



BLACKETT
MAGUIRE+
GOLDSMITH

BCA ASSESSMENT REPORT

LORETO NORMANHURST STAGE 1



January 2019

Ref: 180226

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| 11/01/2019 | 2 | Terminology changes | BM | TH |

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A. INTRODUCTION

A.1 STATE SIGNIFICANT DEVELOPMENT APPLICATION (CONCEPT MASTERPLAN AND DETAILED STAGE 1 WORKS)

INTRODUCTION

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This application is SSD by way of clause 8 and schedule 1 under *State Environmental Planning Policy (State and Regional Development) 2011* on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than \$20 million.

Specifically, this application relates to a staged SSDA within the meaning of Section 4.12 of the EP&A Act, with this application being the Concept Proposal for a new site wide masterplan for the existing Loreto Normanhurst School at 91 – 93 Pennant Hills Road, Normanhurst. In addition, consent is also sought for the Stage 1 detailed design works for a new on campus student boarding facility, landscaping works, and some demolition works to the buildings between Mary Ward and existing dining room building and associated works to make good existing.

This report has been prepared having regard to the Secretary's Environmental Assessment Requirements issued for the project by DPE, ref no SEAR 8996 issued on 12 January 2018.

BACKGROUND

Need for a Campus Masterplan

Loreto Normanhurst is an independent, Catholic day and boarding school for girls from Years 5 to 12. The existing school campus was established in 1897 and has evolved in an organic and ad-hoc manner across the span of a 120 years.

A new campus wide planning approach offers the opportunity to strategically review and plan for the campus' future in a sustainable and efficient manner such that the campus' unique aesthetic and ecological values are best preserved. The preparation of a campus wide masterplan is also consistent with the School's 'Loreto Normanhurst 2016 - 2020 Strategic Plan' which identified the need for a broader strategic plan to coordinate renewal and orderly development in a feasible and staged manner.

Early Learning Centre

A separate DA (D/1227/2018) has been submitted to Hornsby Shire Council on 23 November 2018 for an 80 place Early Learning Centre (ELC) building and the DA is currently under assessment. The ELC building is consistent with the overall concept masterplan, and was prepared concurrently with the final preferred campus masterplan. However, to meet the School's operational timeframe requirements for the ELC, a separate application was seen to be best pathway to allow the building to be built, fitout and operational by 2021.

THE SITE

Loreto Normanhurst is located within the suburb of Normanhurst on Sydney's Upper North Shore approximately 3km south of Hornsby and 25km north of Sydney CBD. The school is located in the local government area of Hornsby Shire Council, approximately 750m south of the Normanhurst Railway Station. The locational context of the site is illustrated at **Figure 1**.

The site comprises the existing campus grounds of the Loreto Normanhurst school at 91 – 93 Pennant Hills Road, Normanhurst. The northern part of the site accommodates much of the school's existing built form, while the rear extent consists of the school's sporting fields, and a portion of largely undeveloped land covered in remnant vegetation.

The campus itself is bound by Pennant Hills Road (to the north), Osborn Road (to the west) and Mount Pleasant Avenue (to the east). Detached dwellings on individual residential lots about the southern boundary of the site. An aerial photograph of the site is provided at **Figure 2** below.

Figure 2 provides an aerial map of the site and its immediate surrounds.

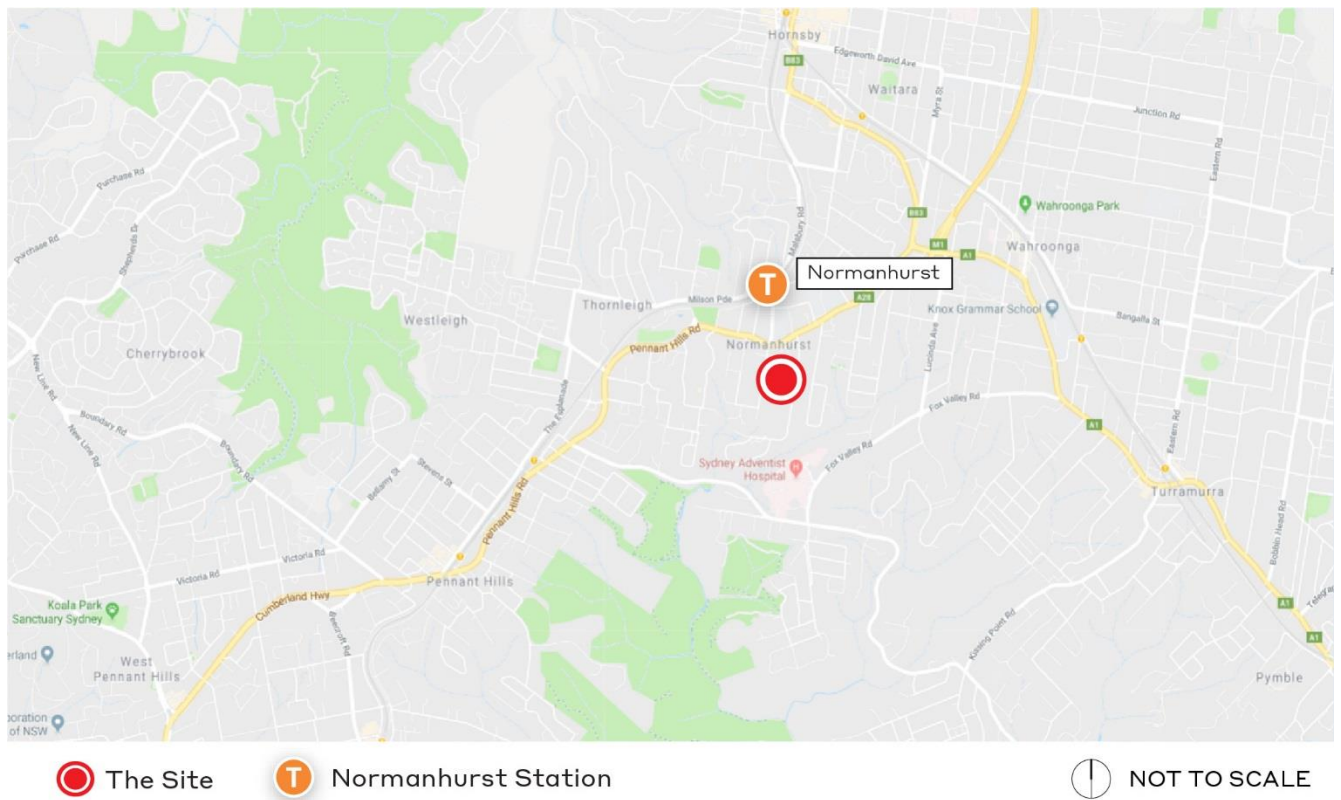


Figure 1 – Loreto Normanhurst Campus Location Context Plan
Source: Ethos Urban



Figure 2 – Aerial Map of the Loreto Normanhurst Campus
Source: AJ+C Architects



LEGAL DESCRIPTION AND OWNERSHIP

The campus comprises several allotments, the legal descriptions of which are provided in **Table 1** below. The existing campus has a site area of approximately 13.02ha. The site in its entirety is owned by the Trustees of the Loreto Property Association.

Table 1 Legal Description

| Address | Lot | Plan |
|-------------------------------|--------------------------|------------|
| 16 Mount Pleasant Avenue | Lot 5 | DP 1218765 |
| | Lot 16 | DP 6612 |
| 30 – 62 Mount Pleasant Avenue | Lots 20 – 23 and 25 – 36 | DP 6612 |
| | Lot 1 | DP 34834 |
| 91 – 93 Pennant Hills Road | Lot 1 | DP 114580 |
| | Lot 3 | DP 1217496 |
| | Lot 1 – Lot 3 | DP 1218765 |
| | Lot B | DP327538 |
| 24 – 28 Mount Pleasant Avenue | Lot 1 | DP 809066 |
| 6 Mount Pleasant Avenue | Lot C | DP 366271 |
| 14 Mount Pleasant Avenue | Lot 4 | DP1218765 |
| 89 Pennant Hills Road | Lot 1 | DP136156 |

OVERVIEW OF PROPOSED DEVELOPMENT

This application sets out a new campus masterplan for the existing school campus that will guide and shape the development of the school campus for the next 30 years. This SSDA also includes detailed plans for the first stage of the concept proposal (Stage 1 works). Accordingly, consent is sought for the following:

- The concept masterplan, including:
 - Establishment of 10 new building envelopes across the site for education and ancillary uses including student accommodation;
 - Increase of the student number cap by 850 students from 1150 to 2000 students;
 - The open space and landscape design;
 - Pedestrian and circulation arrangements, and
 - Associated car parking provision.
- Detailed consent for Stage 1 works, being:
 - Construction of a new 3 to 6-storey boarding house to accommodate up to 216 boarders.
 - Excavation works to accommodate partially underground carpark and dock facilities within the proposed footprint of the new boarding house facility;
 - Demolition works to buildings between Mary Ward and existing dining room building and associated works to make good existing;
 - Landscaping works and removal and replacement of approximately 50 trees of varying significance; and
 - Augmentation of connection of services and utilities infrastructure.



BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been engaged by Loreto Normanhurst to undertake a Building Code of Australia (BCA) assessment for the proposed boarding house. The development is proposed to contain the following:

- + Demolition of 2 single storey houses fronting Mount Pleasant Ave
- + Construction of a new multi-level Boarding House comprising:
 - o *Basement 2 – Carpark and Back of House areas*
 - o *Basement 1 – Carpark, Laundry, sanitary facilities, plant areas, Gymnasium.*
 - o *Level 1 – Dining hall, Kitchen, sanitary facilities, Loading Dock, residential bedrooms and common space for boarding students.*
 - o *Level 2 – Communal Space, Residential bedrooms for boarding students; residential apartments.*
 - o *Level 3 – Main pedestrian entry and reception/administration area, wellness area. Residential apartments for staff, residential bedrooms for boarding students.*
 - o *Level 4 – Residential bedrooms for boarding students.*
 - o *Level 5 – Residential bedrooms for boarding students.*
- + Landscaping and demolition works to the zone between the Mary Ward Block and the existing Boarding House dining area.

A.2 Aim

The aim of this report is to:

- + Undertake an assessment of the proposed new building against the Deemed-to-Satisfy (DtS) Provisions of the BCA 2016 Amendment 1.
- + Identify any BCA compliance issues that require resolution/attention for the proposed development.

A.3 PROJECT TEAM

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

- + Report Preparation – Brian Maguire
- + Peer Reviewer – Tony Heaslip

A.4 DOCUMENTATION

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

- + BCA 2016 Amendment 1 - Volume one
- + Guide to the BCA 2016.
- + Architectural plans prepared by **Allen Jack & Cottier:**

| DRAWING NUMBER | REV | DATE | DRAWING NUMBER | REV | DATE |
|----------------|-----|------------|----------------|-----|------------|
| DA0001 | - | Undated | DA1001 | - | Undated |
| DA1002 | - | Undated | DA1003 | - | Undated |
| DA1101 | - | Undated | DA2001 | 2 | 10.12.2018 |
| DA2002 | 2 | 10.12.2018 | DA2003 | 2 | 10.12.2018 |
| DA2004 | 2 | 10.12.2018 | DA2005 | 2 | 10.12.2018 |
| DA2006 | 2 | 10.12.2018 | DA2007 | 2 | 10.12.2018 |
| DA2008 | 2 | 10.12.2018 | DA3101 | 2 | 10.12.2018 |
| DA3102 | 2 | 10.12.2018 | DA3201 | - | Undated |
| DA3202 | - | Undated | DA3301 | - | Undated |
| DA8601 | - | Undated | DA8602 | - | Undated |
| DA8603 | - | Undated | DA8604 | - | Undated |
| DA8605 | - | Undated | DA8606 | - | Undated |



| DRAWING NUMBER | REV | DATE | DRAWING NUMBER | REV | DATE |
|----------------|-----|---------|----------------|-----|---------|
| DA8607 | - | Undated | DA8608 | - | Undated |
| DA8609 | - | Undated | DA8701 | - | Undated |
| DA9000 | - | Undated | DA9001 | - | Undated |

A.5 REGULATORY FRAMEWORK

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

Clause 143(3) of the EPA Regulation 2000 prevents a certifying authority from issuing a construction certificate if the proposed new work will result in a reduction to the fire protection and structural capacity of the building. *Note: this clause is not applicable for a new standalone development.*

A.6 LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- + The following assessment is based upon a review of the architectural documentation.
- + No assessment has been undertaken with respect to the Disability Discrimination Act (DDA) 1992. The building owner should be satisfied that their obligations under the DDA have been addressed.
- + The Report does not address matters in relation to the following:
 - i. Local Government Act and Regulations.
 - ii. NSW Public Health Act 1991 and Regulations.
 - iii. Occupational Health and Safety (OH&S) Act and Regulations.
 - iv. Work Cover Authority requirements.
 - v. Water, drainage, gas, telecommunications and electricity supply authority requirements.
- + BM+G Pty Ltd do not guarantee acceptance of this report by Local Council, NSW Fire Brigades or other approval authorities.
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A.7 TERMINOLOGY

Alternative Solution

A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DTS Provisions.

Building Code of Australia (BCA)

Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in New South Wales (NSW) under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance based format.

Construction Certificate

Building Approval issued by the Certifying Authority pursuant to Part 4A of the EP&A Act 1979.

Construction Type

The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Deemed to Satisfy Provisions (DTS)

Provisions which are deemed to satisfy the Performance Requirements.

**Exit**

An exit means –

- i. Any of a combination of the following if they provide egress to a road or open space:
 - a. An internal of external stairway
 - b. A ramp;
 - c. A fire isolated passageway
 - d. A doorway leading to a road or open space
- ii. A horizontal exit or a fire isolated passageway leading to a horizontal exit

Effective Height

The height to the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest storey providing direct egress to a road or open space.

Fire Resistance Level (FRL)

The grading periods in minutes for the following criteria-

- (a) structural adequacy; and
 - (b) integrity; and
 - (c) insulation,
- and expressed in that order.

Fire Source Feature (FSF)

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

Occupation Certificate

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

Open Space

A space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Requirements of the BCA

A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by-

- (a) complying with the DtS Provisions; or
- (b) formulating an Alternative Solution which-
 - (i) complies with the Performance Requirements; or
 - (ii) is shown to be at least equivalent to the DtS Provisions; or
- (c) a combination of (a) and (b).

Sole Occupancy Unit (SOU)

A room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes a dwelling.



B. BUILDING CHARACTERISTICS

B.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the proposed new boarding house building:

| | |
|---|--|
| ▪ BCA Classification***: | Class 2 (Residential apartments for Staff) Class 3 (Boarding House Accommodation) Class 7a (Carpark) Class 9b (Assembly areas) |
| ▪ Rise in Storeys: | The building has a rise in storeys of six (6)* |
| ▪ Effective Height: | Greater than 12m (197.2 – 181.9 = 15.3) |
| ▪ Type of Construction: | Type A Construction |
| ▪ Climate Zone: | Zone 5 |
| ▪ Importance Level | The Building is Importance Level 3 |
| ▪ Maximum Floor Area/ Volume: | Not applicable to Class 3 parts of the building. Class 9b – Maximum Floor area 8,000m ² , Maximum Volume of 48,000m ³ Class 7a** – Maximum Floor area 5,000m ² , Maximum Volume of 30,000m ³ |
| Note: The size of the fire compartment is not exceeded with this development. | |

*Elevations and Section will demonstrate whether the building has a rise in storeys of 6 or 7.

**A sprinklered carpark does not have a floor area limitation.

***The Mary Ward building portion to be demolished is a mixture of Class 9b, Class 5 and Class 3 parts. It is not assessed as part of this description given the works are of a minor 'make good' nature.

B.2 FIRE SOURCE FEATURE

The distances from the nearest Fire Source Features are:

| Boundary | Distance to Fire Source Feature |
|----------|---|
| North | >6m from the boundary / adjoining building |
| East | >6m from the far side of Mount Pleasant Ave |
| South | >6m from any adjacent building or boundary |
| West | >6m from any adjacent building or boundary |



C. SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance items that will need to be addressed prior to issue of the respective Construction Certificates:

C.1 MATTERS REQUIRING FURTHER INFORMATION/PLAN AMENDMENTS

| | BCA CLAUSES | DESCRIPTION |
|----|-------------|--|
| 1. | C2.7/C2.8 | Fire wall construction is required to separate the Class 9b and the Class 3 parts of the building. |
| 2. | C3.3 | Exposure of external walls and openings of different fire compartments is to be addressed to the degree necessary to address Performance Requirement CP2. |
| 3. | D1.7 | Discharge from the fire isolated stairs requires protection of openings to the degree necessary to satisfy Performance Requirements DP5 |
| 4. | E1.3 | Fire Hydrant booster assembly infrastructure is to be further assessed, i.e. location with respect to the main vehicular entry and being within site of the designated building entry point. |
| 5. | D2.20 | The swing of doors in required exits are to swing in the direction of egress. |

C.2 MATTERS TO BE JUSTIFIED AS FIRE SAFETY ENGINEERED OR OTHER PERFORMANCE SOLUTIONS

| | BCA CLAUSES | DESCRIPTION | PERFORMANCE REQUIREMENT |
|--|-------------|---|-------------------------|
| 1. | C3.2 | Construction over inter-allotment boundaries (if lot consolidation does not occur) | CP1, CP2 |
| 2. | D1.4 | The distance to an exit from the Level 2 balcony exceeds 20m (approx. 23m). | DP4, EP2.2 |
| 3. | D1.5 | The distances between alternative exits at Level 1 and Level 2 exceeds the maximum 45m for a Class 3 building (approx. 67m) | DP4[SM1] |
| PERFORMANCE SOLUTION - NOT FIRE ENGINEERING | | | |
| 4. | Part F1 | A solution is required for the external walls to confirm the assembly prevents the penetration of water that could cause unhealthy or dangerous conditions, or loss of amenity for occupants; and undue dampness or deterioration of building elements. | FP1.4 |



D. BCA ASSESSMENT

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

The following comments have been made in relation to the *proposed new Boarding House* and its compliance with the relevant provisions of the BCA associated with the proposed development.

SECTION A – CLASSIFICATION OF BUILDINGS & STRUCTURES

1. Clause 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.

2. Clause A3.3 – Multiple Classification

Each part of a building must be classified separately and where these parts have different purposes – If not more than 10% of the floor area of a storey – being the minor use, is used for a purpose which is a different classification applying to the major use, may apply to the whole storey. Note: This provision does not apply to certain minor uses set out in this clause.

Comments: *The Building contains multiple classifications.*

SECTION B – STRUCTURE

3. Part B1 – Structural Provisions

Structural engineering details prepared by an appropriately qualified structural engineer to demonstrate compliance with Part B1 in relation to the new structural elements of the building.

Comments: *Details are to be provided confirming that the design achieves compliance with the following is required at the time of the application for construction certificate, inclusive of reference to the following Australian Standards (where relevant):*

- + AS 1170.0 – 2002 General Principles
- + AS 1170.1 – 2002, including certification for balustrading (dead and live loads)
- + AS 1170.2 – 2002, Wind loads
- + AS 1170.4 – 2007, Earthquake loads
- + AS 3700 – 2001, Masonry code
- + AS 3600 – 2009, Concrete code
- + AS 4100 – 1998, Steel Structures and/or
- + AS 4600 – 2005, Cold formed steel.
- + AS 2159 – 1995 or 2009, Piling
- + AS 1720.1 – 2010, Design of timber structure
- + AS/NZS 1664.1 and 2 – 1997, Aluminium construction
- + AS 2047 – 1999, Windows in buildings.
- + AS 1288 – 2006, Glass in buildings.

Note 1: *Termite risk management complying with AS3660.1 is required to be considered where a primary building element is subject to attack by termites.*

Note 2: *The building is Importance Level 3 for the purpose of the Structural Engineer's design*

SECTION C – FIRE RESISTANCE

PART C1 FIRE RESISTANCE AND STABILITY

4. Clause C1.1 – Type of Construction Required

The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1 except as allowed for in this clause.

Comments: *The building is required to comply with the requirements of Type A Construction. Appendix 1 is an extract from Table 3 in BCA Specification C1.1 for reference.*

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

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

Comments: *The building has a rise of storeys of six (6). Further information regarding elevations and sections will determine if the basement level increases the rise in storeys to 7.*



6. Clause 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 storeys. This clause also contains exceptions in relation to Class 4 parts.

Comments: *The building is a Class 3 boarding house with Class 7a carparking and Class 9b communal and assembly areas.*

7. Clause C1.8 – Lightweight Construction

Lightweight construction must comply with Specification C1.8 if used in a wall system in accordance with sub-clauses (a) & (b).

Comments: *Confirmation is to be provided with the application for Construction Certificate for any proposed fire rated lightweight construction (eg. bounding walls not of masonry).*

8. Clause C1.9 – Non-combustible Materials

The materials as set out in sub-clauses (a) to (e) of this clause, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required.

Comments: *Compliance readily achievable. Details demonstrating specific compliance will need to be provided at the Construction Certificate stage particularly with regard to the proposed sheet cladding.*

9. Clause C1.10 – Fire Hazard Properties

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

Comments: *Material test data sheets will need to be submitted for further assessment to ensure compliance with the above (relevant to the Construction Certificate Stage).*

10. C1.14 Ancillary elements - An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is one of the following:

- (a) An ancillary element that is non-combustible.
- (b) A gutter, downpipe or other plumbing fixture or fitting.
- (c) A flashing.
- (d) A grate or grille not more than 2 m² in area associated with a building service.
- (e) An electrical switch, socket-outlet, cover plate or the like.
- (f) A light fitting.
- (g) A required sign.
- (h) A sign other than one provided under (a) or (g) that—
 - i. achieves a group number of 1 or 2; and
 - ii. does not extend beyond one storey; and
 - iii. does not extend beyond one fire compartment; and
 - iv. is separated vertically from other signs permitted under (h) by at least 2 storeys.
- (i) An awning, sunshade, canopy, blind or shading hood other one provided under (a) that—
 - i. meets the requirements of Table 4 of Specification C1.10 as for an internal element; and
 - ii. serves a storey—
 - (A) at ground level; or
 - (B) immediately above a storey at ground level; and
 - iii. does not serve an exit, where it would render the exit unusable in a fire.
- (j) A part of a security, intercom or announcement system.
- (k) Wiring
- (l) A paint, lacquer or a similar finish.
- (m) A gasket, caulking, sealant or adhesive directly associated with (a) to (k)

Comment: *Compliance is readily achievable.*

Note: *The vertical aluminium battens if located above Ground Level are required to be non-combustible i.e. pre-finished metal sheeting having a combustible surface not exceeding 1mm in thickness.*



PART C2 COMPARTMENTATION AND SEPARATION

11. Clause C2.1 – Application of Part

C2.2, C2.3 & C2.4 do not apply to a carpark provided with a sprinkler system complying with Specification E1.5, an open deck carpark or an open spectator stand.

Comments: It is understood that the carpark located on Ground Level will be fitted with a sprinkler system complying with E1.5 therefore the requirements of C2.2, C2.3 & C2.4 do not apply.

12. Clause C2.6 – Vertical Separation of Openings in External Walls

If in a building of Type A construction, any part of a window or other opening in an external wall is above another opening in the storey next below and its vertical projection falls no further than 450 mm outside the lower opening (measured horizontally), the openings must be separated by a horizontal or vertical spandrel with an FRL of 60/60/60, and for the purposes of C2.6, window or other opening means that part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

Comments: Spandrel protection is not required as the building is understood to be provided with sprinklers throughout complying with AS2118.1-1999.

13. Clause C2.7 – Separation by Fire Walls

Separation of building classifications for construction must be constructed in accordance with the following:

- + The fire wall has the relevant FRL prescribed by Specification C1.1 for each of the adjoining parts.
- + Any openings in a fire wall must not reduce the FRL required by Specification C1.1 for the fire wall, except where permitted by the Deemed-to-Satisfy Provisions of Part C3 (i.e. fire doors; protection of services).
- + Building elements, other than roof battens with dimensions of 75 mm x 50 mm or less or sarking-type material, must not pass through or cross the fire wall unless the required fire resisting performance of the fire wall is maintained.

Comments: Compliance is readily achievable. **Applies to the separation of Class 9b and Class 3 areas.** See further comments under C2.8.

Fire walls are to extend the full extent of the proposed external walls to ensure the integrity of the fire wall is maintained.

14. Clause C2.8 – Separation of Classifications in the Same Storey

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

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

Comments: The Class 9b and Class 3 areas are to be separated in accordance with this Clause, construction that achieves an FRL of 120/120/120 with self closing 120/30 fire doors. This occurs at Basement 1, Lower Ground and Ground Floor.

The Wellness Centre also needs to be separated from the corridor by way of the same method of construction.

*There is potential for glazing to be used in the main common areas, dining areas and reception as the separating wall, subject to a **Fire Engineered solution** (which may include the need for drenchers to be provided to both sides of any proposed glazing).*

15. Clause C2.9 – Separation of Classification in Different Storeys

This clause specifies the required separation between parts of a building which are of a different classification, situated one above another, to minimise the risk of a fire in one classification causing the failure of building elements in another classification in a different storey.

Comments: By virtue of the building accommodating a number of classifications distributed in separate levels, separation is required between these levels as follows:

- + Class 9b Assembly/Class 3 boarding house accommodation is required to be separated by construction achieving an FRL not less than 120/120/120.

This clause does not apply to the floor separating the floors separating the Class 3 parts. These elements are addressed in BCA Spec C1.1.



16. Clause C2.10 – Separation of Lift Shafts

Any lift connecting more than 2 stories or more than 3 stories if the building is sprinklered must be separated from the remainder of the building by an enclosure achieving the required FRL's prescribed in Spec C1.1 if load bearing or be of non-combustible construction if non-loadbearing.

Comments: In this instance the lift serves all levels therefore requiring an FRL of not less than 120/120/120. Details demonstrating compliance are required at the Construction Certificate stage.

17. Clause C2.12 – Separation of Equipment

Equipment as listed below must be separated from the remainder of the building with construction that achieves an FRL of 120/120/120 and doorways being self-closing -/120/30 fire doors:

- + Emergency generators used to sustain emergency equipment operating in the emergency mode; or
- + Central smoke control plant; or
- + Boilers; or
- + A battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.
- + Separation of on-site fire pumps must comply with the requirements of AS 2419.1.

Comments: Compliance is readily achievable. Confirmation demonstrating specific compliance for any batteries with amps and voltage more than that listed above will need to be provided at the Construction Certificate stage.

18. Clause C2.13 – Electricity Supply System

The following areas are to be fire separated from the remainder of the building by construction that achieves an FRL of 120/120/120:

- + An electricity substation located within a building.
- + A main switchboard which sustains emergency equipment operating in the emergency mode.
- + If electrical conductors located within a building supply a substation (located within the building) which also supplies the main switchboard; or they supply the main switchboard itself must be fire separated by a construction that achieves 120/120/120 or alternatively:
 - + Have a classification in accordance with AS/NZS 3013 of not less than –
 - + If located in a position that could be straight to damage by motor vehicles – WS53W; or
 - + Otherwise – WS52W.
- + Where emergency equipment is required in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment switchgear is separated from the non-emergency equipment switchgear by metal partitions designed to minimise the spread of fault from the non-emergency equipment switchgear, eg:
 - + Fire hydrant booster pumps.
 - + Pumps for automatic sprinkler systems, water spray, chemical fluid suppression systems or the like.
 - + Pumps for fire hose reels where such pumps and fire hose reels form the sole means of fire protection in the building.
 - + Air handling systems designed to exhaust and control the spread of fire and smoke.
 - + Emergency lifts.
 - + Control and indicating equipment.
 - + Sound systems and intercom systems for emergency purposes

Comments: Compliance readily achievable. Details demonstrating specific compliance in relation to proposed pump rooms will need to be provided to the Principal Certifier at the Construction Certificate stage.



19. Clause C2.14 – Public Corridors in Class 2 and Class 3 buildings

In a Class 2 or Class 3 building, a public corridor, if more than 40m in length, must be divided at intervals of not more than 40m with smoke proof walls complying with Clause 2 of Specification C2.5.

Comments: Compliance is required. A smoke separating door is to be provided in the public corridors on the Level 2, Level 1 and Ground Floor, Level 1, Level 2, Level 3 and Level 4 that complies with Specification C2.5 in order to reduce the corridors to less than 40m in length. Smoke doors are required to swing in both directions. The separation between Class 3 and Class 9b areas addresses this requirement on the other levels.

PART C3 PROTECTION OF OPENINGS

20. Clause C3.2 – Protection of Openings in External Walls

Openings in an external wall that is required to have an FRL must –

- + If the distance between the opening and the fire-source feature to which it is exposed is less than –
 - + 3 m from a side or rear boundary of the allotment; or
 - + 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
 - + 6 m from another building on the allotment that is not a Class 10, be protected in accordance with C3.4 and if wall-wetting sprinklers are used, they are located externally; and
- + If required to be protected they must not occupy more than 1/3 of the area of the external wall of the storey in which it is located unless they are in a Class 9b building used as an open spectator stand.

Comments: There are no openings in external walls that are exposed to a side or rear boundary of the school property.

However, should the subject building be located within 3m of (or located over an internal inter-allotment boundary (due to the nature of the school being made up of many different allotments) it is recommended that this be addressed as a **Fire Engineered Performance Solution** (based on common ownership an unlikelihood of the individual properties changing ownership). Alternatively, the subject allotments can undergo a consolidation to avoid the conflict with boundaries and building locations.

21. Clause C3.3 – Exposure of External Walls/Opening 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 be not less than that set out in Table C3.3 unless–

- + Those parts of each wall have an FRL not less than 60/60/60; and
- + Any openings protected in accordance with C3.4.

Comments: The external walls of the Class 3 parts and Class 9b where dividing by fire walls are exposed to one and other are to be constructed to achieve an FRL of 60/60/60 and any openings protected by external drenchers in accordance with Clause C3.4.

Alternatively, there may be scope to introduce **Fire Engineering** to account for protection of the glazed wall of the Class 9b space in lieu of needing protection of the residential unit windows in some instances.

22. Clause C3.4 – Acceptable Methods of Protection

Where protection is required, doorways, windows and other openings must be protected as follows:

- + Doorways –
 - + Internal or external wall- wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or
 - + -/60/30 fire doors that are self-closing or automatic closing.
- + Windows –
 - + Internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or
 - + -/60/- automatic closing fire shutters.



- + Other openings –
 - + Excluding voids – internal or external wall-wetting sprinklers, as appropriate; or
 - + Construction having FRL not less than -/60/-.

Comments: See above with respect to Lower Ground Floor. Basement 1 protection of the external wall of the pump room can be addressed also with Fire Engineering, based on the fire protection being absorbed into the Fire Services pump room.

23. Clause C3.5 – Doorways in Fire Walls

Openings in fire walls, that are not part of a horizontal exit, must be protected in accordance with one of the methods set out in this clause.

Fire shutters installed to openings in fire walls must be self closing or automatic in accordance with the requirements set out in this clause.

Comments: Compliance is readily achievable. See above for potential Fire Engineering solution for glazed drenched walls rather than fire doors.

24. Clause C3.9 – Service Penetrations in fire isolated exits

Fire isolated exits must not be penetrated by any services other than electrical wiring as permitted by D2.7, ducting associated with a pressurisation system or water supply pipes for fire services.

Comments: Compliance is readily achievable.

25. Clause C3.10 – Openings in fire isolated lift shafts.

If lift shafts are required to be fire-isolated an entrance doorway must be protected by -/60- fire doors and the lift indicator panels must be backed by construction having an FRL of not less than -/60/60 if it exceeds 35000mm²

Comments: Compliance is readily achievable.

26. Clause C3.11 – Bounding Construction: Class 2, 3 & 4 Buildings

Protection is required to the bounding walls of sole-occupancy units or public corridors in Class 2 & 3 buildings and Class 4 portions of buildings of Types A, B & C Construction. Namely:

- + Doorways must be protected if providing access from an SOU to a
 - + Public corridor;
 - + A room not within an SOU; or
 - + The landing of an internal non-fire isolated stairway that serves a required exit; or
 - + Another SOU
- + A doorway must be protected if it provides access from a room not within an SOU to a public corridor or the like; or to the landing on a non-fire isolated stairway that serves as a required exit.
- + Protection of the doorway must be -/60/30 self-closing fire door in Type A Construction, and a self-closing tight fitting solid core door in Type B and Type Construction.

Comments: Further information required. Applies to all the rooms associated with the Class 3 spaces, including bathrooms and sanitary facilities. [SM2]

27. Clause C3.12- Openings in floor and ceilings for services

This clause applies to the floors and ceilings in buildings of Types A, B & C Construction and sets out the methods required to limit the spread of fire through openings in these building elements, required to resist the spread of fire.

Comments: Compliance is readily achievable.

28. Clause C3.13 – Openings in shafts

This clause specifies that in buildings of Type A Construction, openings in shafts must be protected (generally with 1 hour fire rated shafts and doors).

Comments: Compliance is readily achievable. Details demonstrating compliance are to be provided at the Construction Certificate stage.



29. Clause C3.15 – Openings for Service Installations

The clause details the requirements for protection of service openings in building elements that have an FRL, to prevent the spread of fire. C3.15 only applies only to an element required to have an FRL with respect to integrity or insulation.

Specification C3.15 prescribes materials and methods of installation for services that penetrate walls, floors and ceilings required to have an FRL. Where the mechanical ventilation system penetrates floors or walls that require an FRL the installation is to comply with AS/NZS 1668.1.

Comments: *Compliance to be demonstrated with the Construction Certificate application documentation.*

SECTION C – SPECIFICATIONS

30. Specification C1.1 – Fire Resisting Construction

The building works are required to comply with the requirements detailed under Table 3 of Specification C1.1 for Type A Construction (see appendix 1).

Comments: *Compliance is readily achievable for the requirements of Type A Construction, See the Appendix for the table of relevant fire resistance levels. Notes below to highlight relevant items:*

- a) *The concession granted under clause 3.5 of Specification C1.1 results in the roof of the building not being required to be fire rated (if the building is a Class 2 and less than 25m in effective height, or if the building is provided throughout with sprinklers). The roof covering however must be non-combustible.*
- b) *Top storey construction is to allow for fire rated separating walls not to be passed by structure (unless by 50x75mm roof battens).*
- c) *If the upper level loadbearing fire rated structure is provided lateral or other support by the roof members, the top level ceiling is to have resistance to the insipient spread of fire for 60 minutes.*
- d) *Where a combustible material is used as a finish or lining to a wall or roof, or sunscreen, or awning, to a building element required to have an FRL the material must be exempted or complies with the fire hazard properties prescribed under C1.10 and does not otherwise constitute an undue risk of fire spread via the façade of the building.*
- e) *Lift shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL of 90/90/90.*
- f) *Where roof lights are proposed they are required to be located not less than 3 metres from a roof light in an adjoining fire separated part; and must not be more than 20% of the area of the roof.*
- g) *A non-loadbearing wall that is required to be fire resisting must be non-combustible construction.*
- h) *Any internal columns in this Class 3 building (being less than 25m in effective height) that are in the storey immediately below the roof, can be constructed of an FRL of 60/60/60.*
- i) *The walls to fire rated shafts must achieve the fire rating from both directions i.e. from inside and outside the shaft. Services shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL similar to the shaft.*
- j) *Any lintels within any walls required to be fire rated will achieve the same fire rating as the walls within which they are located. This is not applicable if the opening is less than 3m wide and the masonry is non-load bearing or less than 1.8m wide of the masonry is loadbearing.*



SECTION D – ACCESS & EGRESS

PART D1 PROVISION FOR ESCAPE

31. Clause D1.2 – Number of Exits Required

This clause requires the provision of sufficient exits to enable safe egress in case of an emergency. D1.2 provides that all buildings must have at least one exit from each storey and sets out circumstances in which more than one exit may be required (particularly in relation to class 9 buildings).

Comments: *An adequate number of exits is provided from each part of the building.*

32. Clause D1.3 – When Fire-isolated Stairways & Ramps are Required

This clause indicates when fire isolated stairways and ramps are required to enable safe egress from a building in the case of a fire, setting out the limits to which non-fire isolated exits can be used in Class 2, 3, 5, 6, 7, 8 and 9 buildings. Particular exceptions apply to Class 9a patient care and also class 9c aged care buildings.

Class 5, 6 and 7a – every stairway must be fire isolated if it connects more than 2 consecutive storeys. Concessions apply to inclusion of an additional storey, or sprinklers, as per the above.

Comments: There are three (3) required fire isolated exits from the building (connecting / passing by more than 3 storeys in a sprinklered building). The remaining exits are required non-fire isolated stairs.

33. Clause D1.4 – Exit Travel Distances

This clause specifies the permitted travel distances allowable from Class 2 to Class 9 buildings, specifying the maximum distances to be taken into account for the various uses in each Class of building.

The following applies:

In a class 3 part of a building:

- + The entrance doorway must not be more than 6m from an exit or 6m from a point where a choice between alternative exits is available.
- + 20m from a single exit serving the storey at the level of egress to a road or open space
- + No point on the floor of a room which is not in a SOU must be more than 20m from an exit or from a point at which travel in different directions to 2 exits is available.

In a class 5, 6, 7a and 8 building:

- + No point on the floor must be more than 20m to 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 40m;
- + For the class 5 and 6, the distance to a single exit serving a storey at the level of access to a road or open space may be increased to 30m.

Comments: *Compliance with D1.4 has generally been achieved throughout the building with the following departures identified:[SM3]*

- + Basement Level 2: *Complies.*
- + Basement Level 1: *Complies. 4 off exits are available.*
- + Level 1: *Complies, based on a Horizontal Exit between the common space and the Dining Hall, and also a hinged door to the loading dock.*
- + Level 2: *Complies.*
- + Level 3: *Complies 2 x Fire Isolated Exits for the Class 3; Main Entry; Student Entry.*
- + Level 4: *Complies. All parts of the floor are within 6m of a point of choice to alternative exits (class 3 SOU doors); or no further than 20m to a point where alternative exits are available (spaces not within an SOU).*
- + Level 5: *Complies.*

34. Clause D1.5 – Distances Between Alternative Exits

Exits required as alternative exits must be –

- + 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



- + not less than 9m apart; and
- + not more than –
 - in a Class 2 or 3 building - 45m apart; or
 - In a Class 9a health-care building, if such required exit serves a patient care area – 45m apart; or
 - In all other cases– 60m apart.
- + Located so that the alternative paths of travel do not converge such that they become less than 6m apart.

Comments: Level 4 and Level 5 have exits that exceed the maximum 45m, in this instance up to 67m. Combining smoke separation in corridors (see C2.14) and also the inclusion of sprinklers in the building can lead to the justification of these travel distances by way of a **Fire Engineered Performance Solution**. [SM4]

Compliance is achieved for the remainder of the building.

35. Clause D1.6 – Dimensions of Exits

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

Comments[SM5]: Compliance is readily achievable. Stairs and other paths of travel are to be a minimum of 1m in width and 2m in height. Details to be provided with the Construction Certificate documentation.

36. Clause D1.7 – Travel Via fire-isolated Exits.

A doorway from a room must not open directly into a stairway, passageway or ramp that is required to be fire-isolated unless it is from a public corridor/lobby, sole-occupancy unit occupying all of a storey or a sanitary compartment/airlock.

Each fire isolated stairway or ramp must provide independent egress from each storey served and must discharge to –

- + A road or open space; or
- + To a point in a space within the building that is only used for pedestrian movement or car parking that is open a minimum of 2/3 of its perimeter and from which a path of travel under 20m is available to a road or open space; or
- + A covered area that adjoins a road or open space, is open for a minimum of 1/3 of its perimeter, has an unobstructed height of at least 3m throughout and provides a path of travel the point of discharge to a road or open space within 6m.

Where a path of travel from the point of discharge of a fire isolated exit necessitates passing within 6m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have –

- + an FRL of not less than 60/60/60; and
- + Any openings protected internally in accordance with BCA Clause C3.4,
- + For a distance of 3m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

Comments[SM6]: There are three (3) fire Isolated Exit stairs designed for this building. Where the stairs discharges at a point that necessitates passing by window openings in the external walls such external walls need to be constructed to achieve an FRL of 60/60/60 and the windows need to be protected internally in accordance with C3.4, i.e. with windows being closed at the time. [SM7]

37. Clause D1.9 – Travel by Non-fire-isolated Stairways or Ramps

A non-fire isolated stairway or 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 available. This clause sets out the prescribed travel distances to be provided in required exits of Class 2 to 9 buildings and Class 4 parts of buildings, and also maximum total distances to be taken into account for the various uses in each Class of building.

Comments: Complies. The designated exits from stairs that are not fire isolated comply with the requirements of this clause, i.e no more than 80m travelled, discharge no further than 15m from a door leading to open space.



38. Clause D1.10 – Discharge From Exits

Upon egress occupants must have suitable paths of travel including compliant stairways and ramps (where required) between the building and the Roadway. Graded surfaces such as the vehicular ramp must not be steeper than 1:8 and may require handrails.

Bollards are required to exit doors where they could be potentially blocked by vehicles. This will also include the discharge points of the stair to the car parking area to ensure that a clear 1 metre wide path of travel is provided to the public roadway. Bollards may also be required each side of the exit door discharging to Princes Lane.

Comments: Compliance is readily achievable. The exits all discharge to open space, areas of which comprise the existing school oval. Design for external areas is to take into account the gradients to ensure appropriate steps. Stairs, ramps and handrails are incorporated.

39. Clause D1.12 – Non-required Non-Fire isolated Stairs or ramps[SM8]

This clause prohibits the use of non-fire isolated stairs in certain buildings (Class 9a, 9c) and places restrictions on the location of stairs and the restrictions of the number of connecting levels in both sprinklered and non-sprinklered buildings.

Comments: Complies. The stair connects 3 storeys only and it discharges on Level 3 being the Main Entry of the building.

PART D2 CONSTRUCTION OF EXITS

40. Clause D2.2 – Fire-isolated Stairways & Ramps

A stairway or ramp, including landings that are required to be within a fire-resisting shaft must be constructed of non-combustible materials to protect the structural integrity of the shaft.

Comments: Compliance readily achievable. Details to be provided at the Construction Certificate stage.

41. Clause D2.3 – Non-fire isolated stairways and ramps

In a building having a rise in storey of more than 2, required stairs and ramps which are not required to be within a fire resisting shaft must be constructed of:

- + Non-combustible materials to protect the structural integrity of the shaft.
- + Reinforced prestressed concrete
- + Steel that in no part is less than 6mm thick

Comments: Not applicable. The only stair connecting levels within the building is required to be fire isolated.

42. Clause D2.4 – Separation of Rising & Descending Stair Flights

If a stairway serving as an exit is required to be fire-isolated there must be no direct connection between the rising and descending flights of stairs at the level from which egress is obtained. This clause also prescribes that the level of construction be some proof in accordance with BCA Specification C2.5.

Comments: Compliance is readily achievable.

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

This clause restricts the installation of certain services in fire-isolated exits, non-fire-isolated exits and certain paths of travel to exits. It prescribes which services shall not be installed as well as the circumstances in which certain services may be installed in fire-isolated and non-fire-isolated exits.

If installed in a path of travel to an exit, Electrical distribution boards, Communication cupboards and the like containing motors, etc are to be enclosed with non-combustible construction, and doors are to be provided with smoke seals to the perimeter.

Comments: Compliance is readily achievable.

44. Clause D2.8 – Enclosure of Space Under Stairs & Ramps

A space below a required fire-isolated stairway or ramp in a fire-isolated shaft must not be enclosed to form a cupboard or other enclosed space. If the required stairway or ramp is non-fire-isolated, (including an external stairway) any cupboard underneath must have an FRL of 60/60/60, with a self-closing -/60/30 door.

Comments: Complies. The fire isolated stairs do not have storage located within or beneath, nor do the non-fire isolated exit stairs have enclosures proposed beneath.



45. Clause D2.11 – Fire-isolated Passageways

A fire-isolated passageway must have a FRL at least equivalent to the part of the building in which it is situated and in any case not less than 60/60/60.

A concession in relation to the construction of the top of a fire-isolated passageway is available under certain circumstances.

Comments: *Not applicable to this development.*

46. Clause D2.13 – Goings & Risers

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

Comments: *All stairways must comply with the geometry requirements of D2.13, an extract of the limitations is provided below. All stairs are to have solid risers, and are to have contrasting nosings (in accordance with AS1428.1), slip resistant surfaces throughout in accordance with the requirements for stairs set out by Clause D2.14.*

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

47. Clause D2.14 – Landings

The dimensions and gradients of landings in stairways are set out in this clause; the configuration will depend on the proposed use of a building, and specific requirements apply to a class 9a building.

Comments: *Compliance is readily achievable.*

48. Clause D2.15 – Thresholds

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the door opens to a road or open space, external stair landing or external balcony; and the door sill is not more than 190mm above the finished surface of the external level.

Comments: *Compliance is readily achievable.*

49. Clause D2.16 – Balustrades or Other Barriers

This clause details where balustrades are required to be provided and sets out in specific detail the construction requirements. Typically the following will apply to this class of building:

- + Balustrades are required where the fall to the level below is more than 1m in height. The minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp.
- + For a fall of more than 4m to the surface level below, a window sill must be a minimum of 865mm in height above the height of the floor surface.
- + Where the floor is more than 4m above the surface beneath; the balustrade must not have any horizontal or near horizontal members between 150mm and 760mm above the floor that could facilitate climbing.
- + Balustrades must be constructed so as to not permit a sphere of 125mm diameter to pass through. The exception to this is within fire isolated exits within the building, or within a class 7 or 8 building, where the rails can be positioned a maximum of 460mm apart, so long as a bottom rail is located so a sphere of 150mm cannot pass through the opening between the nosing of the stair treads and the rail or between the floor of the landing, balcony or the like.

Comments: *Compliance is readily achievable. Further detail required at the Construction Certificate stage.*

50. Clause D2.17 – Handrails

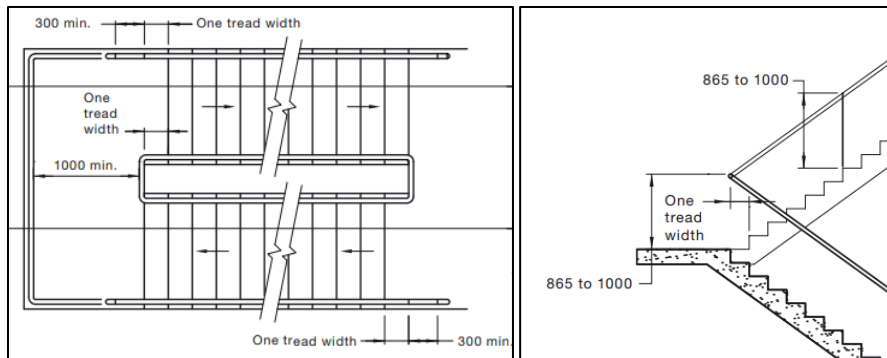
This Clause sets out the requirements regarding the location, spacing and extent of handrails required to be installed in buildings.

Handrails are required within stairs and ramps in the building. Handrails are also required to any stair or ramp located within a class 2, 3 or class 4 part SOU, located along at least one side.

Handrails are required to be not less than 865mm in height vertically above the nosings of the stair tread.

Handrails are required to be designed in accordance with Clause 12 of AS1428.1-2009.

Comments: Compliance is readily achievable. The centrally located fire isolated stair is to be provided with off-set treads to enable compliant handrail geometry (see the below images).



51. Clause D2.19 – Doorways & Doors

This clause applies to all doorways and refers to the types of doors that cannot be used in buildings of prescribed uses, the use of power operated doors and the force required to operate sliding doors.

A doorway in a required exit (eg the doors leading to a fire isolated exit, or the doors leading directly to open space) must not be fitted with a sliding door unless it leads to a road or open space; and the door is able to be opened manually under a force of not more than 110N. If the door is also power operated, it must be opened manually under a force of not more than 110N if there is a malfunction or failure to the power source; or upon the activation of a fire or smoke alarm anywhere in the fire compartment served by the door.

Comments: Not applicable. No sliding doors are noted on the architectural documentation.

52. Clause D2.20 – Swinging Doors

A swinging door in a required exit or forming part of a required exit must swing in the direction of egress and must not otherwise impede egress. In addition, the door must not encroach at any part of its swing by more than 500mm on the required width of the exit (with the exception of airlocks and sanitary compartments, and with the exception of buildings or building parts that are less than 200m²). This clause does not apply to other doorways.

Comments: Compliance is generally achieved with the following exceptions:

- + Inward swinging double leaf door discharging from the Communal space at Lower Ground.
- + Doors in smoke walls need to swing in both directions.

53. Clause D2.21 – Operation of Latch

A door in a required exit or forming part of a required exit and in a path of travel to a required exit must be readily openable without a key from the side that faces a person seeking egress, by a single downward action or pushing action on a single device which is located between 900mm & 1.1m from the floor. This clause prohibits the use of devices such as deadlocks and knobs (rather, lever latches are required). D2.21 also sets out exceptions in relation to buildings where special security arrangements are required in relation to the uses carried out.

Where fitted with a fail-safe device which automatically unlocks the door upon the activation of a sprinkler system or detection system, the above need not apply.

Comments[SM9]: Compliance is readily achievable.

Details on the type of latching device to be provided with the submission of the Construction Certificate application.

54. Clause D2.22 – Re-entry from fire-isolated exits

Doors of a fire-isolated exit must not be locked from the inside in a Class 9a health-care building, a Class 9c aged care building and in a fire-isolated exit serving a storey above 25m effective height, throughout the exit.

This clause details the exceptions to the above requirements if the doors are fitted with an automatic failsafe device that automatically unlocks the door upon the activation of a fire alarm as follows:

- + On at least every fourth storey, the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or

An intercommunication system, or an audible or visual alarm system, operated from within the enclosure is provided near the doors and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

Comments: Not Applicable. The building does not exceed 25m in effective height.

55. Clause D2.23 – Signs on Doors

This clause requires the use of signs to alert persons that the operation of smoke doors and fire doors and doors discharging from fire isolated exits, must not be impaired and must be installed where they can be readily seen.

Comments: Compliance is readily achievable.

Any new **self-closing** fire and/or smoke doors leading into the fire stair or forming part of a Horizontal Exit or smoke compartment are to be provided with signage as follows:



Any new **automatic closing** fire and/or smoke doors which are held on hold open devices that leads into the fire stair or forming part of a Horizontal Exit or smoke compartment are to be provided with signage as follows:



In addition to the above, the doors which provide access to the fire isolated exits and also the Horizontal Exits must have signage provided adjacent to the entry doorway which states the following (ref Clause 183 of EP&A Reg 2000):

56. Clause D2.24 – Protection of openable window

This clause relates to the protection of openable windows in a class 9b early childhood centre, or openable windows in a bedroom in a class 2 or 3 building or a class 4 part of a building, where the floor level is more than 2m above the surface level beneath. The intent of this clause is to limit the risk of a person (especially a young child) falling through an openable window, however it does not apply to such a window where the lowest level of its window opening is less than 1.7m above the floor. Details for protection include the following:

- Openable portion of the window must have a device to restrict the window opening; or
- Be fitted with a screen with secure fittings;
- Not permit a sphere of 125mm to pass through;
- Resist outward horizontal action of 250N;
- Have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden.

Furthermore, floors that are more than 4m above the surface level below, a barrier with a height not less than 865mm above the floor is required for all openable windows. The barrier must permit a sphere of 125mm to pass through, and must not have any horizontal or near horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Comment: Compliance is readily achievable. Details are to be provided with the Construction Certificate application.



PART D3 ACCESS FOR PEOPLE WITH A DISABILITY

57. Clause D3.1 – General Building Access Requirements.

The extent of access required depends on the classification of the building. Buildings and parts of buildings must be accessible as set out in Table D3.1 unless exempted by Clause D3.4.

Comments: Compliance readily achievable. A minimum of two accessible units are required. Furthermore, access to each level of the building and communal space provided must be maintained. Specific compliance in this regard is to be the subject of assessment from an accredited Access Consultant.

58. Clause D3.2 – General Building Access Requirements for People with Disabilities

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

Access must be provided through the principal pedestrian entrance and through not less than 50% of all pedestrian entrances (including the principal pedestrian entry).

In addition, as the building is greater than 500m², the non-accessible entrance must not be greater than 50m from an accessible entrance.

The minimum width of an accessible doorway must have a clear opening width of not less than 850mm in accordance with AS1428.1.

Comments: Compliance is readily achievable.

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

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

Comments: The following is a summary of some of the key matters which will need to be considered:

Access for persons with disabilities must be provided, at a minimum, to and within all areas normally used by the occupants. In this instance it is noted that a stair is located in the corridor providing access to the Retail waste bin storage area, contrary to this clause.

The minimum width of an accessible doorway must have a clear opening width of not less than 850mm in accordance with AS1428.1.

Circulation space to the new doorways that are required to be accessible are to comply with section 13 of AS1428.12009.

Stairways

- + Every common area stairway must be constructed in accordance with Clause 11 of AS1428.1.
- + Stairs shall have opaque risers (i.e. Solid)
- + Stair nosing's shall comply with the following diagram, which achieve a colour contrast luminance of 30% to the background (tread):
- + Stairways are to be served by Tactile Ground Surface Indicators in accordance with AS1428.4.1.

Handrails

- + Handrails shall be installed along stairways as follows:
 - Shall be continuous through the flight and where practicable, around landings and have no obstruction on or above up to a height of 600mm,
 - Shall be constructed to comply with Clause 12 of AS1428.1,
 - Installed along both sides of the stairway (giving consideration also to 1m unobstructed width)
 - Handrails must not contain any vertical sections,

60. Clause D3.4 – Exemptions

This part provides details on buildings or parts of buildings not required to be accessible under the BCA where providing access would be inappropriate because of the nature of the area or the tasks undertaken. Access need not be provided to:

- + An area where access would be inappropriate because of the particular purpose for which the area is used.



- + An area that would pose a health or safety risk for people with a disability.
- + Any path of travel providing access only to an area exempted by (a) or (b).

Comments: *This concession can be readily applied to the back of house areas, loading dock areas, kitchen and laundry within the building.*

61. Clause D3.5 – Accessible Carparking

This part provides details of the number of accessible carparking spaces required in a carpark depending on the classification of the building. In this regard the commercial and retail tenancies will require parking for people with disabilities.

Comments:

Class 9b: 1 space for every 50 spaces;

Class 3 (residential part of a school): 1 per 100 spaces.

Note: 2.5m head clearance is required above the accessible spaces.

62. Clause D3.8 – Tactile Indicators

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

Comments: *Compliance is readily achievable.*

63. Clause D3.12 – Glazing on an Accessway

This part requires the provision of a contrasting strip, chair rail, handrail or transom across all frameless or fully glazed doorways and surrounding glazing capable of being mistaken for an opening.

Comments: *Compliance is readily achievable. Design details to note requirements for full height glass.*



SECTION E – SERVICES AND EQUIPMENT

PART E1 FIRE FIGHTING EQUIPEMENT

64. Clause E1.3 - Fire hydrants

A fire hydrant system must be provided to serve a building having a total floor area greater than 500m² and where a fire brigade is available to attend a building fire, installed in accordance with the provisions of AS2419.1-2005.

The hydrant booster assembly and any external fire hydrants are required to be located greater than 10 metres from an external wall of the building, or affixed to the external wall and protected by a radiant heat shield that has an FRL of 90/90/90 located 2 metres either side and 3 metres above the outlets.

Internal hydrants within fire-isolated stairways are required to have a minimum 1m clearance from the outlet.

A required fire services pump room is required to be accessible directly from the road or open space, or from a door opening from a fire isolated exit. Internal Hydrants are to be located within each required Fire Isolated Exit

Note: Fire Hydrants located in the required exit stairs passageways must not encroach on the required 1 metre clear exit width.

Comments: *Compliance is readily achievable, noting the principle that the vehicular driveway entry from Mount Pleasant Ave is visible from the building's designated entry point.*

65. Clause E1.4 – Fire hose reels

A fire hose reel system must be provided to serve a building where one or more internal fire hydrants are installed or in a building with a floor area greater than 500m². This Clause does not apply to a class 2 or 3 building or class 4 part of a building, class 8 electricity network substation or a class 9c aged care building.

Fire Hose Reels are to be located within 4m of an exit, or located adjacent to an internal hydrant (other than one within a fire isolated exit). Where system coverage is not achieved by the above, additional FHR may be located in paths of travel to an exit.

Comments: *Applies to the class 7a and class 9b parts only. Compliance is readily achievable.*

66. Clause E1.5 – Sprinklers

A sprinkler system must be installed in a building or part of a building when required by Table E1.5 and comply with Specification E1.5.

A carpark that accommodates more than 40 vehicles is required to be provided with a sprinkler system. Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space.

Comments: *In this instance the carpark accommodates more than 40 cars (41) and requires sprinklers to be provided. Further and notwithstanding the building is less than the proponent will provide sprinklers as a voluntary measure for the building. Sprinklers are to be designed to AS2118.1-1999.*

67. Clause E1.6 – Portable fire extinguishers

Portable fire extinguishers must be provided as listed in Table E1.6 and must be selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444. Extinguishers are also required for the Class 3 corridors, a ABE type extinguisher located no more than 10m from the door of an SOU.

Comments: *Compliance is readily achievable.*

PART E2 SMOKE HAZARD MANAGEMENT

68. Clause E2.2 – General Requirements

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

Comments: *A smoke alarm system is required in accordance with Clause 4 of Spec E2.2a and Clause 3(c) is required within the Class 3 SOU's. The fire-isolated stairways associated with the Class 3 and Class 2 residential part also serve the Class 9b parts of the building. Accordingly the stairs must be provided with an automatic air pressurisation system for fire isolated exits in accordance with AS/NZS 1668.1 or an automatic smoke detection and alarm system in*



accordance with Specification E2.2a **or an automatic sprinkler system**. It is noted that the sprinkler system in the building will address the requirement above (BCA Spec E2.2a)

PART E3 LIFT INSTALLATIONS

69. Clause E3.2 – Stretcher Facility in Lifts

Stretcher facilities, complying with this clause, must be provided in lifts in at least one emergency lift as required by E3.4 or in a storey above an effective height of 12m.

A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long x 1400mm high above the floor level.

Comments: *Passenger lifts are required to have a stretcher facility as the building has an effective height exceeding 12m.*

70. Clause E3.3 – Warning against use of lifts in fire

A warning sign must be displayed near the call buttons for a passenger lift or a group of lifts on each storey of the building. The warning sign must state “Do not use lifts if there is a fire” in letting at least 8mm high or 10mm high if all capitals are used.

Comments: *Compliance readily achievable.*

71. Clause E3.6 – Passenger Lifts

In an accessible building, every passenger lift must be one of the types identified in Table E3.6a, have accessible features in accordance with Table E3.6b and not rely on a constant pressure device for its operation if the lift car is fully enclosed.

Comments: *Details for the proposed vertical passenger lifts are required confirming compliance with Table E3.6 and Specification E3.1 for all electric passenger lifts and electrohydraulic lifts installations.*

72. Clause E3.7 – Fire Service Controls

In passenger lifts designed in accordance with AS 1735 Parts 1 and 2, all lift cars serving any storey above an effective height of 12m must be provided with fire service controls.

Comments: *Compliance is required. Design certification from the lift designer is required to be provided with the application for the Construction Certificate.*

73. Clause E3.9 – Fire Service recall operation switch

Each group of lifts must be provided with one fire service control switch (required by Clause E3.7 above) that activates the fire service recall operation. This clause details the switch, the labelling, the key and operation procedures for a fire service recall operation.

Comments: *Compliance is required. Design certification is required to be provided from the lift designer with the application for a Construction Certificate.*

74. Clause E3.10 – Lift car fire service drive control switch

The lift car fire service drive control switch required by E3.7 must be activated from within the lift car. This clause details the switch, the initiation, the labelling and operation for the fire service drive control switch.

Comments: *Compliance is required. Design certification is required to be provided from the lift designer with the application for a Construction Certificate.*

75. Specification E3.1- Lift Installations

- + A lift car exposed to solar radiation directly, or indirectly by re-radiation, must have:
 - Mechanical ventilation as a rate of one air change per minute; or
 - Mechanical cooling
- + A 2 hour alternative power source for ventilation or mechanical cooling must be provided in the event of normal power loss
- + A Lift car must have emergency lighting (automatic on power failure; 20lux minimum for 2 hours)
- + Requirements for cooling of the shaft to not exceed 400 C
- + Where there is a security foyer, access may be via locked doors, subject to:



- Security doors revert to the unlocked state in the event of power failure, or fire alarm; and
- Locked foyer areas are monitored by CCTV and Intercom to a 24 hour staffed location.

+ Emergency access doors are to be provided in certain circumstances.

Comments: *Compliance is readily achievable*

PART E4 EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

76. Clause E4.2 – Emergency Lighting Requirements

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

Comments: *Compliance is assumed. Design details and statements to be provided with the Construction Certificate application.*

77. Clause E4.5 / E4.6 / E4.8 – Exit Signs

An exit sign must be clearly visible to persons approaching the exit and must be installed on, above or adjacent to each door providing egress from a building.

Comments: *Compliance is assumed. Design details and statements to be provided with the Construction Certificate application.*



SECTION F – HEALTH & AMENITY

PART F1 DAMP AND WEATHERPROOFING

78. Performance Requirement FP1.4

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

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

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

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

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

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

79. Clause F1.1 – Stormwater drainage

Stormwater drainage must comply with AS/NZ 3500.3.

Comments: Design statement to be provided with the Construction Certificate application.

80. Clause F1.4 – External Above Ground Membranes

Waterproofing membranes for external above ground use must comply with AS4654 Parts 1 & 2.

Comments: Compliance is readily achievable. Design statement is to be received from the Architect confirming the details and methods used to achieve compliance, inclusive of confirmation regarding the need for a grated drain and the threshold.

81. Clause F1.5 – Roof Coverings

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

Comments: Compliance is readily achievable.

82. Clause F1.6 – Sarking

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

Comments: Compliance is readily achievable.

83. Clause F1.7 – Waterproofing of Wet Areas

This clause requires that wet areas in Class 2 to 9 buildings must be waterproofed. It prescribes the standards to which the work must be carried on the construction of rooms containing urinals and their installation.

Comments: Compliance is readily achievable.

84. Clause F1.10 – Damp-proofing of Floors on the Ground

If the 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. Damp-proofing need not be provided if weatherproofing is not required or the floor is the base of a stair, lift or similar shaft which is adequately drained by gravitation or mechanical means.

Comments: Compliance is readily achievable.



85. Clause F1.11 – Provision of Floor Wastes

In a Class 2 or 3 building or Class 4 part of a building, the floor of each bathroom and laundry located above a sole-occupancy unit or public space must be graded to permit drainage to a floor waste.

Comments: Compliance is readily achievable.

86. Clause F1.13 – Glazed Assemblies

Glazed assemblies in an external wall must comply with AS2047 requirements for resistance to water penetration for windows, sliding doors with a frame, adjustable louvres, shop fronts and windows with one piece framing

Comments: Compliance is readily achievable.

PART F2 SANITARY AND OTHER FACILITIES

87. Clause F2.1 – Facilities in Residential Buildings

Each resident within a building or group of buildings must be provided with **a bath or shower; and a closet pan and washbasin for each 10 residents** for whom private facilities are not provided, except that if one urinal is provided for each 25 males up to 50 and one additional urinal for each additional 50 males or part thereof, one closet pan for each 12 males may be provided.

Further, a closet pan and washbasin in a room at or near ground level has been provided for employees use.

Comments: There are 218 students in the building within the Class 3 boarding House areas. There are also three (3) Class 2 Apartments that will be used by the staff. The students require a minimum of 22 WCs and showers (38 and 40 provided), of which compliance has been exceeded.

88. Clause F2.2 / F2.3 – Calculation of Number of Occupants & Facilities

This clause sets out the requirements for the calculation of the number of occupants and the number of sanitary facilities required to be installed in Class 2 to 9 buildings.

Sanitary facilities are required to be provided for the employees of the commercial tenancies. If not more than 10 persons are employed a single unisex facility may be provided, the facility is required to comply as an accessible sanitary facility with AS 1428.1-2009.

Comments[SM10]:

The students require a minimum of 22 WCs and showers (38 and 40 provided), of which compliance has been exceeded.

There are also sufficient facilities for the Class 9b parts of the building for use by dining, reception.

89. Clause F2.4 – Accessible Sanitary Facilities

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

Comments: Compliance is readily achievable. A series of accessible facilities have been provided throughout the building.

90. Clause F2.5 – Construction of Sanitary Compartments

Other than in an early childhood centre sanitary compartments must have doors and partitions that separate adjacent compartments and extend –

- + from floor level to the ceiling in the case of a unisex facility; or
- + a height of not less than 1.5m above the floor if primary school children are the principal users; or
- + 1.8 above the floor in all other cases.

The door to a fully enclosed sanitary compartment must open outwards; or slide: or be readily removable from the outside of the sanitary compartment, unless there is a clear space of at least 1.2m, measured in accordance with Figure F2.5 between the closet pan within the sanitary compartment and the doorway.

Comments: Compliance readily achievable.



PART F3 ROOM HEIGHTS

91. Clause F3.1 Height of Rooms and other spaces

The ceiling heights in Class 2 to 9 buildings must not be less than required in sub-clauses (a) to (f) of this clause.

The ceiling heights are prescribed and should be checked for all classes and parts during assessment or the design process.

The ceiling minimum heights for a Class 2 or 3 building are as follows:

- + Kitchen, laundry or the like – 2.1m;
- + Corridor, passageway or the like – 2.1m
- + Habitable rooms excluding the kitchen – 2.4m.

The ceiling minimum heights for a Class 5, 6, 7 building are as follows:

- + Corridor or passage – 2.1m;
- + Bathroom, storeroom, etc – 2.1m
- + Remainder of areas – 2.4m.

Comments: *The floor to ceiling heights in the Class 3 rooms must not be less than 2.4 metres in habitable rooms and 2.1 metres in kitchens, laundries, and bathrooms.*

In addition, the floor to ceiling heights within the Class 9b parts must be not less than 2.4m, with the exception of the dining hall where >100 occupants will be located – 2.7m minimum height.

In relation to the carpark a minimum 2.2m height is required to address circulation paths for vehicles (AS2890.1) and 2.5m clearance above accessible car spaces.

PART F4 LIGHT AND VENTILATION

92. Clause F4.1 – Provision of natural Light

Natural lighting must be provided in:

- + Class 2 buildings and Class 4 parts of buildings – to all habitable rooms.
- + **Class 3 buildings** – all bedrooms and dormitories.
- + Class 9a and 9c buildings – all rooms used for sleeping purposes.
- + Class 9b buildings – to all general purpose classrooms in primary or secondary schools and all playrooms and the like for the use of children in an early childhood centre.

Comments: *All bedrooms are required to have natural light.*

93. Clause F4.2 - Methods & Extent of Natural Lighting

This clause sets out the requirement that natural light must be provided by windows and the size and location of such windows (i.e. the glazed area of the window is to be no less than 10% of the floor area of the room). Natural light can also be provided by the use of rooflights.

Comments: *Compliance is readily achievable. [SM11]*

94. Clause F4.3 – Natural light borrowed Light from adjoining room

This clause sets out the requirement for natural light borrowed from an adjoining room within a class 2 or class 3 building or a class 4 building part.

Note: diagram in the Guide to the BCA **Figure F4.3** showing a method of determining areas of openings for borrowed light (See appendix).

Comments: *Not applicable to this design. All rooms are achieving direct natural light from windows in the external wall.*

95. Clause F4.4 – Artificial Lighting

Artificial lighting is required where it is necessary to minimise the hazard to occupants during an emergency evacuation. This Clause sets out the places where artificial lighting is always required in all classes of buildings and the standard to which it must be installed.

Comments: *Compliance is assumed.*



96. Clause F4.5 – Ventilation of Rooms

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

Comments: Details are to be provided from the mechanical design consultant for all ventilation to the building. See comments in previous sections relating to protection of windows in external walls and the need for ventilation.

97. Clause F4.8 – Restriction on Position of Water Closets and Urinals

A room containing a water closet pan or urinal must not open directly into a kitchen or pantry, public dining room or restaurant, a dormitory in a Class 3 building, a room used for public assembly (which is not an early childhood centre, primary school or open spectator stand) or a workplace normally occupied by more than 1 person.

Comments: Architectural documentation shows compliance is achieved.

98. Clause F4.9 – Airlocks

If a room containing a closet pan or urinal is prohibited under F4.8 from opening directly into another room then the provisions of sub-clauses (a) & (b) apply relating to the requirements of airlocks and mechanical ventilation standards.

Comments: Compliance readily achievable.

99. Clause F4.11 – Carparks

Every storey of a carpark except an open-deck carpark must have-

- + A system of ventilation complying with AS 1668.2; or
- + An adequate system of permanent natural ventilation.

Comments: Design certification from the Mechanical Engineer for the mechanical ventilation system is to be provided with the application for the Construction Certificate.

PART F5 SOUND TRANSMISSION AND INSULATION

100. Clause F5.3 – Determination of Impact Sound Insulation Ratings

The walls within the Class 3 residential parts of the building that are required to have an impact sound insulation rating must be of discontinuous construction.

Note: Discontinuous construction means a wall having a minimum 20mm cavity between 2 separate leaves, and for masonry, wall ties are of a resilient type. For all other construction there is no mechanical link between leaves except at the periphery.

Comments: The walls within the Class 3 part of the building that are required to have an impact sound insulation rating must be of discontinuous construction.

The assessment and compliance with the requirements of Part F5 of the BCA is to be undertaken by an Acoustic Consultant.

Report and certification to be provided with the application for a Construction Certificate confirming compliance with the requirements of Part F5.

101. Clause F5.4 – Sound Insulation Rating of Floors

The sound rating of floors in a Class 2 or 3 building must be calculated in accordance with the requirements of sub-clause (a) and the floors in a Class 9c aged care building must be calculated in accordance with sub-clause (b). The deemed-to-satisfy construction requirements are set out in Specification F5.2. Table 3 of the Specification prescribes Acceptable Forms of Construction for Floors.

Comments: The assessment and compliance with the requirements of Part F5 of the BCA is to be undertaken by an Acoustic Consultant.

Report and certification to be provided with the application for a Construction Certificate confirming compliance with the requirements of Part F5.

102. Clause F5.5 – Sound Insulation Rating of Walls

A wall separating a sole occupancy unit from another part of the building must have an airborne sound insulation rating of not less than 50 and be provided with discontinuous construction if it separates a bathroom, sanitary compartment, laundry, kitchen in another sole occupancy unit or a plant room or lift shaft.



A door that separates a sole occupancy unit from a public corridor must have a weighted sound reduction index of not less than 30.

Comments: The assessment and compliance with the requirements of Part F5 of the BCA is to be undertaken by an Acoustic Consultant.

Report and certification to be provided with the application for a Construction Certificate confirming compliance with the requirements of Part F5.

103. Clause F5.6 – Sound Insulation Rating of Services

Where a duct, soil, waste or water supply pipe passes through more than one sole occupancy unit, the duct or pipe must be separated from the rooms of a sole occupancy unit by construction having an airborne sound insulation rating of not less than 40 if the adjoining room is habitable or 25 if it is a kitchen or non-habitable room.

Comments: The assessment and compliance with the requirements of Part F5 of the BCA is to be undertaken by an Acoustic Consultant.

104. Clause F5.7 – Sound Isolation of Pumps

A flexible coupling must be used at the point of connection between the service pipes in a building and any circulating or other pump.

Comments: The assessment and compliance with the requirements of Part F5 of the BCA is to be undertaken by an Acoustic Consultant.

SECTION G – ANCILLARY PROVISIONS

PART G1 MINOR STRUCTURES AND COMPONENTS

105. G1.2 – Refrigerated Chambers, Strong Rooms and Vaults

A refrigerated or cooling chamber which is of sufficient size for a person to enter must have:

- + A door which is capable of being opened by hand from inside without a key;
- + Internal lighting controlled only by a switch which is located adjacent to the entrance doorway inside the chamber;
- + An indicator lamp positioned outside the chamber which is illuminated when interior lights required by above are switched on and
- + An alarm that is located outside but controllable only from within the chamber; and able to achieve 90dB(A) measured 3m away.

106. NSW Clause G1.101 – Provision for Cleaning of Windows

A building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

A building satisfies this requirement where the windows can be cleaned wholly from within the building; or provision is made for the cleaning of the windows by a method complying with the occupational Health and Safety Act 2000 and regulations made under that Act.

Comments: The applicant is to understand their obligations in this regard.



SECTION J – ENERGY EFFICIENCY

Part J1 Building Fabric

107. Part J1 – Deemed-to-Satisfy Provisions

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

Comments: *Energy efficiency design measures will be implemented into the 'new' building design to satisfy the requirements under BCA Parts J1, J2, J3, J5, J6, J7 and J8 for Climate Zone 5 as follows;*

- + building fabric (insulation)
- + external glazing
- + building sealing to doors, exhaust vents and windows
- + efficiency of the running of air conditioning systems and mechanical ventilation systems with respect to insulation of ductwork, timer switches, etc
- + performance of glazing
- + artificial lighting & power controls (interior and exterior lighting)
- + hot water systems
- + access and maintenance of energy efficiency systems

It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA[SM12].

108. Part J2 – Glazing

Glazing within the external building envelope will be required to be assessed/designed to achieve compliance with Clauses J2.0 to J2.5, including the Tables therein, having regard to the maximum aggregate air-conditioning energy attributable to each façade of the proposed building. A calculation demonstrating that the proposed design of the building complies with the requirements of Part J2 is required to be provided in this regard.

Comments[SM13]: *Compliance is readily achievable. Details are to be provided with the Construction Certificate documentation including the glazing calculator. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.*

109. Part J3 – Building Sealing

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

Comments: *Compliance is readily achievable. Details are to be provided with the Construction Certificate documentation. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.*

110. Part J4 – Air Movement

Details and/or design certification which confirm that air movement within the proposed building achieves compliance with the relevant requirements of Clauses J4.0 to J4.4 and the Table therein will be required to be provided from the mechanical engineer.

Comments: *Compliance is readily achievable. Details are to be provided with the Construction Certificate documentation. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.*

111. Part J5 – Air-Conditioning & Ventilation Systems

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

Comments: *Compliance is readily achievable. Details are to be provided with the Construction Certificate documentation. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.*



112.Part J6 – Artificial Lighting & Power

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

Comments: Compliance is readily achievable. Details are to be provided with the construction certificate documentation. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.

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

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

Comments: Compliance is readily achievable. Details are to be provided with the construction certificate documentation. It is recommended that an accredited ESD consultant be engaged to provide a report confirming compliance with the requirements of this part of the BCA.

114.Part J8 – Access For Maintenance & Facilities For Monitoring

See NSW Subsection J8 for access to maintenance.

Access must be provided to all plant, equipment and components that require maintenance in accordance with Part 2.

Comments: Details are to be provided from the design consultants for their respective disciplines for proposed new glazing, building fabric, ventilation, electrical and hydraulic systems that compliance with the requirements of Section J has been achieved.



E. CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed residential boarding house development and the building demolition works to the Mary Ward block at **Loreto Normanhurst School** against the Deemed-to-Satisfy Provisions of the BCA 2016 Amd 1. Arising from the review, and subject to consideration of the matters raised in this report, the proposed development can readily achieve compliance with the relevant provisions of the BCA with any further design changes being of a nature that will not result in the need to modify the development consent.



APPENDIX 1

The following fire safety measures are required for the **Class 3, 7a & 9b** building.

SCHEDULE

| Statutory Fire Safety Measure | Design / Installation Standard |
|--|--|
| Access Panels, Doors & Hoppers | BCA Clause C3.13 & AS 1530.4 – 2014 and Manufacturer's specifications |
| Automatic Smoke Detection and Alarm System | BCA Spec. E2.2a & AS 1670.1 – 2015 |
| Automatic Fire Suppression System | AS2118.1-1999 |
| Building Occupant Warning System activated by the Sprinkler System | Clause 3.22 of AS 1670.1 – 2015 |
| Emergency Lighting | BCA Clause E4.4 & AS 2293.1 – 2005 |
| Exit Signs | BCA Clauses E4.5, E4.6 & E4.8; and AS 2293.1 – 2005 |
| Fire Blankets | AS 3504 – 1995 & AS2444 – 2001 |
| Fire Doors | BCA Clause C2.12, C2.13, C3.2, C3.4, C3.5 & C3.11; and AS 1905.1 – 2015 and manufacturer's specification |
| Fire Seals | BCA Clause C3.15, AS 1530.4 & AS 4072.1 – 2014 and manufacturer's specification |
| Mechanical Air Handling Systems (automatic shutdown in assembly parts) | BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012 |
| Paths of Travel | EP&A Regulation Clause 186 |
| Portable Fire Extinguishers | BCA Clause E1.6 & AS 2444 – 2001 |
| Warning & Operational Signs | Section 183 of the EP&A Regulation 2000, AS 1905.1 – 2015, BCA Clause D3.6, E3.3 |
| <i>Fire engineered Alternative Solutions</i> | <i>(TBA)</i> |

Notes:

- + *The measures included and the standards of performances nominated above may vary as a result of any proposed fire engineered alternative solutions.*
- + *The provision of sprinklers is a voluntary fire safety measure*



APPENDIX 2

TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

| Building element | Class of building — FRL: (in minutes) | | | |
|---|---|-------------|-------------|-------------|
| | <i>Structural adequacy/Integrity/Insulation</i> | | | |
| | 2, 3 or 4 part | 5, 7a or 9 | 6 | 7b or 8 |
| EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is— | | | | |
| For <i>loadbearing</i> parts— | | | | |
| less than 1.5 m | 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
| 1.5 to less than 3 m | 90/ 60/ 60 | 120/ 90/ 90 | 180/180/120 | 240/240/180 |
| 3 m or more | 90/ 60/ 30 | 120/ 60/ 30 | 180/120/ 90 | 240/180/ 90 |
| For non- <i>loadbearing</i> parts— | | | | |
| less than 1.5 m | —/ 90/ 90 | —/120/120 | —/180/180 | —/240/240 |
| 1.5 to less than 3 m | —/ 60/ 60 | —/ 90/ 90 | —/180/120 | —/240/180 |
| 3 m or more | —/—/— | —/—/— | —/—/— | —/—/— |
| EXTERNAL COLUMN not incorporated in an <i>external wall</i> — | | | | |
| For <i>loadbearing</i> columns— | | | | |
| | 90/—/— | 120/—/— | 180/—/— | 240/—/— |
| For non- <i>loadbearing</i> columns— | | | | |
| | —/—/— | —/—/— | —/—/— | —/—/— |
| COMMON WALLS and FIRE WALLS— | 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
| INTERNAL WALLS— | | | | |
| <i>Fire-resisting</i> lift and stair <i>shafts</i> — | | | | |
| <i>Loadbearing</i> | 90/ 90/ 90 | 120/120/120 | 180/120/120 | 240/120/120 |
| Non- <i>loadbearing</i> | —/ 90/ 90 | —/120/120 | —/120/120 | —/120/120 |
| Bounding <i>public corridors</i> , public lobbies and the like— | | | | |
| <i>Loadbearing</i> | 90/ 90/ 90 | 120/—/— | 180/—/— | 240/—/— |
| Non- <i>loadbearing</i> | —/ 60/ 60 | —/—/— | —/—/— | —/—/— |
| Between or bounding <i>sole-occupancy units</i> — | | | | |
| <i>Loadbearing</i> | 90/ 90/ 90 | 120/—/— | 180/—/— | 240/—/— |
| Non- <i>loadbearing</i> | —/ 60/ 60 | —/—/— | —/—/— | —/—/— |
| Ventilating, pipe, garbage, and like <i>shafts</i> not used for the discharge of hot products of combustion— | | | | |
| <i>Loadbearing</i> | 90/ 90/ 90 | 120/ 90/ 90 | 180/120/120 | 240/120/120 |
| Non- <i>loadbearing</i> | —/ 90/ 90 | —/ 90/ 90 | —/120/120 | —/120/120 |
| OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS— | | | | |
| | 90/—/— | 120/—/— | 180/—/— | 240/—/— |
| FLOORS | 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
| ROOFS | 90/ 60/ 30 | 120/ 60/ 30 | 180/ 60/ 30 | 240/ 90/ 60 |



APPENDIX 3

The following comments apply to the proposed demolition works to the buildings/structures that are located between the Mary Ward building and the existing Boarding House dining areas

- + The buildings are considered to be Class 3 (accommodation part of a school); Class 5 (administrative); Class 9b (assembly areas).
- + All external walls of the existing buildings to remain are to be 'made good' for weatherproofing and also structural adequacy. It is recommended that a structural engineer be involved in the design strategy of the buildings to be demolished to ensure the existing buildings to remain are provided with the required integrity and adequacy for its intended use in accordance with BCA Part B1.
- + The doors associated with the ultimate external wall of the Mary Ward building are to swing outward, in the direction of egress.
- + Temporary egress arrangements via the existing doors in the Mary Ward building (north east corner) are to be instituted:
 - o Lever latch handles to be provided;
 - o Exit signs to be provided in the corridor and also above the door;
 - o Inward swinging door to be provided with a floor mounted hold open device.
- + Electrical distribution boards are to be relocated where necessary as part of the demolition works.
- + Fire hose reel in the existing foyer is to be relocated (it can remain external), so as to ensure coverage is provided during construction and also at completion of demolition.
- + Demolition boundary hoardings are to be erected to ensure adequate paths of travel are retained from the existing and temporary exits.