the access requirements of the BCA, please provide a letter outlining the works / services undertaken in the area and the reasons for invoking the exemptions of BCA D3.4.
D3.5	Accessible carparking	In a Class 5, 7 or 8 buildings, accessible parking must be provided at a rate of 1 space for every 100 carparking spaces or part thereof. Parking spaces to comply with AS/NZS 2890.6	The total parking spaces for the development is proposed to be 236 spaces, hence a minimum of 3 accessible car parking spaces are required (note the requirements for the shared space under AS2890.6) – current design complies showing 6 accessible parking spaces.
D3.6	Signage	Braille and tactile signage complying with Specification D3.6 must incorporate the international symbol of access or deafness, as appropriate, in accordance with AS1428.1 and identify each— a) sanitary facility, except a sanitary facility within a sole-occupancy unit in a Class 1b or Class 3 building; and b) space with a hearing augmentation system Braille and tactile signage complying with Specification D3.6 must identify each door required by E4.5 to be provided with an exit sign and state— (A) " **Exit** "; and (B) " **Level** " ; and either (aa) the floor level number; or (bb) a floor level descriptor; or (cc) a combination of (aa) and (bb) Signage in accordance with AS 1428.1 must be provided for accessible unisex sanitary facilities to identify if the facility is suitable for left or right handed use; and signage to identify an ambulant accessible sanitary facility in accordance with AS 1428.1 must be located on the door of the facility	Architect to note the signage requirements; signage schedule to be provided for assessment prior to issue of CC.

Clause		Comment	Compliance
D3.8	Tactile indicators (TGSI's)	For a building required to be accessible, tactile ground surface indicators must be provided to warn people who are blind or have a vision impairment that they are approaching— (i) a stairway, other than a fire-isolated stairway; and (ii) an escalator; and (iii) a passenger conveyor or moving walk; and (iv) a ramp other than a fire-isolated ramp, step ramp, kerb ramp or swimming pool ramp; and (v) in the absence of a suitable barrier— (a) an overhead obstruction less than 2 m above floor level, other than a doorway; and (b) an accessway meeting a vehicular way adjacent to any pedestrian entrance to a building, excluding a pedestrian entrance serving an area referred to in D3.4, if there is no kerb or kerb ramp at that point, except for areas exempted by D3.4. Required tactile ground surface indicators must comply with sections 1 and 2 of AS/NZS 1428.4.1.	Architect to note - Compliance readily achievable – plans / specifications to show compliance prior to issue of CC
D3.11	Ramps	On an accessway— a) a series of connected ramps must not have a combined vertical rise of more than 3.6 m; and b) a landing for a step ramp must not overlap a landing for another step ramp or ramp. *Accessway* means a continuous accessible path of travel (as defined in AS 1428.1) to, into or within a building.	Architect to note the maximum rise of a series of ramps.
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.	The proposed glazing decals / motifs are to be shown on the architectural plans prior to issue of CC

4.5 Part E – Services and Equipment

E1 Fire Fighting Equipment

Clause	Comment	Compliance
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 If external fire hydrants are proposed, they must be located more than 10m from the external wall of the building, otherwise, a fire rated wall will be required to shield the fire in accordance with clause 3.2.2.2 of AS2419.1-2005 i.e. 90/90/90 and extending 2 m each side of the fire hydrant outlet; and extending not less than 3 m above the ground adjacent to the fire hydrant or the height of the building, whichever is the lesser. External Hydrants - All areas of the building requiring hydrant protection shall be served by 10m of water spray from the end of a 60m hose length. Note, a minimum of 1 m of hose shall extend into any room served Fire Hydrant Booster and Pump Room is to be designed in accordance with AS2419.1-2005, further details required for assessment prior to issue of CC	**Main Building:** Hydrant coverage is required to be provided to all areas of the building. Details of the proposed system to be provided for assessment when available. The external hydrants are located less than 10m from the building however are not safeguarded by 90/90/90 construction – Fire engineer to include as a performance solution. AS2419.1-2005 Clause 7.3(d)(i) requires the booster to be located at the boundary of the site and be within sight of the main entrance of the building. The proposed booster location is setback from the boundary, along the vehicular path way, by approximately 85m, this is not deemed to be located at the boundary of the site – Fire engineer to include as a performance solution. The proposed location of the pump room appears to comply with AS2419.1-2005 **Guard House** N/A
E1.4 Fire Hose-Reels	Hose reels should be arranged to provide for full coverage to these portions building in accordance with AS 2441-2005. All points on a floor shall be within reach of a 4 m hose stream issuing from a nozzle at the end of the hose laid on floor. The hose length shall not exceed 36m. Note - Fire hose reels must be located so that the fire hose will not need to pass through doorways fitted with fire or smoke doors In achieving system coverage, one or a combination of the following criteria for individual internally located fire hose reels must be met in determining the layout of any fire hose reel system: (i) Fire hose reels must be located adjacent to an internal fire hydrant (other than one within a fire-isolated exit), except that a fire hose reel need not be located adjacent to every fire hydrant, provided system coverage can be	**Main Building:** Fire hose reel coverage is required to be provided to all areas of the building. Details of the proposed system to be provided for assessment when available. **Guard House** N/A

Clause		Comment	Compliance
		achieved. (ii) Fire hose reels must be located within 4 m of an exit, except that a fire hose reel need not be located adjacent to every exit, provided system coverage can be achieved. (iii) Where system coverage is not achieved by compliance with (i) and (ii), additional fire hose reels may be located in paths of travel to an exit to achieve the required coverage.	
E1.5	Sprinklers	A sprinkler system must— a) be installed in a building or part of a building when required by Table E1.5; and b) comply with Specification E1.5.	**Main Building:** A sprinkler system complying with Spec E1.5 and AS2118.1-1999 is required to be provided to all areas of the building. Details of the proposed system to be provided for assessment when available. **Guard House** N/A
E1.6	Portable Fire Extinguishers	Required in accordance with Table E1.6 of the BCA and selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444. **General provisions**—Class 2 to 9 buildings: 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 including that held in fuel tanks of vehicles). d) To cover Class A fire risks in normally occupied fire compartments less than 500 m2 not provided with fire hose reels (excluding open deck carparks). Notes 1. For the purposes of this Table, an emergency services switchboard is one which sustains emergency equipment operating in the emergency mode.	**Main Building:** Compliance required - Plans to show compliance prior to issue of CC **Guard House & Site Entry Gates** Compliance required - Plans to show compliance prior to issue of CC
E1.8	Fire Control Centre	A fire control **centre** facility in accordance with Specification E1.8 must be provided for— (a) a building with an effective height of more than 25 m; and (b) a Class 6, 7, 8 or 9 building with a total floor area of more than 18 000 m^2.	**Main Building:** Fire Control Centre is required – Meeting Clauses 2-5 of Specification E1.8 (see clauses below). Plans to show compliance prior to issue of CC – suggest this is shown on the plans prior to submission of DA. Note that a “centre” is not required to be a dedicated room. **Guard House** N/A

Specification E1.5 – Fire Sprinkler Systems

Clause		Comment	Compliance
Spec E1.5	Fire Sprinkler Systems	Subject to this Specification, a sprinkler system must comply with— (a) AS 2118.1; or (b) for a combined sprinkler and fire hydrant system: AS 2118.6; Specification E1.5 items of note for designers reference – Fast response sprinklers may be installed only if they are suitable for the type of application proposed and it is demonstrated that the sprinkler system is designed to accommodate their use. Sprinkler Valves - Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space; and all sprinkler valve rooms and enclosures must be secured with a system suitable for use by the fire brigade. The Grade of water supply to a required sprinkler system must not be less than, for a building not greater than 25 m in effective height, at least Grade 3. A required sprinkler system must be connected to and activate a building occupant warning system complying with Clause 6 of Specification E2.2a. Where a smoke hazard management system is installed and is actuated by smoke detectors, the sprinkler system must, wherever practicable, be arranged to also activate the smoke hazard management system.	**Main Building:** A sprinkler system complying with Spec E1.5 and AS2118.1-1999 is required to be provided to all areas of the building. Details of the proposed system to be provided for assessment when available. **Guard House** N/A

Specification E1.8 – Fire Control Centres

Clause		Comment	Compliance
2	Purpose and Content	A fire control centre must— a) provide an area from which fire-fighting operations or other emergency procedures can be directed or controlled; and b) contain controls, panels, telephones, furniture, equipment and the like associated with the required fire services in the building; and c) not be used for any purpose other than the control of— (i) fire-fighting activities; and (ii) other measures concerning the occupant safety or security.	Compliance required - Plans to show compliance prior to issue of CC
3	Location of fire control centre	A fire control centre must be so located in a building that egress from any part of its floor, to a road or open space, does not involve changes in level which in aggregate exceed 300 mm.	Compliance required - Plans to show compliance prior to issue of CC. Please advise asap if compliance cannot be achieved so Defire can include as part of the fire engineering performance solution.

Clause		Comment	Compliance
4	Equipment not permitted within a fire control centre	An internal combustion engine, pumps, sprinkler control valves, pipes and pipe fittings must not be located in a fire control centre, but may be located in rooms accessed through the fire control centre.	Compliance required - Plans to show compliance prior to issue of CC
5	Ambient sound level for a fire control centre	(a) The ambient sound level within the fire control centre measured when all fire safety equipment is operating in the manner in which it operates in an emergency must not exceed 65 dB(A). (b) The measurement must be taken for a sufficient time to characterize the effects of all sound sources. Where there is not a great variation in noise level, a measurement time of 60 seconds may be used.	Note

E2 Smoke Hazard Management

Clause		Comment	Compliance
E2.2	General Requirements	An air-handling system which does not form part of a smoke hazard management system in accordance with Table E2.2a or Table E2.2b and which recycles air from one fire compartment to another fire compartment or operates in a manner that may unduly contribute to the spread of smoke from one fire compartment to another fire compartment must— (i) be designed and installed to operate as a smoke control system in accordance with AS/NZS 1668.1; or (ii) (A) incorporate smoke dampers where the air-handling ducts penetrate any elements separating the fire compartments served; and (B) be arranged such that the air-handling system is shut down and the smoke dampers are activated to close automatically by smoke detectors complying with clause 7.5 of AS 1670.1 Miscellaneous air-handling systems covered by Sections 5 and 6 of AS/NZS1668.1 serving more than one fire compartment (other than a carpark ventilation system) and not forming part of a smoke hazard management system must comply with that Section of the Standard.	**Main Building:** Designers to note **Guard House** N/A

Clause		Comment	Compliance
Table E2.2a	General Provisions	**CLASS 5, 6, 7b, 8 and 9b BUILDINGS** In a building having a rise in storeys of more than 2 and containing— (i) a Class 5 part; and (ii) a Class 7b, 8 the building must be provided with— a) a zone smoke control system in accordance with AS/NZS 1668.1, if the building has more than one fire compartment; or b) an automatic smoke detection and alarm system complying with Specification E2.2a; or c) A sprinkler system complying with Specification E1.5. **LARGE ISOLATED BUILDINGS SUBJECT TO C2.3** In a Class 5, 6, 7, 8 or 9 building, which exceeds 18,000m^2 in floor area or 108,000m^3 in volume, the building must be provided with— (i) if the ceiling height of the fire compartment is not more than 12 m— (A) an automatic smoke exhaust system in accordance with Specification E2.2b; or (B) (B) automatic smoke-and-heat vents in accordance with Specification E2.2c	**Main Building:** A sprinkler system complying with Spec E1.5 is to be provided throughout to satisfy the large isolated building provisions – Will comply We understand that a smoke exhaust system in accordance with Specification E2.2b will be provided. Note, a performance solution will be required to delete these fire safety provisions from the office area. It is likely that the system will vary from the DTS provisions of the BCA; Defire to review and provided comments / performance solution. **Guard House** N/A

SPECIFICATION E2.2a SMOKE DETECTION AND ALARM SYSTEMS

Clause		Comment	Compliance
2	Type of System	Smoke exhaust fans must have a sufficient capacity to contain the smoke layer— (i) within a smoke reservoir formed in accordance with Clause 4 and not less than 2 m above the highest floor level; and (ii) above the top of any openings interconnecting different smoke reservoirs. Exhaust rates must be determined in accordance with Figure 2, with the height measurement taken from the lowest floor level to the underside of the smoke layer.	**Main Building:** Applies to active the smoke hazard management systems of Spec E2.2b; Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A
5	Smoke detection for smoke control systems	Smoke detectors required to activate— (i) automatic shutdown of air-handling systems in accordance with Table E2.2b; or (ii) a smoke exhaust system in accordance with Specification E2.2b, must— (iii) be spaced— (A) not more than 20 m apart and not more than 10 m from any wall, bulkhead or smoke curtain; and (B) in enclosed malls and walkways in a Class 6 building not more than 15 m apart and not more than 7.5 m from any wall, bulkhead or curtain;	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. Details of the proposed system to be provided for assessment when available. **Guard House** N/A

Clause		Comment	Compliance
		and (iv) have a sensitivity— (A) in accordance with AS1670.1 in areas other than a multi-storey walkway and mall in a Class 6 building; and (B) not exceeding 0.5% smoke obscuration per metre with compensation for external airborne contamination as necessary, in a multi-storey walkway and mall in a Class 6 building. Smoke detectors provided to activate a smoke control system must— (i) (A) form part of a building fire or smoke detection system complying with AS 1670.1; or (B) be a separate dedicated system incorporating control and indicating equipment complying with AS 1670.1; and (ii) activate a building occupant warning system complying with Clause 6, except that smoke detectors provided solely to initiate automatic shutdown of air-handling systems in accordance with (b)(i) need not activate a building occupant warning system.	
6	Building occupant warning system	A building occupant warning system provided as part of a smoke hazard management system must comply with clause 3.22 of AS1670.1 to sound through all occupied areas	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. Details of the proposed system to be provided for assessment when available. **Guard House** N/A
7	System monitoring	The following installations must be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS1670.3: Smoke detection in accordance with Clause 5 provided to activate— (i) a smoke exhaust system in accordance with Specification E2.2b; or (ii) smoke-and-heat vents in accordance with Specification E2.2c.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. Details of the proposed system to be provided for assessment when available. **Guard House** N/A

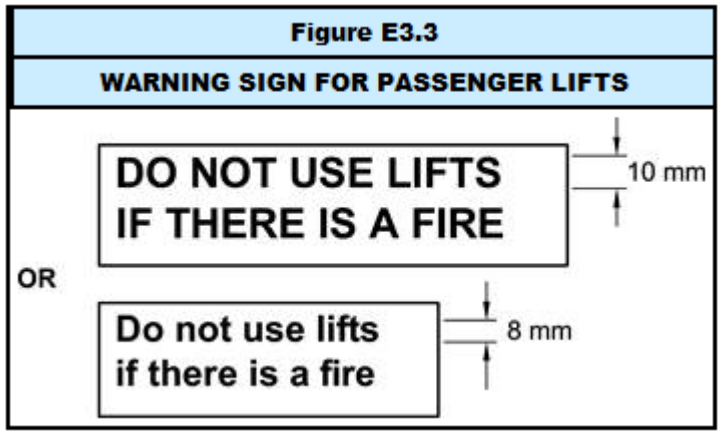
SPECIFICATION E2.2b SMOKE EXHAUST SYSTEMS

Clause		Comment	Compliance
2	Smoke exhaust capacity	Smoke exhaust fans must have a sufficient capacity to contain the smoke layer— (i) within a smoke reservoir formed in accordance with Clause 4 and not less than 2 m above the highest floor level; and (ii) above the top of any openings interconnecting different smoke reservoirs. Exhaust rates must be determined in accordance with Figure 2, with the height measurement taken from the lowest floor level to the underside of the smoke layer.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A
3	Smoke exhaust fans	Each smoke exhaust fan, complete with its drive, flexible connections, control gear and wiring must— a) be constructed and installed so that it is capable of continuous operation (exhausting the required volumetric flow rate at the installed system resistance) at a temperature of 200° C for a period of not less than 1 hour; and ~~b) in a building not fitted with a sprinkler system, be capable of continuous operation at a temperature of 300° C for a period of not less than 30 minutes; and~~ c) be rated to handle the required volumetric flow rate at ambient temperature to be capable of exhausting cool smoke during the early stages of a fire and to allow routine testing; and d) have any high temperature overload devices installed, automatically overridden during the smoke exhaust operation.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A
4	Smoke reservoirs	a) A fire compartment must be divided at ceiling level into smoke reservoirs formed by smoke baffles/curtains of non-combustible and non-shatterable construction. b) The horizontal area of a smoke reservoir must not exceed 2000 m^2 ~~and in enclosed walkways and malls of a Class 6 building must not exceed 60 m in length.~~ c) Smoke reservoirs must be of sufficient depth to contain the smoke layer and must not be less than 500 mm below an imperforate ceiling or roof. d) (i) Within a multi-storey fire compartment, a non-combustible bulkhead or smoke baffle/curtain must be provided around the underside of each opening into a building void to minimise the spread of smoke to other storeys. (ii) The depth of the bulkhead or smoke baffle must be not less than the depth of the smoke reservoir provided under (c) plus an additional 400mm.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A

Clause		Comment	Compliance
5	Smoke exhaust fan and vent location	Smoke exhaust fans and vents must be located— a) such that each smoke reservoir is served by one or more fans with the maximum exhaust rate at any one point limited to avoid extracting air from below the smoke layer; and b) to prevent the formation of stagnant regions resulting in excessive cooling and downward mixing of smoke; and c) at natural collection points for the hot smoky gases within each smoke reservoir having due regard to the ceiling geometry and its effect on the migratory path of the smoke; and d) away from the intersection of walkways or malls; and e) to ensure that any voids containing escalators and/or stairs commonly used by the public are not used as a smoke exhaust path; and f) to discharge directly to outdoor with a velocity of not less than 5 m/s, at a suitable point not less than 6 m from any air intake point or exit.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. . **Guard House** N/A
6	Make-up air	a) Low level make-up air must be provided either automatically or via permanent ventilation openings to replace the air exhausted so as to minimise— (i) any disturbance of the smoke layer due to turbulence created by the incoming air; and (ii) the risk of smoke migration to areas remote from the fire due to the effect of make-up air on the air balance of the total system. b) The velocity of make-up air through doorways must not exceed 2.5 m/s. c) Within a multi-storey fire compartment, make-up air must be provided across each vertical opening from a building void to the fire-affected storey at an average velocity of 1 m/s so as to minimise the spread of smoke from the fire-affected storey to other storeys.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A
7	Smoke exhaust system control	a. Each smoke exhaust fan must be activated sequentially by smoke detectors complying with Specification E2.2a and arranged in zones to match the smoke reservoir served by the fan(s). b. Subject to (c) and (d), an air handling system (other than individual room units less than 1000 L/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS/NZS 1668.1) which does not form part of the smoke hazard management system must be automatically shut down on the activation of the smoke exhaust system. c. In a single storey fire compartment, air handling systems in all non-fire-affected zones may operate on 100% outdoor air to provide make-up air to the fire-affected zone. d. Within a multi-storey fire compartment, air handling systems in all non-fire-	**Main Building:** Refer to comments under Spec E2.2a above. Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A

Clause	Comment	Compliance
	affected zones and storeys must operate at 100% outdoor air to provide make-up air to the fire-affected storey via building voids connecting storeys. e. Manual override control and indication together with operating instructions for use by emergency personnel must be provided adjacent to the fire indicator panel in accordance with the requirements of clauses 4.11 and 4.13 of AS/NZS 1668.1. f. Manual control for the smoke exhaust system must also be provided at a location normally used by the stage manager in a theatre. g. Power supply wiring to exhaust fans together with detection, control, and indication circuits (and where necessary to automatic make-up air supply arrangements) must comply with AS/NZS 1668.1.	
8 Smoke detection	A smoke detection system must be installed in accordance with Specification E2.2a to activate the smoke exhaust system.	**Main Building:** Designers to note; Defire to provide input on the design of the system. Any variations from the DtS provisions will require input and a performance solution from Defire. **Guard House** N/A

E3 Lift Installations

Clause		Comment	Compliance
E3.1	Lift installations	An electric passenger lift installation and an electrohydraulic passenger lift installation must comply with Specification E3.1.	**Main Building:** Designers to note. Lift details required prior to issue of CC **Guard House** N/A
E3.3	Warning against use of lifts in fire	A warning sign must— (a) be displayed where it can be readily seen— (i) near every call button for a passenger lift or group of lifts throughout a building; except (ii) a small lift such as a dumb-waiter or the like that is for the transport of goods only; and (b) comply with the details and dimensions of Figure E3.3 and consist of— (i) incised, inlaid or embossed letters on a metal, wood, plastic or similar plate securely and permanently attached to the wall; or (ii) letters incised or inlaid directly into the surface of the material forming the wall. **Figure E3.3** **WARNING SIGN FOR PASSENGER LIFTS**  	**Main Building:** Designers to note. Signage schedule to reflect compliance prior to issue of CC **Guard House** N/A
E3.5	Landings	Access and egress to and from liftwell landings must comply with the Deemed-to-Satisfy Provisions of Section D.	**Main Building:** Designers to note. Details required prior to issue of CC **Guard House** N/A

Clause		Comment	Compliance
E3.6	Passenger lifts	In an accessible building, every passenger lift must— (a) be one of the types identified in Table E3.6a, subject to the limitations on use specified in the Table; and (b) have accessible features in accordance with Table E3.6b	**Main Building:** Designers to note. Lift details required prior to issue of CC **Guard House** N/A

E4 Emergency Lighting, Exit Signs and Warning Systems

Clause		Comment	Compliance
E4.2	Emergency lighting requirements	Required in every storey of a Class 5, 6, 7, 8 or 9 building where the storey has a floor area more than 300m^2. In every required non-fire-isolated stairway In every required fire control centre.	**Main Building:** Emergency lighting required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available. **Guard House** N/A
E4.4	Design and operation of emergency lighting	Every required emergency lighting system must comply with AS 2293.1.	**Main Building:** Emergency lighting required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available **Guard House** N/A
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— a) door providing direct egress from a storey to— (i) an enclosed stairway, passageway or ramp serving as a required exit; and (ii) an external stairway, passageway or ramp serving as a required exit; and (iii) an external access balcony leading to a required exit; and b) door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space; and c) horizontal exit; and d) door serving as, or forming part of, a required exit in a storey required to be provided with emergency lighting in accordance with E4.2.	**Main Building:** Exit signage required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available. **Guard House** Exit signage required over all exit doors opening to the external access balcony. Electrical services designer to note. Details of the proposed system to be provided for assessment when available.

Clause	Comment	Compliance
E4.6 Direction signs	If an exit is not readily apparent to persons occupying or visiting the building, then exit signs must be installed— (a) in appropriate positions in corridors, hallways, lobbies, foyers, auditoria, and the like, indicating the direction to a required exit;	**Main Building:** Compliance required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available. **Guard House & Site Entry Gates** Compliance required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available
E4.8 Design and operation of exit signs	Every required exit sign must comply with— (a) AS 2293.1; or (b) for a photoluminescent exit sign, Specification E4.8; and be clearly visible at all times when the building is occupied by any person having the right of legal entry to the building.	**Main Building:** Compliance required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available. Height of exit signs expected to exceed 2.7m per AS2293.1-2005, hence this will be included as a performance solution in Defire's Fire Engineering Report. **Guard House & Site Entry Gates** Compliance required throughout the building; electrical services designer to note. Details of the proposed system to be provided for assessment when available

4.5 Part F – Heath and Amenity

F1 Damp and Weatherproofing

Clause		Comment	Compliance
F1.1	Stormwater drainage	Stormwater drainage must comply with AS/NZS 3500.3.	Hydraulic / civil engineer to note; details and design certification to be provided prior to issue of CC
F1.4	External above ground membranes	Waterproofing membranes for external above ground use must comply with AS 4654 Parts 1 and 2.	Architectural specification to note compliance
F1.5	Roof coverings	A roof must be covered with— a) concrete roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050, as appropriate; or b) terracotta roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050; or c) cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or d) metal sheet roofing complying with AS 1562.1; or e) plastic sheet roofing designed and installed in accordance with AS/NZS 4256 Parts 1, 2, 3 and 5 and AS/NZS 1562.3; or f) asphalt shingles complying with ASTM D3018-90, Class A.	Architectural specification to note compliance as appropriate
F1.6	Sarking	Sarking-type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.	Architectural specification to note compliance
F1.7	Waterproofing of wet areas in buildings	In a Class 5, 7, 8 building, building elements in the bathroom or shower room, a slop hopper or sink compartment, a laundry or sanitary compartment must— (i) be water resistant or waterproof in accordance with Table F1.7; and (ii) comply with AS 3740, as if they were in a Class 2 or 3 building or a Class 4 part of a building.	Architectural specification to note compliance
F1.9	Damp-proofing	a) Except for a building covered by (c), moisture from the ground must be prevented from reaching— (i) the lowest floor timbers and the walls above the lowest floor joists; and (ii) the walls above the damp-proof course; and (iii) the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders. b) Where a damp-proof course is provided, it must consist of— (i) a material that complies with AS/NZS 2904; or (ii) impervious sheet material in accordance with AS 3660.1. c) The following buildings need not comply with (a): (i) A Class 7 or 8 building where in the particular case there is no necessity for compliance.	Architectural specification to note compliance

Clause		Comment	Compliance
F1.10	Damp-proofing of floors on the ground	If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870, except damp-proofing need not be provided if— a) weatherproofing is not required; or b) the floor is the base of a stair, lift or similar shaft which is adequately drained by gravitation or mechanical means.	Architectural specification to note compliance
F1.13	Glazed assemblies	The following glazed assemblies in an external wall, must comply with AS 2047 requirements for resistance to water penetration: (i) Windows. (ii) Sliding and swinging glazed doors with a frame, including french and bi-fold doors with a frame. (iii) Adjustable louvres. (iv) Shopfronts. (v) Window walls with one piece framing.	Architectural specification to note compliance

F2 Sanitary and Other Facilities

Clause		Comment	Compliance
F2.2	Calculation of number of occupants and fixtures.	a) The number of persons accommodated must be calculated according to D1.13 if it cannot be more accurately determined by other means. b) Unless the premises are used predominantly by one sex, sanitary facilities must be provided on the basis of equal numbers of males and females. c) In calculating the number of sanitary facilities to be provided under F2.1 and F2.3, a unisex facility required for people with a disability may be counted once for each sex. d) For the purposes of this Part, a unisex facility comprises one closet pan, one washbasin and means for the disposal of sanitary towels.	Note
F2.3	Facilities in Class 3 to 9 buildings	The numbers of facilities can be calculated depending on how many people are occupying the building.	In this case the client is expected nominated an expected maximum population

Clause		Comment	Compliance
F2.4	Facilities for people with disabilities.	Class 5, 6, 7, 8 or 9 - 1 accessible sanitary facility on every storey containing sanitary compartments (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). the circulation spaces, fixtures and fittings of all accessible sanitary facility must comply with the requirements of AS1428.1-2009. At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS1428.1-2009 must be provided for use by males and females.	Sanitary facilities for disabled persons have to be provided to the building and to comply with AS1428.1 – Will be required on each level of the office area.
F2.6	Interpretation: Urinals and washbasins	A urinal may be— (i) an individual stall or wall-hung urinal; or (ii) each 600 mm length of a continuous urinal trough; or (iii) a closet pan used in place of a urinal. A washbasin may be— (i) an individual basin; or (ii) a part of a hand washing trough served by a single water tap.	Architect to note

F3 Room Heights

Clause		Comment	Compliance
F3.1	Height of rooms and other spaces.	In a Class 5, 6, 7 or 8 building— (i) except as allowed in (ii) and (f) — 2.4 m; and (ii) a corridor, passageway, or the like — 2.1 m; and (f) in any building— (i) a bathroom, shower room, sanitary compartment, airlock, tea preparation room, pantry, store room, garage, car parking area, or the like — 2.1 m; and (ii) a commercial kitchen — 2.4 m; and (iii) above a stairway, ramp, landing or the like — 2 m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.	Architect to note; plans to reflect compliance prior to issue of CC

F4 Light and Ventilation

Clause		Comment	Compliance
F4.4	Artificial lighting	(a) Artificial lighting must be provided— (i) in required stairways, passageways, and ramps; and (ii) if natural light of a standard equivalent to that required by F4.2 is not available, and the periods of occupation or use of the room or space will create undue hazard to occupants seeking egress in an emergency, in a Class 5, 7, 8 buildings, to all rooms that are frequently occupied, all spaces required to be accessible, all corridors, lobbies, internal stairways, other circulation spaces and paths of egress. (b) The artificial lighting system must comply with AS/NZS 1680.0.	Compliance readily achievable Electrical engineer to certify design compliance.
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— (a) natural ventilation complying with F4.6; or (b) a mechanical ventilation or air-conditioning system complying with AS1668.2.	Compliance readily achievable Mechanical engineer to certify design compliance.
F4.9	Airlocks	Sanitary facilities are to be mechanically exhausted or provided with an airlock.	Compliance readily achievable Mechanical engineer to certify design compliance.

G1 Minor Structures and Components

Clause		Comment	Compliance
G1.2	Refrigerated chambers, strong-rooms and vaults	A refrigerated or cooling chamber, strongroom or vault which is of sufficient size for a person to enter must have— (i) a door which is capable of being opened by hand from inside without a key; and (ii) internal lighting controlled only by a switch which is located adjacent to the entrance doorway inside the chamber, strongroom or vault; and (iii) an indicator lamp positioned outside the chamber, strongroom or vault which is illuminated when the interior lights required by (a)(ii) are switched on; and (iv) an alarm that is— a. located outside but controllable only from within the chamber, strongroom or vault; and b. able to achieve a sound pressure level outside the chamber, strongroom or vault of 90 dB(A) when measured 3 m from the sounding device. A door required by (i) in a refrigerated or cooling chamber must have a doorway with a clear width of not less than 600 mm and a clear height not less than 1.5 m.	Compliance readily achievable; plans and specifications to show compliance prior to issue of CC

NSW G1.01 Provision for Cleaning Windows

Clause	Comment	Compliance
NSW G1.01 Provision for Cleaning Windows	a) A building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level. b) A building satisfies (a) where— (i) the windows can be cleaned wholly from within the building; or (ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.	N/A to current 2 storey design

4.8 Part J – Energy Efficiency

J1 –J8 Building Fabric, external glazing, air movement & hot water supply etc.

Clause	Comment	Compliance
Part J Compliance with BCA the provisions	In NSW, Class 3 and 5 to 9 buildings must comply with all of the provisions of the National Section J that are applicable to the relevant classifications. Performance Requirements JP1 and JP3 are satisfied by complying with— a) for reducing the heating or cooling loads— ~~(i) of sole-occupancy units of a Class 2 building or a Class 4 part of a building, J0.2 and J0.3; and~~ (ii) of a Class 2 to 9 building, other than the sole-occupancy units of a Class 2 building or a Class 4 part of a building, Parts J1, J2 and J3; and b) for air-conditioning and ventilation, Part J5; and c) for artificial lighting and power, Part J6; and d) for heated water supply and swimming pool and spa pool plant, Part J7; and e) for facilities for monitoring, Part J8.	Provide a copy of the Part J report confirming design compliance to the authority having jurisdiction. The architectural drawings must note compliance with J0, J1, J2 and J3, details required prior to issue of CC The services drawings particularly the electrical, hydraulic and mechanical drawings must include compliance with Parts J5, J6, J7 and J8 of BCA. Design certification is to be provided prior to prior to issue of a Construction Certificate.

Appendix A - Table 5 Type C Construction: FRL of Building Elements

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	–/–/–	–/–/–	–/–/–	–/–/–