BLACKETT MAGUIRE+ GOLDSMITH

BCA ASSESSMENT REPORT – SCHEMATIC DESIGN

PROJECT: Goulburn Hospital & Health Services Redevelopment

PREPARED FOR: TSA Management

TSA MANAGEMENT

Revision 1

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REPORT STATUS				
DATE	**REVISION**	**STATUS**	**AUTHOR**	**REVIEWED**
24.07.17	0	Draft Schematic Report	AR	DB
27.09.17	1	Final Schematic Report	AR	DB

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1.0 INTRODUCTION

1.1 PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd have been commissioned by TSA Management to undertake an assessment of the Goulburn Hospital and Health Services Redevelopment against the relevant provisions of the Building Code of Australia 2016 (BCA).

The Goulburn Hospital and Hospital Services project scope is described as follows:

- A new 4-storey clinical building with pedestrian links to existing building comprising:
  - Lower Ground Level
    - Emergency Department
    - Medical Imaging
    - Plant
  - Ground level
    - Maternity and Paediatrics
    - SARU
  - Level 1
    - IPU MED/SURG
    - Perioperative
  - Level 2
    - ICU
    - IPU and Palliative
  - Level 3
    - Plant
- Demolition of various existing buildings and construction of new carparks to the North and West.
- Extension of community health and community mental health building
- Refurbishment of existing SARU, Physio, ED, ICU.

It is understood VE options include;

1. Medical Records and Patient Flow to be located on LGF in shell east of ED.
2. TECS to be located on LGF in shell east of Imaging.
3. The western visitor lift car and shaft to be omitted - minor adjustment of vertical risers.
4. The new link (running east west from Acute Building to New Ambulatory Entry) and sandwiched between between the existing ED and Theater buildings to be omitted and replaced with a shorter link between the new Acute Building and the Eastern face of the existing Theater building on Levels 1 and GF.
5. Pharmacy Scope - VE option requires replanning to limit structural scpe.
6. SARU refurbishment - VE option requires showing curtains to divide rooms instead of Gyprock partitions as shown in SDR.
7. Education Building to be demolished, car park to be redesigned

The aim of this report is to:

- Undertake an assessment of the proposed development against the deemed-to-satisfy provisions of the BCA;
- Identify matters that require plan amendments in order to achieve compliance with the BCA;
- Identify matters that are to be required to be addressed by Performance Solutions;
- Enable the certifying authority to satisfy its statutory obligations under Clause 143(1)(3) of the Environmental Planning and Assessment Regulation, 2000
- Enable the certifying authority to satisfy its statutory obligations under Clause 145 of the Environmental Planning and Assessment Regulation, 2000.
- Enable the certifying authority to satisfy its statutory obligations under Clause 109R of the Environmental Planning and Assessment Act, 1979.

1.2 PROJECT TEAM

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

- Aaron Redfern – Report Preparation (Building Surveyor) | A1 Accredited Certifier
- David Blackett– Project PCA/Peer Review (Director) | A1 Accredited Certifier

1.3 REFERENCED DOCUMENTATION

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

- Building Code of Australia 2016 (BCA).
- The Guide to the Building Code of Australia 2016 (BCA).
- Architectural Plans prepared by Billard Leece Partnership Pty Ltd numbered:

Drawing No.	Revision	Date	Drawing No.	Revision	Date
AA00-0001	D	21.07.2017	AA00-0101	B	21.07.2017
AA01-0001	D	21.07.2017	AA01-0101	D	21.07.2017
AA01-0201	D	21.07.2017	AA02-0001	C	21.07.2017
AA02-0002	C	21.07.2017	AA02-1001	B	21.07.2017
AA02-1002	B	21.07.2017	AA02-1003	B	21.07.2017
AA02-2001	B	21.07.2017	AA02-2002	B	21.07.2017

AA02-2101	B	21.07.2017	AA02-2102	B	21.07.2017
AA02-2201	B	21.07.2017	AA02-2202	B	21.07.2017
AA02-2203	B	21.07.2017	AA03-0001	B	21.07.2017
AA03-0101	B	21.07.2017	AA03-0201	B	21.07.2017
AA03-0301	B	21.07.2017	AA03-LG01	B	21.07.2017
AA04-0001	B	21.07.2017	AA05-0001	B	21.07.2017
AA06-0001	C	21.07.2017	AA06-0101	C	21.07.2017
AA06-0201	C	21.07.2017	AA06-0301	C	21.07.2017
AA06-0401	C	21.07.2017	AA06-LG01	C	21.07.2017
AA07-0001	C	21.07.2017	AA08-0001	C	21.07.2017
AA09-0001	C	21.07.2017	AA09-0101	C	21.07.2017
AA09-0201	C	21.07.2017	AA09-LG01	D	21.07.2017
AA10-0001	H	26.09.2017	AA10-0002	D	26.09.2017
AA10-0101	H	26.09.2017	AA10-0201	H	26.09.2017
AA10-0301	G	26.09.2017	AA10-401	E	26.09.2017
AA10-LG01	I	26.09.2017	AA10-LG02	D	26.09.2017
AA10-LG03	D	26.09.2017	AA17-0001	D	21.07.2017
AA17-0101	D	21.07.2017	AA17-0201	D	21.07.2017
AA17-LG01	D	21.07.2017	AA18-0001	D	21.07.2017
AA18-0101	D	21.07.2017	AA20-0001	D	21.07.2017
AA20-0101	D	21.07.2017	AA20-0201	D	21.07.2017
AA20-0301	D	21.07.2017	AA30-0001	D	21.07.2017
AA30-0101	D	21.07.2017	AA30-0201	D	21.07.2017
AA30-0301	F	21.07.2017	AA30-0302	F	21.07.2017
AA30-0401	D	21.07.2017	AA30-0501	C	21.07.2017
AA30-0701	D	21.07.2017	AA30-0801	B	21.07.2017
AA52-1001	E	21.07.2017	AA52-1101	D	21.07.2017
AA52-1201	C	21.07.2017	AA52-1401	B	21.07.2017
AA95-0001	A	21.07.2017	AA96-0101	A	21.07.2017
AA96-0201	A	21.07.2017	AA96-0301	A	21.07.2017
AA96-0401	A	21.07.2017	AA97-0001	A	21.07.2017
AA97-0002	A	21.07.2017	AA98-0001	A	21.07.2017
AA98-0002	A	21.07.2017	AA98-0003	A	21.07.2017
AA99-0001	A	21.07.2017			

1.4 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.

1.5 ASSESSMENT METHODOLOGY

The BCA assessment was carried out in tabulated form in APPENDIX 1 below. The documents were assessed against the BCA 2016 requirements and the findings were detailed under the 'Comment' column.

1.6 LIMITATIONS AND EXCLUSIONS

The limitations and exclusions of this report are as follows:

+ No assessment has been undertaken with respect to the Disability Discrimination Act 1992 (DDA). The building owner needs be satisfied that their obligations under the DDA have been addressed.

  Please note that whilst the BCA specifies a minimum standard of compliance with AS1428 (Parts 1-3) and Part D3 of the BCA for access and facilities for people with disabilities, compliance with such requirements may not necessarily preclude the possibility of a future complaint made under the DDA 1992. The DDA is a complaint based legislation and is presently not identified by the State Building Codes and Regulations. In this regard the building owner should be satisfied that their obligations under the DDA have been addressed.

+ BM+G has not undertaken an assessment of any Alternative Solution Reports at the time of the preparation of this report.

+ The Report does not address matters in relation to the following Local Government Act and Regulations:

  i. Work Health and Safety Act and Regulations.

  ii. Work Cover Authority requirements.

  iii. Water, drainage, gas, telecommunications and electricity supply authority requirements.

  iv. Disability Discrimination Act 1992.

+ Blackett Maguire + Goldsmith Pty Ltd cannot guarantee acceptance of this report by Local Council, Fire & Rescue NSW or other approval authorities.

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1.7 REPORT TERMINOLOGY

Building Code of Australia - Document published on behalf of the Australian Building Codes Board. The 1BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in NSW under the provisions of the Environmental Planning & Assessment Act & Regulation.

Climatic Zone – Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

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 (DTS) Provisions of the BCA – Means the prescriptive provisions of the BCA which are deemed to satisfy the performance requirements.

Effective Height – The vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and 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).

Exit – Any, or any combination of the following if they provide egress to a road or open space;

+ An internal or external stairway.
+ A ramp.
+ A fire-isolated passageway.
+ A doorway opening to a road or open space.

Fire Compartment – The total space of the building; or when referred to in

- The Performance Requirements – any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or
- The Deemed-to-Satisfy Provisions – any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that required for a fire wall for that type of construction and where all openings in the separating construction are protected in accordance with the Deemed-to-Satisfy Provisions of the relevant part.

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

National Construction Code Series (NCC) – The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupation Certificate **(OC)** – Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open Space - Means 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 Deemed-to-Satisfy 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 Deemed-to-Satisfy Provisions; or

(c) a combination of (a) and (b).

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

Rise in Storeys – The greatest number of storeys calculated in accordance with C1.2.

Sole Occupancy Unit – means 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 can include a dwelling and/or office suite

Treatment area - means an area within a patient care area such as an operating theatre and rooms used for recovery, minor procedures, resuscitation, intensive care and coronary care from which a patient may not be readily moved.

Ward Area - means that part of a patient care area for resident patients and may contain areas for accommodation, sleeping, associated living and nursing facilities.

2.0 BUILDING CHARACTERISTICS

2.1 PROPOSED DEVELOPMENT

The proposed development consists of a new acute building and refurbishments at Goulburn Base Hospital.

The building is classified as follows:

BCA CLASSIFICATION:	5,9a
RISE IN STOREYS:	Four (4) *New Acute Building*
STOREYS CONTAINED:	Four (4) *New Acute Building*
TYPE OF CONSTRUCTION:	Type A Construction
IMPORTANCE LEVEL (STRUCTURAL AND SERVICES):	4
SPRINKLER PROTECTED THROUGHOUT:	Yes – New build to be sprinkler protected, existing buildings are not sprinkler protected. *Note: Refer to Clause E1.5 for further information.*
EFFECTIVE HEIGHT:	Less than 25m
FLOOR AREA:	TBC by Architect.
MAX. FIRE COMPARTMENT SIZE:	5,000m^2 & 30,000m^2. *Maximum fire compartment size for patient care area is 2,000m^2.*
CLIMATE ZONE:	Zone 7

2.2 FLOOR AREA LIMITATIONS

Maximum size of fire compartment / atria is:

Classification		Type A	Type B	Type C
6, 7, 8 or 9a	Max. floor area	5,000m^2	3,500m^2	2,000m^2
	Max. volume	30,000m^3	21,000m^3	21,000m^3
5, 9b or 9c	Max. floor area	8,000m^2	5,500m^2	3,000m^2
	Max. volume	48,000m^3	33,000m^3	18,000m^3

Note: Maximum fire compartment size for patient care area is 2,000m^2.

3.0 SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance issues identified under the clause-by-clause assessment in APPENDIX 1 of this report that will be addressed prior to the BCA Certification for the project.

3.1 MATTERS REQUIRING REDESIGN OR ADDITIONAL INFORMATION AT CC STAGE:

BCA (DtS) Clause		Description
1.	C2.2	Architect to confirm the volume of the new Acute building, in particular with the central void connecting all 4 storeys.
2.	C2.5	In regards to refurbished Oncology unit, architect to confirm this building is <1,000m. The Oncology part is to be fire separated from the remainder of the building by construction having an FRL of 120/120/120. The new medical records room must be fire separated by construction having FRL of not less than 60/60/60
3.	C2.12	Details of fire separation with a minimum FRL of 120/120/120 to any of the applicable areas of new work – e.g. pumproom and stair pressurisation equipment, to be clearly shown at 109R Crown Certificate stage. Particular attention should also be drawn to comms rooms if they have UPS or battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.
4.	Spec C1.1	Further specific details are required on the use and extent of Aluminium Composite Panels. Further information is required regarding the structure of the pedestrian link bridge on level 1 from the new acute building to existing hospital building. The bridge is required to be constructed with FRL of 2hrs or addressed in the fire engineered performance solution.
5.	D1.2	The central Plant room on Level 3 requires access to the fire stairs. An additional exit to open space is required to southern side lower ground floor medical imaging. An additional doorway is required from the MRI scanning room on lower ground, to provide access to point of choice. Confirmation required if egress for pathology is provided by stairway. The new link is “enclosing” the existing pathology building therefore egress from this building must be considered.
6.	D1.7	The discharge of the Northern fire stair shall comply with D1.7(b)(ii) i 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. Where passing by external of the building is required, the external wall must have FRL not less than 60/60/60.
7.	D2.22	Re-entry into fire stairs required for Class 9a buildings as per Clause D2.22. Design team to confirm which option under this clause is to be taken.
8.	E1.3	The location of the Booster shall be >10m from electrical substation and any gas storage or meters.
9.	E1.5	Any area where sprinklers are not proposed to be provided need to be advised. If sprinklers are to be omitted from electrical cupboards and rooms, 2hr fire separation is required. Further information is required to where sprinkler valves are located. Recommend sprinkler protection to pedestrian links, with capacity for future expansion and installation to all parts of existing building. It is understood refurbished Oncology unit is to to be sprinkler protected as this is new patient care use. 2 hour fire separation is required between sprinkler and non sprinklered parts. Consideration of sprinkler protection to Existing SARU *(Currently not sprinkler protected)*

BCA (DtS) Clause		Description
10.	**E1.8**	It is noted that the fire control centre is proposed to be located directly adjacent to the front of house. The main FIP should be located at the new main entrance. The main FIP shall be interfaced with existing sub FIP's throughout existing hospital buildings. Confirmation required from fire service consultant this can be achieved. The detailed design needs to ensure that the centre complies with Clauses 2-5 of Spec E1.8. In particular, the centre must have a doorway which opens directly to open space and does not have a change on level of >300mm.
11.	**F2.3**	The proposed population of the staff, patients and public is required to be provided to determine the minimum number of sanitary facilities to be provided.

3.2 MATTERS REQUIRING FIRE SAFETY ENGINEERED PERFORMANCE SOLUTIONS:

BCA (DtS) Clause		Description
1.	**C1.1**	Fire rating of steel structure of the link walkway between new acute building and existing buildings on Level 1.
2.	**C2.5**	In regards to the new acute building; + Smoke compartment size are to be addressed through fire engineered performance solution. Max. smoke compartment size is 560m². + We recommend providing wall that are noted as smoke wall to be upgraded to 2hr fire and smoke walls. This assists with horizontal evacuation and travel distances. + The fire compartment on ground floor SARU is to be divided further, no smoke compartment to exceed greater than approx. 560m².
3.	**C3.2**	The following areas have windows in external walls that are exposed with 6m of existing buildings; + New acute building and new community mental health extension.
4.	**C3.3**	The following protection of openings between different compartments will be rationalised in the fire engineering report
5.	**C3.15**	The method of fire stopping medical gases passing through fire rated walls and floors are to be addressed in the fire engineering report.
6.	**Spec C3.4, D2.20**	Smoke doors and fire doors in horizontal exit will not swing in both directions and is to be addressed in the fire engineering report.
7.	**D1.3, D1.12**	The central non fire isolated stair connects 3 levels (non patient care) and shall be addressed in the fire engineering report.
8.	**D1.4**	The following exit travel distances shall be addressed in the fire engineering report. *Note: These distance may be subject to change as design develops further.* <u>New acute building - Lower ground</u> + 15m to point of choice from security staff office in ED department + 15m to point of choice from staff room in medical imagining. <u>New acute building – Ground floor</u> + 25m Point of choice ground floor main reception desk. + 15m to point of choice from outdoor terrace on North East corner of maternity. <u>Existing refurbished buildings- Pathology, Pharmacy, Kiosk (non patient care)</u> + 25m to point of choice and 50m to nearest exit. <u>New acute building – Level 1</u> + Point of choice up to 13m in IPU + Point of choice up to 14m in patient Bay recovery in Perioperative. <u>New acute building – Level 2</u> + A re-design is required of the south-western room – travel distance to point of choice is currently 15m which cannot be justified in the fire engineered performance solution.

BCA (DtS) Clause		Description
9.	**D1.5**	The following exit travel distances between alternative shall be addressed in the fire engineering report. Existing refurbished buildings- Pathology, Pharmacy, Kiosk (non patient care) + 70m between exits. Community Health building (non patient care + 75m from courtyard of community health building.
10.	**D1.7**	Level 3 plant rooms open directly into fire stair without an airlock, or lobby.
11.	**D1.1**	Discharge of horizontal exits into fire compartments without an egress stairway or direct to open space occurs at level 1 and 2. The required clear space on the egress side of the fire wall will also be assessed in the fire engineering report.
12.	**D2.19**	Sliding doors are proposed in a patient care area of the building – ED bays, ICU bays CCU bays and CV bays and shall be addressed in the fire engineering report.
13.	**E1.3**	Fire Hydrant Booster proposed to be located from Faithful St, which is not within sight of the main entry and adjacent to main vehicle entry.
14.	**E1.5**	To not provide fire separation between sprinkler protected corridors and other existing non sprinkler protected areas on ground floor and level 1. We acknowledge this as a compliance issue in relation to clause 3.1.2.1 of AS 2118.1-1999 which notes exposure hazards as unprotected roofs from non-sprinkler protected parts of a building that are within 10m of a sprinkler protected part of a building are required to be separated.

4.0 CONCLUSION

This report contains an assessment of the referenced architectural documentation for the proposed Goulburn Hospital and Hospital Services Redevelopment against the deemed-to-satisfy provisions of the Building Code of Australia 2016 (BCA).

Arising from the assessment, key compliance issues have been identified that require further resolution, either by way of fire engineered Performance Solutions or plan amendments during further design development.

Notwithstanding the above, it is considered that the proposed development can readily achieve compliance with the BCA subject to resolution of the matters identified under Section 9 & APPENDIX 1 of this report.

APPENDIX 1 - BCA ASSESSMENT

KEY:

+ **Complies:**	The referenced plans show compliance with this clause
+ **Compliance Readily Achievable:**	The referenced plans do not show sufficient information to establish compliance with this clause. Design certification, should be submitted with the application for the 109R Crown Certificate stage.
+ **Further Information Required:**	The referenced plans do not show sufficient information to establish compliance with this clause. Further details, should be submitted with the application for the 109R Crown Certificate stage.
+ **Performance Solution:**	The referenced plans do not comply with this clause and an Performance Solution is required/proposed to demonstrate compliance with the Performance Requirements
+ **Noted:**	Provisions contained within this BCA clause are provided for guidance, or are to be read in conjunction with other BCA clauses
+ **Not applicable/ Not critical information:**	This clause is not applicable or not critical to the proposed development. These clauses have been removed from the assessment table below.
+ **Does Not Comply**	The proposal does not comply with this clause and redesign is required.

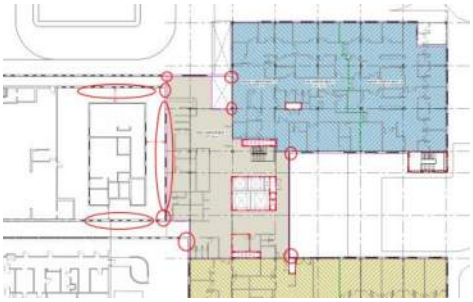
CLAUSE	REFERENCE	COMMENT
SECTION B	**STRUCTURE**	
Part B1	***Structural Provisions***	
B1.2 Determination of individual actions	Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1 in relation to the new structural elements of the building.	**Compliance Readily Achievable** Design Statement is to be provided confirming that the design achieves compliance with the following is required at the time of the Construction Certificate application, 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 2047 – 1999, Windows in buildings. AS 1288 – 2006, Glass in buildings
B1.4 Determination of structural resistance of materials	Materials & Forms of Construction	**Compliance Readily Achievable:** Detail and design certification to be provided at the 109R Crown Certificate stage.

CLAUSE	REFERENCE	COMMENT
SECTION C	**FIRE RESISTANCE**	
Part C1	***Fire Resistance and Stability***	
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.	Type A Construction applies to both buildings. **Performance Solution:** Fire rating of external walls are within 6m of fire source feature (another building on same allotment) being; + Existing and extended community health building. **Refer to Spec C1.1 & Appendix 3 for the table of FRL's.**
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.	**Noted:** Higher FRL of each classification to apply or be fire separated.
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).	**Compliance Readily Achievable:** Detail to be provided at the 109R Crown Certificate stage.
C1.10 - Early fire hazard properties	The fire hazard properties of the outlined linings, materials and assemblies in a Class 2 to 9 building must comply with Specification C1.10	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
Part C2	***Fire Compartmentation & Separation***	
C2.2 General floor area limitations	This clause sets out the parameters for the area and volume of Class 5& 9 buildings as required by sub-clauses (a), (b) & (c).	**Further Information Required:** Architect to confirm the volume of the new Acute building, in particular with the central void connecting all 4 storeys.

CLAUSE	REFERENCE	COMMENT
C2.5 Class 9a and 9c buildings	Class 9a health care building must comply with the following: + Patient care areas must be divided into fire compartments not exceeding 2000 m^2. + Ward areas— a) where the floor area exceeds 1000 m², must be divided into floor areas not more than 1000 m² by walls with an FRL of not less than 60/60/60 (See diagram 2); and b) where the floor area exceeds 500 m², must be divided into areas not more than 500 m² by smoke proof walls complying with Specification C2.5 (See diagram 3); and c) where division of ward areas by fire-resisting walls is not required (i.e. if the patient care area was less than 1,000m^2), any smoke-proof wall required under (B) above must have an FRL of not less than 60/60/60. + Treatment areas must be divided into floor areas not more than 1000 m² by smoke-proof walls complying with Specification C2.5 In addition to the above, all ancillary use areas located within a patient care area and containing equipment or materials that are a high potential fire hazard, must be separated from the remainder of the patient care area by walls with an FRL of not less than 60/60/60. These areas include, but are not limited to, the following: a) A kitchen and related food preparation areas having a combined floor area of more than 30 m². b) A room used predominantly for the storage of medical records having a floor area of more than 10 m². A laundry, where items of equipment are of the type that is potential fire sources (e.g. gas fire dryers).	**Performance Solution:** In regards to the new acute building; + Smoke compartment size are to be addressed through fire engineered performance solution. Max. smoke compartment size is 560m². + We recommend providing wall that are noted as smoke wall to be upgraded to 2hr fire and smoke walls. This assists with horizontal evacuation and travel distances. + The fire compartment on ground floor SARU is to be divided further, no smoke compartment to exceed greater than approx. 560m². **Further Information Required:** + In regards to refurbished Oncology unit, architect to confirm this building is <1,000m. The Oncology part is to be fire separated from the remainder of the building by construction having an FRL of 120/120/120. + The new medical records room must be fire separated by construction having FRL of not less than 60/60/60.
C2.6 Spandrels	In a building of Type A or Type B construction (Class 9a buildings), if 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 spandrel with an FRL of 60/60/60. For the purposes of C2.6, a window or other opening means that part of the external wall of a building that does not have an FRL of at least 60/60/60.	**Noted:** Not applicable to sprinkler protected buildings.

CLAUSE	REFERENCE	COMMENT
C2.7 Separation by fire walls	Separation of Fire Compartments must be constructed in accordance with the following: + FRL of 120/120/120 and extend to the underside of a floor with the same FRL, or to the underside of a non-combustible roof covering. + Except where permitted by Part C3, any openings in a fire wall must not reduce the FRL (i.e. fire doors; protection of services). + Building elements, other than roof battens with maximum dimensions of 75mm x 50mm or sarking-type material, must not pass through the fire wall unless the required fire resisting performance of the fire wall is maintained.	**Compliance Readily Achievable:** Detail to be provided at the 109R Crown Certificate stage.
C2.8 Separation of classifications in the same storey	Each building element in that storey must have the higher FRL prescribed in Specification C1.1 or have those parts of the building separated by a fire wall.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
C2.9 Separation of classifications in different storeys	Parts of different classification that are situated one above the other in adjoining storeys must be separated as follows: Type A construction – The floor between the adjoining parts must have an FRL of not less than that prescribed in Specification C1.1 for the classification of the lower storey.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
C2.10 Separation of lift shafts	This clause applies to all classes of buildings and specifies the protection requirements for openings for lift shafts and lift landing doors. The requirements are set out in sub-clauses (a), (b) (c) & (d) which relate to openings in Type A, B and C construction. Also note the Deemed to Satisfy Provisions of Part C3.	**Compliance Readily Achievable:** Lift shafts are required to be separated from the remainder of the building by construction achieving an FRL of 120/120/120. Details to be clearly shown at 109R Crown Certificate stage.
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: + Lift motors and lift control panels; or + 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.	**Further Information Required:** Details of fire separation with a minimum FRL of 120/120/120 to any of the applicable areas of new work – e.g. pumproom and stair pressurisation equipment, to be clearly shown at 109R Crown Certificate stage. Particular attention should also be drawn to comms rooms if they have UPS or battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.
C2.13 Electricity supply system	To ensure certain types of electrical equipment to operate during an emergency the requirements of sub-clauses (a), (b) (c), (d) & (e) must be complied with relating to sub-stations, sub-mains and main switchboards.	**Compliance Readily Achievable:** Details of fire separation with a minimum FRL of 120/120/120 to any of the applicable substations or main switchboards to be clearly shown at 109R Crown Certificate stage.
Part C3	***Protection of Openings***	
C3.1 Application of part	Openings listed in C3.1(a) need not comply with the Deemed-to-Satisfy Provisions of Part C3.	**Noted**

CLAUSE	REFERENCE	COMMENT
C3.2 Protection of openings in external walls	This part outlines the requirements for the protection of openings in an external wall. Openings in an external wall required to have an FRL must be protected in accordance with C3.4 if the distance between the opening and the fire-source feature is less than- + 3m from a side or rear boundary of the allotment; or + 6m from the far boundary of a fire-source feature if not located in a storey at or near ground level; or + 6m from another building on the allotment that is not class 10 If required to be protected, the opening must not occupy more than 1/3 of the area of the external wall of the storey in which it is located.	**Performance Solution**: The following areas have windows in external walls that are exposed with 6m of existing buildings; + New acute building and new community mental health extension.

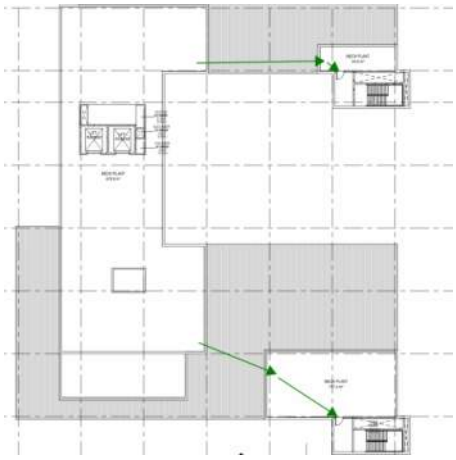
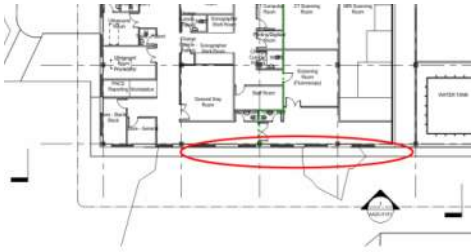
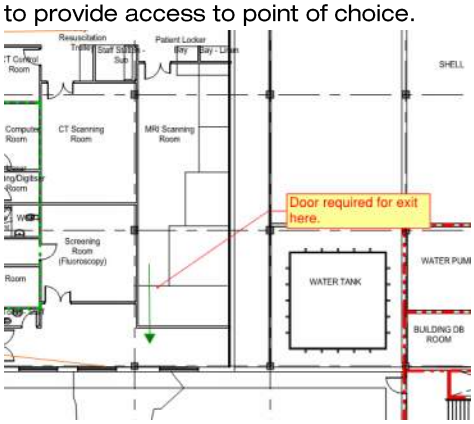
C3.3 Separation of external walls and associated openings in different fire compartments	The distance between parts of external walls and any openings within them in different fire compartments separated by a fire wall must be at least that set out in Table C3.3 unless- + Those parts of each wall have an FRL of at least 60/60/60; and + Any openings protected in accordance with C3.4. Method of measurement between adjoining fire comportments is set out below:- **Angle between walls** / **Min. Distance** 0° (walls opposite) / 6m More than 0° to 45° / 5m More than 45° to 90° / 4m More than 90° to 135° / 3m More than 135° to 180° / 2m 0° or more / Nil	**Performance Solution:** The following protection of openings between different compartments will be rationalised in the fire engineering report;  Lower Ground  Ground floor  Level 1

CLAUSE	REFERENCE	COMMENT
		 Level 2
C3.4 Acceptable methods of protection	Where protection is required, doorways, windows and other openings must be protected as follows: + Doorways – (a) Internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or (b) -/60/30 fire doors that are self-closing or automatic closing. + Windows – (a) Internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or (b) -/60/- automatic closing fire shutters. + Other openings – (a) Excluding voids – internal or external wall-wetting sprinklers, as appropriate; or (b) Construction having FRL not less than -/60/-.	**Compliance Readily Achievable**: Detail the applicable method of protection where applicable.
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.	**Compliance Readily Achievable**: Details to be provided at the 109R Crown Certificate stage**.**
C3.7 Protection of doorways in horizontal exits	A horizontal exit must be protected by a single fire door to have an FRL as required by Specification C1.1 for the wall. Doors must be self-closing or automatic-closing and gives details of the deemed-to-satisfy methods of activation.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
C3.8 Openings in fire isolated exits	Specifies that the doorways that open into fire-isolated exits must be protected by -/60/30 fire doors that are self-closing or automatic. This clause also details the deemed-to-satisfy methods of activation. This does not apply to doors opening to a road or open space. A window in the external walls of fire-isolated exits must be protected in accordance with C3.4 if it is within 6m of and exposed to a window or other opening in a wall of the same building other than in the same fire-isolated enclosure.	**Compliance Readily Achievable**: Details to be provided at the 109R Crown Certificate stage.

CLAUSE	REFERENCE	COMMENT
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 D2.7I, ducting associated with a pressurisation system or water supply pipes for fire services.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
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 backed by construction having an FRL of not less than -/60/60 if it exceeds 35000mm²	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
C3.12 Openings in floors 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.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
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).	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
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 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.	**Performance Solution** The method of fire stopping medical gases passing through fire rated walls and floors and are to be addressed in the fire engineering report.
C3.16 Construction joints	Construction joints, spaces and the like in and between building elements required to be fire-resisting with respect to integrity and insulation must be protected in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the required FRL.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
C3.17 Columns protected with lightweight construction to achieve an FRL	A column protected by lightweight construction to achieve an FRL which passes through a building element that is required to have an FRL or a resistance to the incipient spread of fire, must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the required FRL or resistance to the incipient spread of fire.	**Compliance Readily Achievable:** Details to be provided at the 109R Crown Certificate stage.
Spec.	***Specifications***	
Spec C1.1 Fire resistance construction	The new building works are required to comply with the requirements detailed under Table 3 of Specification C1.1 for Type A Construction.	**Further Information Required:** Further specific details are required on the use and extent of Aluminium Composite Panels. Further information is require regarding the structure of the pedestrian link bridge on level 1 from the new acute building to existing hospital building. The bridge is required to be constructed with FRL of 2hrs or addressed in the fire engineered performance solution.

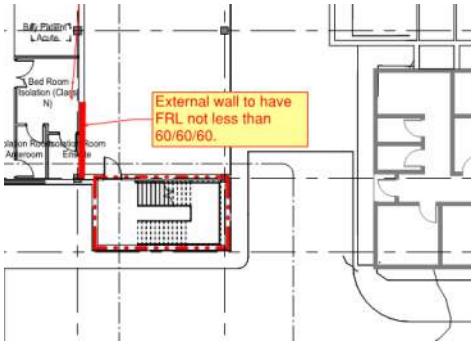
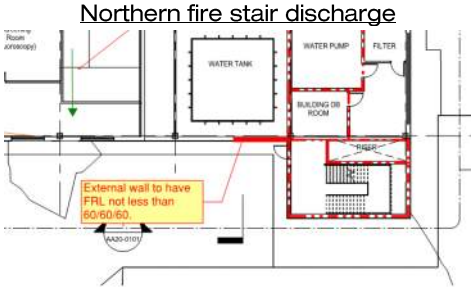
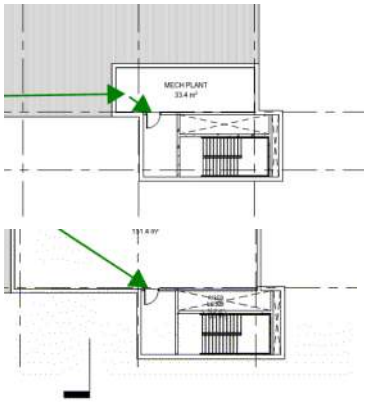
CLAUSE	REFERENCE	COMMENT
Spec C2.5/C3.4 Smoke-Proof Walls in Health-Care and Aged Care Buildings	Class 9a health-care buildings Smoke-proof walls required by C2.5 must- + Be non-combustible and extend to the underside of; the floor above, or a non-combustible roof lining, or a ceiling with a resistance to the incipient spread of fire of 60 minutes. + Have all openings around penetrations and junctions of the smoke-proof wall and the remainder of the building stopped with a non-combustible material. + Incorporate smoke dampers where air-handling ducts penetrate smoke walls unless pertaining to a smoke hazard management system. a) Minimum 400mm deep smoke reservoir is to be provided above each smoke door located in a smoke wall to prevent the passage of smoke. As an alternative to the required 400mm smoke reservoir which may not be able to be achieved, it is possible to 'locally' provide perforated ceiling system on each side of the doorway for the width of the door opening	**Compliance Readily Achievable**: The referenced plans do not show sufficient information to establish compliance with this clause. Design certification, should be submitted with the application for the 109R Crown Certificate stage.
Spec C3.4 Fire doors and smoke doors	Fire doors must comply with AS1905.1 and not fail the period specified for integrity in the required FRL due to glazed parts. Smoke doors must be constructed to prevent the free passage of smoke from one side of the doorway to the other. If they are glazed, there must be minimal danger of a person being injured by walking in to them. A smoke door must be constructed as follows- + The door must swing in direction of egress, or both directions. + The leaves are capable of resisting smoke at 200°C for 30 minutes. Solid core leaves of minimum 35mm thick satisfy. + The leaves are fitted with smoke seals. + The leaves are normally in the closed position, or the leaves are closed automatically through interface with smoke detectors present on each side of the doorway no more than 1.5m horizontal distance from the doorway. In the event of a power failure, the leaves must fail-safe to the closed position. + The leaves return to the fully closed position after each manual opening. + Any glazing part complies with AS1288. If a glazed panel may be mistake for an unobstructed exit, identification via opaque construction must be present. A required fire shutter or fire window must be identical with a tested prototype that has met the required FRL, as well as installed in the same manner. A required fire shutter must be a steel shutter complying with AS1905.2 if a metallic fire shutter is not prohibited by C3.5 and must be in accordance with sub-clause 4(b).	**Performance Solution:** Smoke doors and fire doors in horizontal exit will not swing in both directions and is to be addressed in the fire engineering report. **Further Information Required:** The referenced plans do not show sufficient information to establish compliance with this clause. Further details, should be submitted with the application for the 109R Crown Certificate stage.

CLAUSE	REFERENCE	COMMENT
SECTION D	**ACCESS AND EGRESS**	
Part D1	***Provisions for Escape***	

D1.2 Number of exits required	All buildings must have at least one exit from each storey. Class 9 buildings must have at least 2 exits from each storey for the following; + Any storey which includes a patient care area in a Class 9a area. + Each storey in a Class 9b building used as an early childhood centre. + Each storey in a primary or secondary school with a rise in storeys of 2 or more. + Any storey or mezzanine that accommodates more than 50 persons, calculated under D1.13. In a patient care areas in 9a buildings, at least one exit must be provided from every part of a storey which has been divided into fire compartments in accordance with C2.2 and C2.5.	**Further Information Required:** The central Plant room on Level 3 requires access to the fire stairs, refer below.  An additional exit to open space is required to southern side lower ground floor medical imaging.  An additional doorway is required from the MRI scanning room on lower ground, to provide access to point of choice.  Confirmation required if egress for pathology is provided by stairway. The new link is "enclosing" the existing pathology building therefore egress from this building must be considered.

CLAUSE	REFERENCE	COMMENT
		
D1.3 When Fire isolated exits are required	Class 9a – All stairways in class 9a patient care areas must be fire-isolated. An extra storey of any classification can be included if the building has a sprinkler system throughout; or if the stair is not providing access from or egress to the additional storey, and is separated by construction achieving an FRL of 60/60/60, and is smoke proof.	**Performance Solution:** The central non fire isolated stair connects 3 levels (non patient care) and shall be addressed in the fire engineering report.
D1.4 Exit travel distances	For class 9a building the following applies: + In a *non*-patient care area: o 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. *Note: Non patient care areas include staff areas, public circulation areas, lift lobbies, plant rooms and the like.* + In a patient care area: o No point on the floor must be more than 12m from a point from which travel in different directions to 2 of the required exits is available; and The maximum distance to one of those exits must not be more than 30m from the starting point.	**Performance Solution:** The following exit travel distances shall be addressed in the fire engineering report. *Note: These distance may be subject to change as design develops further.* New acute building - Lower ground + 15m to point of choice from security staff office in ED department + 15m to point of choice from staff room in medical imagining. New acute building – Ground floor + 25m Point of choice ground floor main reception desk. + 15m to point of choice from outdoor terrace on North East corner of maternity. Existing refurbished buildings- Pathology, Pharmacy, Kiosk (non patient care) + 25m to point of choice and 50m to nearest exit. New acute building – Level 1 + Point of choice up to 13m in IPU + Point of choice up to 14m in patient Bay recovery in Perioperative. New acute building – Level 2 + A re-design is required of the south-western room – travel distance to point of choice is currently 15m which cannot be justified in the fire engineered performance solution.

CLAUSE	REFERENCE	COMMENT
		 + Distance to nearest exit up to 32m from South – West corner.
D1.5 Distances between alternative exits	Exits required as alternative exits must be – (a) distributed as uniformly as practicable within or around the storey served and in positions where unobstructed access to at least 2 exits is readily available from all points on the floor including lift lobby areas; and (i) not less than 9m apart; and (ii) not more than + In a Class 9a health-care building, if such required exit serves a patient care area – 45m apart; or + 60m apart in all other cases (class 6 and 7a buildings). (c) Located so that the alternative paths of travel do not converge such that they become less than 6m apart.	**Performance Solution:** The following exit travel distances between alternative shall be addressed in the fire engineering report. Existing refurbished buildings- Pathology, Pharmacy, Kiosk (non patient care) + 70m between exits. Community Health building (non patient care + 75m from courtyard of community health building.
D1.6 Dimensions of exits	The unobstructed height throughout a required exit must not be less than 2m and not less than 1980mm for a doorway. In a class 9a building a required exit or path of travel to an exit: a) Clear height of 2m and 1980mm through doorways. b) The width of a path of travel, except for doorways must not be less than - + 1m; or + 1.8m for passage ways normally used to transport patients in beds in class 9a buildings c) The unobstructed width of doorways must be not less than – + In patient care areas where patients are normally transported in beds, a corridor width of – ○ Less than 2.2m – 1200mm ○ More than 2.2m – 1070mm + In patient care areas in a horizontal exit – 1250mm d) The unobstructed width through other exit doorways (not indicated above or required to be accessible), the required exit width minus 250mm.	**Compliance Readily Achievable:** Details to be included into the design.

CLAUSE	REFERENCE	COMMENT
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. In a fire-isolated ramp must be provided at any change in floor level less than 600mm A ramp for changes of level in a fire isolated passageway is required in a Class 9 building. 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, 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.	**Further Information Required:** The discharge of the Northern fire stair shall comply with D1.7(b)(ii) i 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. Where passing by external of the building is required, the external wall must have FRL not less than 60/60/60, see below;  Northern fire stair discharge  Southern fire stair discharge **Performance Solution:** Level 3 plant rooms open directly into fire stair without an airlock, or lobby. 

CLAUSE	REFERENCE	COMMENT
D1.9 Travel by non-fire isolated stairways or ramps	In a class 5, 6, 7, 8 or 9 building, the distance from any point on a floor to a point of egress through a non-fire-isolated path must not exceed 80m In a class 5, 6, 7, 8 or 9b, a non-fire-isolated exit must discharge a maximum of – + 20m from a doorway providing egress to a road or open space or from a fire-isolated exit; or + 40m from one of two doorways/passageways if they are located in approximately opposite directions.	**Compliance Readily Achievable:** Details to be included into the design.
D1.10 Discharge from exits	Requires that an exit must not be blocked at the point of discharge. Barriers such as bollards must be installed to prevent vehicles from blocking the discharge from exits. If a required exit leads to an open space, the path of travel to the road must have a width at least the minimum width of the required exit or 1 m If an exit discharges to open space that is at a different level than the public road, the path of travel to the road must be by a ramp except if the exit is from a Class 9a building, a complying stairway may be constructed.	**Further Information Required:** Details to be included into the design. In particular exiting exit from the oncology unit.
D1.11 Horizontal exits	In a Class 9a building, horizontal exits may be counted as required exits if the path of travel from a fire compartment leads by one or more horizontal exits directly into another fire compartment which has at least one required exit which is not a horizontal exit. Horizontal exits must have a clear area of 2.5m^2 per patient (9a) In other cases, horizontal exits must not comprise more than half of the required exits from any part of the storey divided by a fire wall. Horizontal exits must have an area of 0.5m^2 per person.	**Performance Solution:** Discharge of horizontal exits into fire compartments without an egress stairway or direct to open space occurs at level 1 and 2. The required clear space on the egress side of the fire wall will also be assessed in the fire engineering report.

CLAUSE	REFERENCE	COMMENT
D1.12 Non-required stairways, ramps or escalators	An escalator, moving walkway or non-required non fire-isolated stairway or pedestrian ramp must not be used between storeys in a patient care area of a Class 9a or Class 9c building. Must also not connect more than 2 storeys in a Class 5, 6, 7, 8 or 9 building unless permitted by above.	**Performance Solution:** Refer to Clause D1.3, the central stair connecting 3 levels shall be addressed in the fire engineering report.
D.13 Number of persons accommodated	Outlines the number of persons accommodated in a storey as per Table D1.13 of BCA 2016.	**Noted.**
D1.16 Plant rooms & lift motor rooms concession	A ladder may be used in lieu of a stairway to provide egress from a plant room with a floor area of not more than 100m^2 or all but one point of egress from a plant room or a lift machine room with a floor area not more than 200m^2. Sub-clause (b) sets out the parameters for the ladders permitted to be used in this circumstance.	**Compliance Readily Achievable:** Details to be included into the design.
D1.17 Access to lifts pits	This clause provides the requirements for access to lift pits not more than 3m deep and the requirements of construction of access for lift pits that are more than 3m deep. The requirements for signage to lift pits are also set out.	**Compliance Readily Achievable:** Details to be included into the design.
PART D2	***Construction of Exits***	
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.	**Compliance Readily Achievable:** Details to be included into the design.
D2.3 Non-fire-isolated stairways and ramps	This clause requires that required non-fire-isolated stairways and ramps must be either constructed in accordance with D2.2 or the alternative options set out in D2.3 (a) to (c). In a building with a rise in storeys of more than 2, required non-fire-isolated stairways and ramps must be either constructed in accordance with D2.2 or – + Reinforced or prestressed concrete; or + Steel at least 6mm thick at all points; or + Timber that has a finished thickness of at least 44mm, has an average density of at least 800 kg/m^3 at a moisture content of 12% and has not been joined by means of glue unless it has been laminated and glued with resorcinol/phenol formaldehyde.	**Compliance Readily Achievable:** Details to be included into the design, central stairway to comply with these provisions.
D2.4 Separation of rising and descending stair flights	In a required fire-isolated stairway there must be no direction connection between – + A flight rising from a storey below the level of access to open space; and + A flight descending from a storey above that level.	**Complies:** There is no rising and descending stair flights in any of the fire-isolated stairways.