



DESIGN CONFIDENCE

SCEGGS Darlinghurst Limited

BCA Design Assessment Report

SCEGGS Darlinghurst – Masterplan 2040
215 Forbes Street,
Darlinghurst

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Revision History:

OUR REFERENCE	REMARKS	ISSUE DATE
P218_153-1 (BCA) LS	Report based upon architectural drawings titled DRAFT SSD Application 28.09.2018.	19 October 2018
	Report issued to design team for review.	
P218_153-2 (BCA) LS	Report updated to reflect comments from stakeholders	08 November 2018
	FINAL Report issued.	

EXECUTIVE SUMMARY

This BCA Design Assessment report has been prepared by Design Confidence at the request of Sandrick Project Directions on behalf of SCEGGS Darlinghurst Limited. With respect to the assessment undertaken the following areas in particular need further review as the project develops –

NO.	ITEMS FOR FURTHER CONSIDERATION	RESPONSIBILITY
1.	MASTERPLAN	
1.1	Co-ordination and consideration needs to be given to the introduction of fire walls to provide adequate separation between the existing buildings (being the Chapel Building & Barham Building) and the proposed new buildings (being the multi-purpose building and new administrative building).	All
2.	WILKINSON HOUSE	
2.1	<p>Wilkinson House and the Joan Freeman Science and Technology Building have been considered a single building, whilst the Sports Hall has been considered a separate building.</p> <p>A fire wall separating the Centenary Sports Hall from the other building needs to be introduced to ensure adequate separation occurs.</p>	All
2.2	<p>The following building elements and their components must be non-combustible –</p> <ul style="list-style-type: none"> i. External walls and common walls, including all components incorporated in them, including the façade covering, framing and insulation ii. The flooring and floor framing of lift pits; iii. Non-loadbearing internal walls where they are required to be fire-resisting. 	Project Architect
2.3	<p>Advice regarding Wilkinson House and whether it will be sprinkler protected, it is noted that Joan Freeman Science and The Technology building are sprinkler protected.</p> <p>In the event Wilkinson House is not sprinkler protected then it will need to be separated from Joan Freeman Science and The Technology building with a fire wall which achieves an FRL of not less than 120/120/120.</p>	ALL
2.4	<p>Wilkinson House and The Joan Freeman Science and Technology building have been considered a single building, hence an assessment of the buildings existing and proposed essential fire safety measures need to be undertaken to ensure that this can occur.</p> <p>It is suggested that a report be prepared by the building services engineers outlining the existing essential measures installed within Joan Freeman Science and The Technology buildings to determine whether they comply with the current design standards or whether they will need to be upgraded to align with the proposed essential measures being installed within Wilkinson House, areas of concern are –</p> <ul style="list-style-type: none"> i. Smoke detection and alarm systems ii. Sprinkler systems iii. Fire Hydrant systems iv. Emergency lighting and exit signage v. Mechanical air-handling 	Building Services Engineer

NO.	ITEMS FOR FURTHER CONSIDERATION	RESPONSIBILITY
2.5	Advise whether an increase in school numbers, both students and staff will occur due to the redevelopment of Wilkinson House, this will assist with determining the required number of sanitary facilities.	Project Architect
2.6.	Architectural drawings are to be updated to include the following essential fire safety measures – <ul style="list-style-type: none"> i. Fire brigade booster assembly; ii. Location of the fire indicator panel; iii. Location of the sprinkler alarm valves; iv. Fire Hose reel enclosures / cabinets 	Project Architect
2.7.	A test report from a Registered Testing Authority must be provided to certify that the façade / external walls achieve compliance with BCA FP1.4 and FV1.	All

In addition to undertaking a detailed assessment of the design against the perspective requirements of the BCA a preliminary performance based assessment has also been undertaken. The purpose of the assessment was to look at the incorporation of a performance based design may add value in-lieu of complying with the prescriptive (DtS) provisions.

Table 2 below lists scenarios where we believe the adoption of a performance design may add value to development –

NO.	DESIGN EFFICIENCIES	RESPONSIBILITY
FIRE SAFETY		
1.	Stairway design / lobby / open not fire-isolated.	ALL
2.	Hybrid / mixture of design standards for both existing and proposed fire safety measures provided within Wilkinson House, Joan Freeman Science and The Technology building/	ALL
ACCESSIBILITY		
2.	Refer to Access Design Assessment Report, as prepared by Design Confidence	ALL
OTHER ITEMS		
3.	As the design develops Design Confidence will continue to advice on performance based design options which may be of benefit to the design team.	ALL

Be advised that the adoption of performance solutions for fire safety matters may be subject to consultation with the NSW Fire Brigade as part of the Construction Certificate process under Clause 144 of the Environmental Planning & Assessment Regulation 2000.

1.0 INTRODUCTION

1.1 General

This BCA Design Assessment report has been prepared at the request of Sandrick Project Directions on behalf of SCEGGS Darlinghurst Limited to accompany a State Significant Development Application for the proposed masterplan and redevelopment of the Sydney Church of England Girls' Grammar School, Darlinghurst (SCEGGS) site at 215 Forbes Street, Darlinghurst.

The State Significant Development is for –

- (i) The Masterplan Concept Development Application for building envelopes, building locations and land uses across the campus, to guide development over the next 20 years, and;
- (ii) Stage 1 Detailed Design Proposal for the first stage of works, comprising the replacement of Wilkinson House with a new building.

This report is based upon, and limited to, the information depicted in the documentation provided for assessment, and does not make any assumptions regarding 'design intention' or the like.

1.2 Purpose of report

The purpose of this report is to identify the extent to which the architectural design documentation complies with the prescriptive provisions of the Building Code of Australia (BCA) Volume 1, edition 2016 – amendment 1.

1.3 Documentation Provided for Assessment

This assessment is based upon the Architectural documentation prepared by TKD Architects and listed within Appendix 1.

1.4 Report Exclusions

It is conveyed that this report should not be construed to infer that an assessment for compliance with the following has been undertaken –

- (i) Work Health & Safety Act and Regulations;
- (ii) WorkCover Authority requirements;
- (iii) Structural and Services Design Documentation;
- (iv) The individual requirements of service authorities (i.e. Telecommunication Carriers, Sydney Water, Endeavour Energy);
- (v) The Disability Discrimination Act (DDA) 1992;
- (vi) The Accessibility Requirements of the BCA, as contained within D3 and F2.4 of the BCA;
- (vii) The Energy Efficiency Provisions of the BCA, as contained with Section J of the BCA;
- (viii) An assessment of any existing building located on the allotment;

2.0 DEVELOPMENT DESCRIPTION

2.1 General

The SSD DA seeks development consent for –

1. Concept approval of the 2040 Masterplan for the SCEGGS Darlinghurst campus, including –
 - Conceptual approval for the demolition of the following buildings:
 - Wilkinson House fronting Forbes Street
 - Library and science building fronting Bourke Street
 - The old gym building at the northern end of Thomson Street
 - Part of the additions to the Barham Building fronting Forbes Street
 - Building envelopes and land use for the following new buildings:
 - Four-storey school building at the corner of Forbes Street and St Peters Street for general school purposes
 - Maximum seven storey multi-purpose building fronting Bourke Street for general school purposes and a potential centre based child care facility
 - On-site vehicular drop-off with associated car parking from Bourke Street within the multi-purpose building
 - Maximum three-storey administration building fronting Forbes Street for general school purposes
 - Conservation works to the existing Barham Building within the school premises to remove non-original building fabric and use for general school purposes
2. Detailed consent for the demolition of Wilkinson House, basement excavation, and construction of a new four storey building (new Wilkinson House) comprising approximately 1,507sqm of gross floor area (GFA) and a maximum height of 15m for the purposes of new teaching and education spaces.

In accordance with the Building Code of Australia, the assessment undertaken herein relates to the masterplan and redevelopment of the Sydney Church of England Girls' Grammar School, Darlinghurst (SCEGGS) site at 215 Forbes Street, Darlinghurst.

For the purpose of the Building Code of Australia (BCA) the subject development may be described as contained below.

2.2 Building Description

Table 2 – Building Characteristics

DESCRIPTION OR REQUIREMENT		
Building Classification	Wilkinson House Redevelopment	9b
	New Admin Building / Barham Restoration	9b
	New Multi-purpose Building	9b
Rise in Storeys	Wilkinson House Redevelopment	Five (5)
	New Admin Building / Barham Restoration	Four (4)
	New Multi-purpose Building	Seven (7)
Construction Type	Wilkinson House Redevelopment	Type A
	New Admin Building / Barham Restoration	Type A
	New Multi-purpose Building	Type A
Effective Height	Wilkinson House Redevelopment	>12m (being 13.8m)
	New Admin Building / Barham Restoration	>12m (being 23.9m)
	New Multi-purpose Building	>12m (being 13.8m)
Floor Area & Volume	Wilkinson House Redevelopment	~1,446m ²
	New Admin Building / Barham Restoration	~821m ²
	New Multi-purpose Building	~5,659m ²
Climate Zone:	Climate Zone 5	

2.3 BCA Interpretation Notes

To provide the reader with additional context, the following information regarding the assessment methodology used in this assessment is provided below –

- (i) Wilkinson House and the Joan Freeman Science and Technology building have been considered a single building, whilst the Centenary Sports Hall has been considered a separate building.

3.0 MASTERPLAN ASSESSMENT

3.1 General

As stated previously SCEGGS Darlinghurst are proposing to undertake building and refurbishment works over the next 20 years. The proposal in its current form is conceptual, hence the advice provided below, with respect to the Building Code of Australia (BCA), is also conceptual and outlines a strategy to address compliance as the design develops.

The subject strategy below addresses the connection between the existing and proposed buildings rather than looking at the proposed buildings, other than Wilkinson House which is discussed in greater detail in Sections 4 & 5 below. The reasoning being that the new buildings will be capable of complying with applicable BCA at the time construction commences.

3.2 Chapel Building & Barham Building

The Chapel Building & Barham Building are proposed to be retained and are understood to have significance from a heritage perspective. The subject buildings are central to the proposed masterplan as the multi-purpose building will bound the rear (western) wall of the Chapel building, whilst the new administrative building bounds the eastern wall of the Barham building.

The subject buildings consist of a mixture of timber and masonry, hence when assessed against the current BCA, the building elements within each building would do not comply with current code requirements nor would it be possible to upgrade the buildings to comply in full.

The subject concept development proposes an internal connection between all four (4) buildings, the Chapel Building & the Barham Building are already connected via an elevated walkway, from a BCA perspective they are then considered a single building.

Therefore, based upon the above the proposed strategy is required to address the following points –

- (i) Permit the retention of existing building fabric throughout The Chapel Building & The Barham Building;
- (ii) Permit an internal pedestrian connection between all four buildings;
- (iii) Floor area and volume limitations, the buildings will need to be divided into fire compartments;
- (iv) Setbacks from property boundaries and other buildings located on the allotment.

4.0 BCA ASSESSMENT SUMMARY – WILKINSON HOUSE

4.1 General

The following table summarises the compliance status of the architectural design in terms of each *applicable* prescriptive provision of the BCA and indicates a capability for compliance with the BCA.

Although, it should be recognised that instances exist where 'Prescriptive non-compliance' occurs, or 'design detail' is required.

Such instances should not necessarily be considered BCA deficiencies; but matters, which need to be considered by the design team and any assessment authority at relevant stages of design and/or assessment.

For those instances of either 'prescriptive non-compliance' or 'design detail', a detailed analysis and commentary is provided within Part 4.0 of this report.

4.2 Section B: Structure

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
B1.1	resistance to actions			✓
B1.2	determination of individual actions			✓
B1.4	materials and form of construction			✓

4.3 Section C: Fire Resistance

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
C1.1	fire resisting construction			✓
C1.8	lightweight construction			✓
C1.10	fire hazard properties			✓
C2.2	general floor area & volume limitations			✓
C2.6	vertical separation			✓
C2.7	separation by fire walls			
C2.10	separation of lift shafts			✓
C2.11	stairways and lifts in one shaft		✓	
C2.12	separation of equipment			✓
C2.13	electricity supply system			✓
C3.2	protection of openings		✓	
C3.4	methods of protection			✓
C3.5	doorways in fire walls			✓
C3.9	service penetrations in fire-isolated exits			✓
C3.10	openings in fire-isolated lift shafts			✓
C3.12	openings in floors and ceilings			✓

BCA CLAUSE	COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
C3.13	openings in shafts		✓
C3.15	openings for service installation		✓
C3.16	construction joints		✓
C3.17	columns protected in lightweight		✓

4.4 Section D: Access & Egress

BCA CLAUSE	COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
D1.2	number exits required	✓	
D1.3	fire-isolated exits	✓	
D1.4	exit travel distances	✓	
D1.5	distance between alternative exits	✓	
D1.6	dimensions of exits and paths of travel to exits		✓
D1.7	Travel via fire-isolated exits	✓	
D1.9	travel by non-fire isolated stairways and ramps	✓	
D1.10	discharge from exits	✓	
D1.13	number of persons accommodated	✓	
D1.16	Plant rooms	✓	
D1.17	access to lift pits		✓
D2.2	fire-isolated exits		✓
D2.3	non fire-isolated stairways and ramps		✓
D2.7	installations in exits and paths of travel		✓
D2.8	Enclosure of space under stairs	✓	
D2.9	Stairway width		✓
D2.13	goings and risers		✓
D2.14	landings		✓
D2.15	thresholds		✓
D2.16	balustrades		✓
D2.17	handrails		✓
D2.19	doorways and doors	✓	
D2.20	swinging doors	✓	
D2.21	operation of latch		✓
D2.23	signage		✓

4.5 Section E: Services & Equipment

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
E1.3	fire hydrants			✓
E1.4	fire hose reels			✓
E1.5	sprinklers			✓
E1.6	portable fire extinguishers			✓
E2.2	general provisions			✓
E3.1	lift installations			✓
E3.2	Stretchers lift			✓
E3.3	warning against use of lifts			✓
E4.2	emergency lighting			✓
E4.5	exit signs			✓
E4.6	design and operation of exit signs			✓
E4.9	sound systems and intercom systems for emergency purposes			✓

4.6 Section F: Health & Amenity

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
F1.1	storm water design			✓
F1.4	external above ground membranes			✓
F1.5	roof coverings			✓
F1.6	sarking			✓
F1.7	waterproofing of wet areas			✓
F1.9	damp-proofing			✓
F1.10	damp-proofing of floors on the ground			✓
F1.11	provision of floor wastes			✓
F1.13	glazing			✓
F2.3	sanitary facilities			✓
F2.5	construction of sanitary compartments	✓		
F3.1	height of rooms and other spaces			✓
F4.4	artificial lighting			✓
F4.5	ventilation of rooms			✓
F4.8	position of water closets	✓		

4.7 Section G - Ancillary Provisions

BCA CLAUSE		COMPLIES	DOES NOT COMPLY	ADDITIONAL DESIGN INPUT
G1.101	provision for cleaning windows			✓

5.0 BCA DETAILED ASSESSMENT – WILKINSON HOUSE

5.1 General

With reference to the 'BCA Assessment Summary' contained within Part 3 of this report, the following detailed analysis and commentary is provided.

This commentary is formulated to enable the design documentation to be further progressed, for the purpose of evidencing the attainment of compliance with the relevant provisions of the BCA.

5.2 Section B – Structure

Cl. B1.1 The resistance of a building or structure must be greater than the most critical action effect determined by B1.2 & B1.4 of the BCA and AS/NZS 1170.0-2002.

Cl. B1.2 The structural design of the building must be determined in accordance with the varying "actions" considerations contained within this clause (i.e. permanent actions, imposed actions, wind / snow / earthquake actions).

Cl. B1.4 The structural resistance of materials and forms of construction must be determined in accordance with the following:

- ☐ Masonry: AS3700-2011; and
- ☐ Concrete construction: AS3600-2009; and
- ☐ Steel construction: AS4100-1998 or AS/NZS4600-2005; and
- ☐ Glazed assemblies: AS1288-2006 & AS2047-1999; and
- ☐ Metal roofing: AS1562.1-1992.

5.3 Section C – Fire Resistance

- Cl. C1.1**
- ☐ External Walls
FRL 120/120/120
 - ☐ External Columns
FRL 120/--/-- if loadbearing.
 - ☐ Internal Walls
 - (i) FRL 120/120/120 or FRL --/120/120 (for non-loadbearing) fire-resisting lift and stair shafts; and
 - (ii) FRL 120/90/90 or FRL --/90/90 (if non-loadbearing) for ventilating, pipe, garbage and the like shafts not used for the discharge of hot products of combustion.
 - ☐ Other loadbearing internal walls, beams, trusses and columns
FRL 120/--/--.

<p>Cl. C1.1 Cont'd</p>	<p>❑ <u>Fire Walls</u></p> <p>120/120/120</p> <p>❑ <u>Floors</u></p> <p>(i) --/--/-- when laid directly on the ground; and (ii) FRL 120/120/120 in all other instances.</p> <p>❑ <u>Roofs</u></p> <p>(i) FRL of 120/60/30</p> <p>❑ <u>General Notes</u></p> <p>(i) Any internal walls required to achieve an FRL are to be constructed in accordance with one of the following methods -</p> <ul style="list-style-type: none"> ▪ Extend to the underside of the floor next above; and ▪ Extend to the underside of the roof covering. <p>(ii) A non-loadbearing shaft which is not for the discharge of hot products of combustion and must be constructed from non-combustible materials; and</p> <p>(iii) A loadbearing internal wall and a loadbearing fire wall must be of concrete or masonry; and</p> <p>(iv) The external walls must be of non-combustible construction; and</p> <p>(v) The flooring and floor framing in any lift pit must be of non-combustible construction; and</p> <p>(vi) Any shaft required to have an FRL must be enclosed at the top and bottom by construction having an FRL not less than that required for the walls of a non-loadbearing shaft, except that this provision does not apply if -</p> <ul style="list-style-type: none"> ▪ The top of the shaft extends beyond the roof covering; other than one enclosing a fire-isolated stairway; or ▪ The bottom of a shaft if it is non-combustible and laid directly on the ground.
<p>Cl. C1.8</p>	<p>Lightweight construction used in a wall system required to have an FRL or a lift, stairway or service shaft (refer to Spec. C1.1 above) must comply with this clause.</p> <p>If lightweight construction is used for the fire-resisting covering of any steel column/s (refer to BCA Spec C1.1 above), then any void must be filled solid, to a height of not less than 1.2m above the floor.</p>

Cl. C1.9	<p>The following building elements and their components must be non-combustible –</p> <ul style="list-style-type: none"> (i) External walls, including all components incorporated in them including the façade covering, framing and insulation; (ii) The flooring and floor framing of lift pits; (iii) Non-loadbearing internal walls where they are required to be fire-resisting.
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Cl. C1.10	<p>The general materials of construction must have fire hazard properties compliant with the following –</p> <ul style="list-style-type: none"> ❑ <u>Floor linings and floor coverings</u> <ul style="list-style-type: none"> (i) A critical radiant flux not less than 1.2kW/m²; and (ii) A critical radiant flux not less than 2.2kW/m² for any floor materials located within a fire-isolated stairway; and (iii) Group 1 or 2 for any portion of the floor covering that continues more than 150mm up a wall. ❑ <u>Wall lining and ceiling linings</u> <ul style="list-style-type: none"> (i) A material used as a finish, surface, lining or attachment to a wall or ceiling must be a Group 1 material in fire-isolated exits; and (ii) A material used as a finish, surface, lining or attachment to a wall or ceiling must be a Group 1 or Group 2 material in public corridors and ceilings of classrooms ; and (iii) A material used as a finish, surface, lining or attachment to a wall must be a Group 1 or Group 2 or Group 3 material in classrooms. ❑ <u>Air-handling ductwork</u> <p>Rigid and flexible ductwork must comply with the fire hazard properties set out in AS4254-2012.</p> ❑ <u>Lift cars</u> <ul style="list-style-type: none"> (i) Floor linings and floor coverings must have a critical radiant flux not less than 2.2kW/m²; and (ii) Wall and ceiling linings must be either a Group 1 or 2 materials. ❑ <u>Other materials</u> <ul style="list-style-type: none"> (i) Materials within the fire-isolated exits (other than sarking) are to have a smoke-developed Index not more than 2; (ii) Sarking type materials are to have a flammability index of 0 when located within a fire-isolated exit and not more than 5 in other locations; and (iii) Other materials & insulation materials are to have a spread-of-Flame index of not more than 9 and a smoke-developed index not more than 8 if the spread-of-flame is more than 5.
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Cl. C2.2	To ensure the subject building is within the maximum floor area and volume limitations prescribed within C2.2, the building is to be separated from the adjoining building known as a the Centenary Sports Hall.
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Compartmentation is to occur at every level, refer to Figure 1 below.

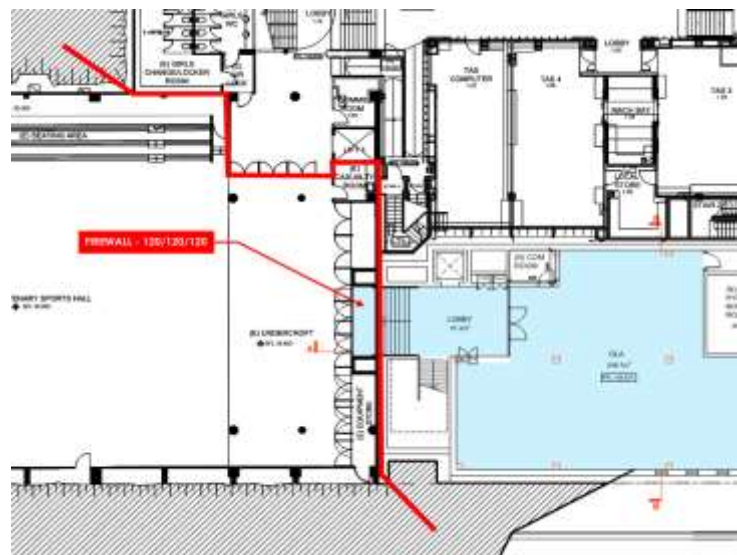


Figure 1 – Firewall location which separates the Wilkson Building from the Centenary Sports Hall

C2.6 Windows and other openings within external walls must be separated from windows and openings located in the storey above via one of the following methods of construction may be utilised to achieve compliance –

- (i) a spandrel or a curtain wall not less than 900mm in height which extends a minimum of 600mm above the upper surface of the intervening floor and is made of non-combustible material having an FRL of not less than 60/60/60 (tested on both sides); or
- (ii) A non-combustible slab with an FRL of 60/60/60 that projects outward from the external face of the wall not less than 1100mm and along the wall not less than 450 beyond the openings concerned; or

For the purpose of achieving compliance with the clause a window or other opening means any part of the external wall of a building that does not have an FRL of 60/60/60 (tested on both sides) or greater.

C2.7	<p>As stated in C2.2 above a fire wall needs to be introduced at all levels the buildings share a common wall or the like.</p> <p>Be advised that the DTS requirements of the BCA require the subject wall shown in Figure 1 to be constructed as follows –</p> <ul style="list-style-type: none"> (i) The passive / solid walls located between the two compartments is to achieve an FRL of not less than 120/120/120 and extend uninterrupted from the slab to slab; (ii) The doorway / opening which permits persons to pass through is to via a self-closing fire-rated doorsets that is tested to achieve an FRL of --/120/30
C2.10	<p>The lift shafts are required to achieve an FRL of 120/120/120 or --/120/120 (if non-loadbearing).</p>
C2.11	<p>The stairway and passenger lift proposed within the lobby connect five storeys (basement to level 3) and therefore are required to be fire-isolated and located in separate shafts.</p> <p>The proposal currently shows the subject stairway and lift in the same shaft and whilst the lift is located within a shaft which can be fire-rated appropriately the stairway is not enclosed / fire-isolated.</p> <p>The stairway design is discussed further in clause D1.3, however the current design may be capable subject to a performance based approach be adopted.</p>
Cl. C2.12	<p>If the lift motors or control panels are provided within a separate room, then the room is required to be separated from the remainder of the building by construction having an FRL of not less than 120/120/120 and have any doorway in that construction protected with a self-closing fire door having an FRL of not less than --/120/30.</p> <p>Pumpset/s for fire services shall comply with AS2419.1-2005.</p>
Cl. C2.13	<p>If the main switchboard sustains emergency equipment operating in emergency mode, then the switchboard shall be separated with construction achieving an FRL of 120/120/120 or /120/120 (if non-loadbearing) and any access doorway shall be protected with a self-closing fire door having an FRL of -/120/30.</p> <p>The emergency switchgear shall be separated from the nonemergency switchgear via a metal partition to minimise the spread of a fault from the non-emergency switchgear.</p> <p>For the purposes of the above, emergency equipment includes pump(s) for sprinklers and fire hydrant booster pumps.</p>

C3.2	<p>Wilkinson House, Joan Freeman Science and The Technology building have been considered a single building, whilst the Centenary Sports Hall has been considered a separate building, therefore the only new openings which are exposed to another building on the allotment are the lobby entry doorway located within the western façade on levels 1 & 2.</p> <p>With respect to the above openings one (1) or more of the following resolutions is required –</p> <ul style="list-style-type: none"> (i) Provide protection in accordance with Cl. C3.4 of the BCA (see clause below); or (ii) Pursue a Performance Solution / Fire Engineering Report with respect to this matter, demonstrating compliance with the Performance Requirements of the BCA.
Cl. C3.4	<p><input type="checkbox"/> <u>Windows</u></p> <ul style="list-style-type: none"> (i) External wall-wetting sprinklers with windows that are permanently fixed in the closed position or automatic closing; or (ii) Fixed fire windows having an FRL --/60/--; or (iii) Automatic closing fire shutters achieving an FRL --/60/-- <p><input type="checkbox"/> <u>Doorways</u></p> <ul style="list-style-type: none"> (i) External wall-wetting sprinklers used with doors that are automatic or self-closing; or (ii) Fire doors having an FRL of --/60/30 that are self-closing or automatic closing.
C3.5	<p>As discussed in C2.2 and C2.7 above a fire wall needs to be introduced at the lower ground floor level to divide the building into two separate compartments and any opening located within this wall is be a self-closing fire door which achieves an FRL of --/120/30.</p>
C3.10	<ul style="list-style-type: none"> (i) The doorways providing access to the lift shaft shall be protected by --/60/-- fire doors complying with AS1735.11-1986 and remain closed except when discharging or receiving passengers or goods; and (ii) Any lift call button, indicator panel or other panel located within the wall of the fire-isolated lift shaft must be backed by construction having an FRL of --/60/60 if it exceeds 35,000mm² in area.
Cl. C3.12	<p>Where a service passes through a floor required to achieve an FRL, that service is required to be protected by either a shaft which has been construction in accordance with BCA Spec C1.1 (listed above) or in accordance with C3.15 (see below).</p>

Cl. C3.13	<p>Any opening in a wall providing access to a ventilating, pipe, garbage or other service shaft must be protected by one of the following methods -</p> <ul style="list-style-type: none"> (i) If it is in a sanitary compartment – a door or panel which together with its frame is non-combustible or has an FRL of not less than --/30/30; or (ii) A self-closing --/60/30 fire door or hopper; or (iii) An access panel having an FRL of not less than --/60/30; or (iv) If the shaft is a garbage shaft the door or hopper is to be of non-combustible construction.
Cl. C3.15	Any opening(s) for service(s) (electrical, mechanical, plumbing, etc) that penetrate a building element which is required to be of fire-resisting construction is required to be protected (i.e. fire seal).
Cl. C3.16	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 AS1530.4-2005 to achieve the required FRL.
Cl. C3.17	Where a column protected by lightweight construction to achieve the required FRL defined by BCA Spec C1.1 (listed above) passes through a building element that is also required to have an FRL it must be installed using a method and materials identical with the prototype assembly of the construction which has achieved the required FRL.

4.4 Section D – Access & Egress

Cl. D1.3	<p>Currently, the subject building is not protected with a sprinkler system, therefore the maximum number of storeys a stairway can connect / be open is two (2). With respect to this the following points are made –</p> <p><input type="checkbox"/> <u>Lobby Stair</u></p> <p>It connects five (5) levels and therefore is required to be located within a fire-isolated shaft. The enclosure of the stair within such as shaft detracts from the design intent which was for the stairway to be separated from the remainder of the building, however the separation would be via the use of glazing and / or the provision of a sprinkler system throughout the building.</p> <p>The use of glazing to enclose the stairway is possible, however compliance would need to be demonstrated via a performance-based approach.</p>
Cl. D1.6	The path of travel to an exit and any required exit is to have an unobstructed height throughout of not less than 2m (except a doorway, which can be 1980mm) and an unobstructed width not less than 1m (except a doorway, which can be 750mm in an area

not required to be accessible and 850mm in an area required to accessible).

Cl. D1.7 Refer to D1.3 above.

Cl. D1.10 For compliance to be determined with this clause this office requires the proposed landscaping drawings which include provision of hardscape areas (pathways and the like).

Once received, this office will provide advice relating to the –

- (i) Required widths of external pathways; and
- (ii) Which external pathways need to be accessible for the purpose of persons with a disability.

Cl. D1.13 Reference should be made to the projected / proposed occupant loads detailed within Section 2.3.

The client / end user is to provide confirmation that the numbers specified are true and correct.

Cl. D1.17 Access into the lift pit must be through the lift landing doors provided on the lowest level.

Cl. D2.2 Stair 1 is to be constructed in accordance with the following –

- (i) Be of non-combustible materials;
- (ii) Designed so that if there is a local failure it will not cause structural damage to, or impair the fire-resistance of the shaft.

Cl. D2.7 Gas or other fuel services must not be installed within the required exit.

Any services or equipment (being electrical meters, distribution boards or the like) installed within the path of travel are to be enclosed by non-combustible construction or a fire-protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure.

Cl. D2.13 The going, riser and steepness dimension of the stairways must be designed within the following range.

RISER (R)		GOING (G)		SLOPE RELATIONSHIP (2R+G)	
Max	Min	Max	Min	Max	Min
190	115	355	250	700	550

The risers and goings are to be constant throughout the flight and the stair treads must also have a surface or nosing strip achieving a slip-resistance classification of P3 in dry and P4 in the wet tested in accordance with AS4586-2013.

Cl. D2.14	<p>Stair landings are to be a minimum of 750mm long and have a non-slip finish and a gradient not steeper than 1:50.</p> <p>The surface or strip must achieve a slip-resistance classification of P3 in dry and P4 in wet tested in accordance with AS4586-2013.</p>
Cl. D2.15	<p>❑ <u>Internal Doorways</u></p> <p>(i) The threshold of any doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf.</p> <p>❑ <u>External Doorways</u></p> <p>(ii) The threshold of the external doorways leading from the foyer on ground floor & lower ground floor must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf great than 50mm; and</p> <p>(iii) All other doorways can incorporate a step or ramp 190mm above the finished surface of the ground, this includes the balconies.</p>
Cl. D2.16	<p>Balustrades must be constructed as follow -</p> <p>(i) To a height not less than 865mm above the nosings of the stair treads or the floor of a ramp and to a height of 1000mm above the floor of any access path, balcony, landing or the like;</p> <p>(ii) Any opening does not permit a 125mm sphere to pass through it and for stairs, the space is measured above the nosings;</p> <p>(iii) For floors more than 4000mm above the surface beneath, any horizontal or near horizontal elements between 150mm and 760mm must not facilitate climbing; and</p> <p>(iv) For balustrades in fire isolated stairways used primarily for emergency purposes openings between balustrades can be up to 300mm; or where rails are used, the bottom rail must be a maximum of 150mm above the stair nosings line or from the landing floor and the opening between rails must not be more than 460mm.</p>
Cl. D2.17	<p>Handrails must be fixed at a height of not more than 865mm measured above the nosings of the stair treads, ramp or landing and shall be continuous such that no obstruction on or above them will tend to break a hand hold.</p>

Cl.
D2.21

Be advised that due to the building having a multitude of users, specific door hardware requirements are applicable for each use, these are detailed below –

□ Lower Ground Floor

- (i) Any door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily operable without a key from the side that faces a person seeking egress; and
- (ii) By a single hand pushing or downward action on a single device located between 900mm and 1100mm from the floor and
 - Be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch; and
 - Have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35mm nor more than 45mm; or
- (iii) A single hand pushing action on a single device which is located between 900mm and 1.2m above the floor; or
- (iv) Alternatively, any door in a required exit, forming part of a required exit or in the path of travel to a required exit must be fitted with a fail-safe device which automatically unlocks the door upon the activation of any detector system deemed suitable in accordance with AS1670.1-2004 installed throughout the building.

Furthermore, It is recommended that a door schedule be provided to this office for review.

□ Ground Floor & Level 1

The following doorways relate to any doorway used by the public, this includes the sanitary compartments located on the ground floor.

- (i) If a door is secured, then the device on the door operating either the latch or bolts must be panic bar;
- (ii) Panic bars may be omitted to main entrance doorways provided the doors are fitted with key-operated fastenings only, the tongues of which must be locked in the retracted position whenever the building is occupied by the public so the door can yield to pressure from within.

<p>Cl. D2.23</p>	<p>Self-closing fire doors to the fire-isolated exits, (stairs and passageways), must be provided with signage stating, "FIRE DOOR – DO NOT OBSTRUCT – DO NOT HOLD OPEN", on the side of the door that faces a person seeking egress.</p> <p>The smoke doors provided in public corridors must also be provided with signs as above, on both sides.</p> <p>Automatic fire or smoke doors held open by automatic hold open devices must be provided with signage stating, "FIRE DOOR – DO NOT OBSTRUCT" on either both sides of the doorway or the wall adjacent to the doorway.</p> <p>Doors discharging from fire-isolated exits must be provided on each side with signage stating, "FIRE SAFETY DOOR – DO NOT OBSTRUCT".</p> <p>In each instance, the lettering must not be less than 20mm high and be in a colour that contrasts with the background.</p>
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4.5 Section E – Services & Equipment

<p>Cl. E1.3</p>	<p>A fire hydrant system complying with AS2419.1-2005 is required to serve the building.</p> <p>It is requested that the proposed location of the fire hydrant booster assembly be shown on the architectural drawings to assist in determining compliance with location / position.</p>
<p>Cl. E1.4</p>	<p>A fire hose reel system complying with AS2441-2005 is required to serve any part of the building which is not a classroom or the like.</p>
<p>Cl. E1.5</p>	<p>Advice regarding Wilkinson House and whether it will be sprinkler protected, it is noted that Joan Freeman Science and The Technology building are sprinkler protected.</p> <p>In the event Wilkinson House is not sprinkler protected then it will need to be separated from Joan Freeman Science and The Technology building with a fire wall which achieves an FRL of not less than 120/120/120.</p>
<p>Cl. E1.6</p>	<p>Portable fire extinguishers complying with AS2444 are required to be provided throughout the building.</p> <p>Public corridors serving the units must be provided with powder (ABE) type fire extinguishers, with a minimum size of 2.5kg and distributed to only serve the storey where they are located and so that there is 10m maximum distance from the unit doorway to the nearest extinguisher.</p>

Cl. E2.2	<p>The following smoke hazard management systems are required –</p> <ul style="list-style-type: none"> (i) An automatic smoke detection and alarm system complying with BCA Spec E2.2a; or (ii) A sprinkler system complying with BCA Spec E1.5; and (iii) The air-handling system must automatically shut down on the activation of an automatic smoke detection and alarm system complying with Clause 5 of Specification E2.2a of the BCA & AS1670.1-2004 and any other installed fire detection and alarm system, including a sprinkler system complying with Specification E1.5 of the BCA.
Cl. E3.1	The electric passenger lift installation or an electrohydraulic passenger lift installation shall comply with this clause.
Cl. E3.2	Subject lifts need to be able to accommodate a stretcher, hence they need to have a clear space not less than 600mm wide x 2000mm long x 1400mm above the floor level.
Cl. E3.3	Warning signage "DO NOT USE LIFTS IF THERE IS A FIRE" will be required adjacent every lift call button with dimensions as detailed in this clause.
Cl. E4.2	Emergency lighting is required in accordance with AS2293.1-2005.
Cl. E4.5	Exit signage designed in accordance with AS2293.1-2005 must be provided above or adjacent to any external doorways and doorways leading to & from fire-isolated exits serving as required exits from the building.
Cl. E4.6	If an exit is not readily apparent to persons occupying or visiting the building, then exit signs complying with AS2293.1-2005 must be installed in appropriate positions in corridors, hallways, lobbies and the like, indicating the direction to a required exit.
Cl. E4.9	A sound system and intercom system for emergency purposes complying with AS1670.4-2004 is required to serve the building.

4.6 Section F – Health & Amenity

Cl. F1.0	A test report from a Registered Testing Authority must be provided to certify that the façade / external walls achieve compliance with BCA FP1.4 and FV1.
Cl. F1.1	Stormwater drainage must comply with AS/NZS3500.3-2003.
Cl. F1.4	Waterproofing membranes for external above ground use (i.e. balconies and roof) must comply with AS4654-2012.
Cl. F1.5	Metal roof sheeting must comply with AS1562.1-1992.
Cl. F1.6	Any Sarking-type materials used for weatherproofing of roofs and walls must comply with AS/NZS4200-1994.

Cl. F1.7	Building elements in wet areas must be water-resistant or waterproof in accordance with Table F1.7 and comply AS 3740-2010.
Cl. F1.9	Damp-proof courses must consist of a material complying with AS/NZ2904-1995 or an impervious termite shield complying with AS3660.1-2000.
Cl. F1.10	A floor laid directly onto ground or fill must be provided with a vapour barrier complying with AS2870-2011.
Cl. F1.13	Refer to B1.4 (above) for glazing requirements.
Cl. F2.3	Compliance with respect to sanitary facilities cannot be determined until the additional information requested is provided.
Cl. F2.5	<p>(i) The door to a full enclosed sanitary compartment must –</p> <ul style="list-style-type: none"> ▪ Open outwards; or ▪ Slide; or ▪ Be readily removable from the outside of the sanitary compartment (i.e. lift-off hinges) <p>Unless there is a clear space of at least 1.2m between the closet pan within the sanitary compartment and the hinge side edge of the doorway.</p> <p>(ii) The doors and partitions that separate adjacent sanitary compartments must extend 1.8m above the floor.</p>
Cl. F3.1	<p>Unobstructed ceiling heights throughout the building must not be less than the following –</p> <ul style="list-style-type: none"> (i) Public corridors, classrooms, lecture theatre and the like – 2.7m; and (ii) Offices and the like – 2.4m; and (iii) Sanitary facilities and the like – 2.1m; and (iv) Stairways, ramps and landings – 2.0m.
Cl. F4.4	Where complaint natural lighting is not provided, artificial lighting is to be installed in accordance with AS/NZS1680.0-2009.
Cl. F4.5	<p>Any habitable room, sanitary compartment, bathroom, laundry and any other room occupied by a person for any purpose must have either –</p> <ul style="list-style-type: none"> (i) Natural ventilation (i.e. opening(s) having an openable area of 5% of the room being served); or (ii) Mechanical ventilation complying with AS1668.2-2012.

4.8 Section G – Ancillary Provisions

Cl.
G1.101

The windows located 3 or more storeys above the street level shall be able to be cleaned from wholly within the building or by a method complying with Occupational Health and Safety Act 2000 and Regulations made under the Act.

Report By



Luke Sheehy
Principal
For Design Confidence (Sydney) Pty Ltd

Verified By



Nicolas Hurtado
Associate
For Design Confidence (Sydney) Pty Ltd

APPENDIX 1

1. The BCA Design Assessment was based upon the Architectural documentation prepared by TKD Architects, namely –

DESCRIPTION	DRAWING NUMBER	REVISION	DATE
Cover Sheet & Drawing Schedule	AR.MP.0000	P4	28.09.2018
Existing Site Plan	AR.MP.1101	P4	28.09.2018
Proposed Site Plan	AR.MP.1102	P4	28.09.2018
GFA Tables	AR.MP.1103	P4	28.09.2018
Existing & Demolished GFA Plan	AR.MP.1104	P4	28.09.2018
Existing Site Plan Level 1	AR.MP.2001	P4	28.09.2018
Existing Site Plan Level 2	AR.MP.2002	P4	28.09.2018
Existing Site Plan Level 3	AR.MP.2003	P4	28.09.2018
Existing Site Plan Level 4	AR.MP.2004	P4	28.09.2018
Existing Site Plan Level 5	AR.MP.2005	P4	28.09.2018
Existing Site Plan Level 6	AR.MP.2006	P4	28.09.2018
Existing Site Plan Level 7	AR.MP.2007	P4	28.09.2018
Existing Roof Plan	AR.MP.2008	P4	28.09.2018
Proposed Masterplan Envelope Level 1	AR.MP.2101	P4	28.09.2018
Proposed Masterplan Envelope Level 2	AR.MP.2102	P4	28.09.2018
Proposed Masterplan Envelope Level 3	AR.MP.2103	P4	28.09.2018
Proposed Masterplan Envelope Level 4	AR.MP.2104	P4	28.09.2018
Proposed Masterplan Envelope Level 5	AR.MP.2105	P4	28.09.2018
Proposed Masterplan Envelope Level 6	AR.MP.2106	P4	28.09.2018
Proposed Masterplan Envelope Level 7	AR.MP.2107	P4	28.09.2018
Proposed Masterplan Envelope Roof Level	AR.MP.2108	P4	28.09.2018
Demolition Plan Level 1	AR.MP.2201	P4	28.09.2018
Demolition Plan Level 2	AR.MP.2202	P4	28.09.2018
Demolition Plan Level 3	AR.MP.2203	P4	28.09.2018
Demolition Plan Level 4	AR.MP.2204	P4	28.09.2018
Demolition Plan Level 5	AR.MP.2205	P4	28.09.2018
Demolition Plan Level 6	AR.MP.2206	P4	28.09.2018
Demolition Plan Level 7	AR.MP.2207	P4	28.09.2018
Existing Elevations	AR.MP.3001	P4	28.09.2018
Proposed Masterplan Envelope Elevations	AR.MP.3002	P4	28.09.2018
Proposed Masterplan Envelope Sections 1	AR.MP.4001	P4	28.09.2018
Proposed Masterplan Envelope Sections 2	AR.MP.4002	P4	28.09.2018

DESCRIPTION	DRAWING NUMBER	REVISION	DATE
Masterplan 3D views	AR.MP.7001	P4	28.09.2018
Wilkinson House Redevelopment Basement Plan	AR.DA.2001	P4	28.09.2018
Wilkinson House Redevelopment Ground Plan	AR.DA.2002	P4	28.09.2018
Wilkinson House Redevelopment Level 1 Plan	AR.DA.2003	P4	28.09.2018
Wilkinson House Redevelopment Level 2 Plan	AR.DA.2004	P4	28.09.2018
Wilkinson House Redevelopment Level 3 Plan	AR.DA.2005	P4	28.09.2018
Wilkinson House Existing Basement Plan	AR.DA.2101	P4	28.09.2018
Wilkinson House Existing Ground Plan	AR.DA.2102	P4	28.09.2018
Wilkinson House Existing Level 1 Plan	AR.DA.2103	P4	28.09.2018
Wilkinson House Existing Level 2 Plan	AR.DA.2104	P4	28.09.2018
Wilkinson House Existing Elevations	AR.DA.3002	P4	28.09.2018
Wilkinson House Existing redevelopment Elevations	AR.DA.3001	P4	28.09.2018

2. The BCA Design Assessment was based upon the following additional information

TITLE	PREPARED BY	REFERENCE	DATE
SCEGGS Darlinghurst – Options Study	Design Confidence	P218_153	11.09.2018

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