UNSW AUSTRALIA

UNSW Biological Sciences Project
Stage 2
Volume 12: Building Code Report

Design Development Report
BS2-LT161026

October 2016
Revision 0
Prepared for Multiplex

MULTIPLEX

PLANNING BUILDING HERITAGE URBAN DESIGN CITY PLAN SERVICES

19 October 2016

Our Ref: 152911

Dawn Carroll
Brookfield Multiplex Australasia
GPO Box 172, Sydney NSW 2001

Dear Mrs Carroll,

RE: BUILDING CODE OF AUSTRALIA ASSESSMENT
BIOLOGICAL SCIENCES PROJECT, BUILDING D26 STAGE 2 SSD APPLICATION (7865)

1. INTRODUCTION

1.1 General

The proposed development subject to this report is located at the Kensington Campus of the University of NSW.

The subject property is located within the local government area of the Randwick Council.

1.2 Description

The proposal is for the refurbishment of the internal spaces of Building D26 which currently houses the existing UNSW Schools of BEES and BABS. The schools will be decanted into a combination of the consented Building E26 which is currently in construction due for completion in May 2017, and the existing Biolink building. Once decanted, Building D26 is proposed to be partially demolished retaining the existing concrete structure and construction of a new facade and internal spaces. The SSD application is for the internal spaces on Lower Ground Floor and Levels 1 to 6. The Ground Floor is covered under the Stage 1 SSD and a separate application (S96) is made for amendments to the layout (not the subject of this BCA report). The façade is also subject t to the Section 96 application.

On completion, Building D26 will be connected to the Biological Sciences Stage 1 Building E26 (which is currently under construction) to the extent that both building parts will be one building. The Biolink building which forms part of Building D26 will form part of the building but will be fire separated as a separate fire compartment from Building D26 & E26.

The D26 part building consists of:

Lower ground	Storage and plant
Ground floor (not part of this SSD)	Current approval – Retail Proposed Section 96 - Teaching, café, student centre and plant
Level 1 to 6	Labs, workspace and plant
Level 7 (not part of this SSD)	Plant
Level 8 (not part of this SSD)	Plant

1.3 Purpose of the Report

This report has been prepared, on behalf of Multiplex, to establish compliance to the Building Code of Australia and relevant Acts and Regulations of the development application documentation for the proposed work. The requirements in this report do not apply to the Biolink building, unless otherwise specifically stated.

1.4 Report Basis

This report is based on:

i. Architectural plans prepared by Woods Bagot, as identified in the attached Appendix 1

ii. The Building Code of Australia 2013, inclusive of NSW variations (See Note 1).

iii. Environmental Planning and Assessment Act 1979.

iv. Environmental Planning and Assessment Regulation 2000.

Notes (1) Building Code of Australia (BCA) 2013 was adopted in NSW on 1 May 2013.The amendment of the BCA, in the case of Crown Building work, at the date of invitations of tenders is the version called up by Clause 98 of the Environmental Planning & Assessment Regulation 2000 for the purpose of the building design.

1.5 Exclusions

This report does not consider the following except where specifically mentioned;

1) Structural design.

2) The Disability Discrimination Act 1992 (access for people with disabilities has been assessed in accordance with Part D3 of the BCA, however additional measures may be required to be provided subject to the Disability Discrimination Act 1992)

3) Disability (Access to Premises – Building) Standards 2010.

2. BUILDING DESCRIPTION

2.1 The building classifications relevant to the proposed use are:

(a) LGF – 7b storage & plant

(b) Ground floor (not part of this SSD) – Class 6 retail (current approval); Class 6 café, Class 9b teaching & student centre & Class 8 laboratories (proposed Sec 96)

(c) Level 1 to 6 – Class 8 labs and Class 5 office

(d) Level 7 (not part of this SSD) – Class 8 (ancillary)

(e) Level 8 (not part of this SSD) – Class 8 (ancillary)

2.2 The building has an effective height of more than 25 m.

2.3 The required type of construction under BCA C1.1 is Type A.

3. STRUCTURAL PROVISIONS

3.1 The proposed structural elements are required to be designed in accordance with BCA Section B (Class 2 & 7 building) and the relevant standards.

3.2 Termite risk management is required in accordance with this section and AS 3660.1-2000 or AS 3660.1-2014.

3.3 Glazing is to comply with AS 2047-2014 and AS 1288-2006 Amdt 1 & 2, as relevant.

3.4 A certificate from a structural engineer will be required certifying that:

(a) the structural capacity of the existing building is appropriate for the use; and

(b) the structural capacity of the existing building will not be reduced.

Upgrade of the existing structure to comply with current BCA structural requirements is not proposed.

4. FIRE RESISTANCE

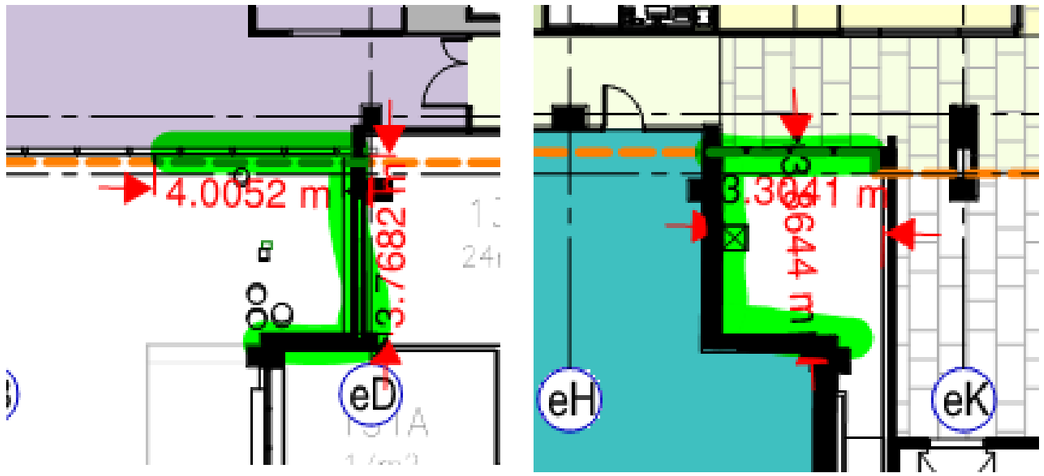
4.1 The FRLs of the existing structure (floors, external walls, internal walls required to be fire rated, columns, roof) are to be assessed by a structural engineer to determine FRL achieved. Any non-compliances with current BCA (4 hrs fire resistance) are to be upgraded or **performance justified.**

4.2 Compartmentation sizes are increased further beyond BCA DTS limits of 5,000 m² and 30,000 m³. Ground floor to Level 6 Biological sciences building plus D26 (excluding Biolink) will have a fire compartment of approximately 25,948 m². **Performance justification** is required. The Biolink will be a separate fire compartment to D26 and the Biological Sciences building.

4.3 The Lower Ground Floor of Building D26 is to be fire separated from Lower Ground Floor of Building E26 to facilitate travel distances (refer to Part 5.9 below identifying horizontal exit in fire wall).

4.4 Biolink will continue to be fire separated from Building E26 & D26. Any deficiencies in the existing fire rated wall are to be rectified to comply, except that FRL can be reduced to 2 hrs in lieu of 4 hrs by **performance justification**.

External separation between Biolink and Building D26 is to be in accordance with BCA C3.3, i.e. external fire rated wall (60/60/60) and/or sprinkler (internal) protected fixed closed glazing, unless **performance justified.**



Fire separation between Building E26 and the Biolink Building has been dealt with under the Building E26 approval.

4.5 Internal loadbearing walls must be concrete or masonry.

4.6 Lightweight fire resisting construction is to comply with BCA C1.8.

4.7 Fire Hazard properties of any material or assembly used in the building are required to comply with C1.10 and Specification C1.10 of the BCA.

4.8 The lift shafts are required to be fire rated in accordance with BCA C2.10 and Spec C1.1 Table 3.1. Openings in lift shafts are have the fire rating specified in BCA C3.10.

4.9 The east and west stairs are required to be to be fire isolated stairs. New fire doors are proposed to be provided to the fire stairs to preplace existing doors. Doors to fire isolated stairs are to have the fire rating specified in BCA C3.8. Fire isolated stairs are only to be penetrated by services permitted by BCA C3.9.

4.10 Openings for service penetrations in fire rated building elements are to be fire stopped/protected in accordance with BCA Clause C3.15.

4.11 The top of the fire stairs are to be enclosed in construction having an FRL not less than 120/120/120 from both sides.

4.12 Fire separation between Building D26 and E26 at Lower Ground Floor is to be maintained and continued around the new main stores room.

4.13 Automatic closing fire doors are to comply with C3.5, C3.7 & C3.8, as relevant, particularly in relation to smoke detectors on each side of the door.

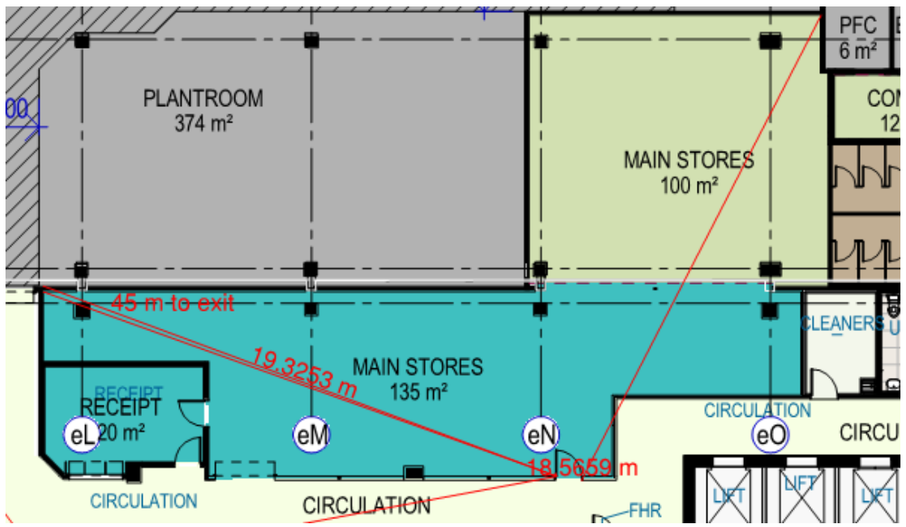
5. ACCESS AND EGRESS

5.1 The fire engineer is to review the existing FER for the Wallace Wurth building to ensure that proposed works do not adversely affect the existing FER.

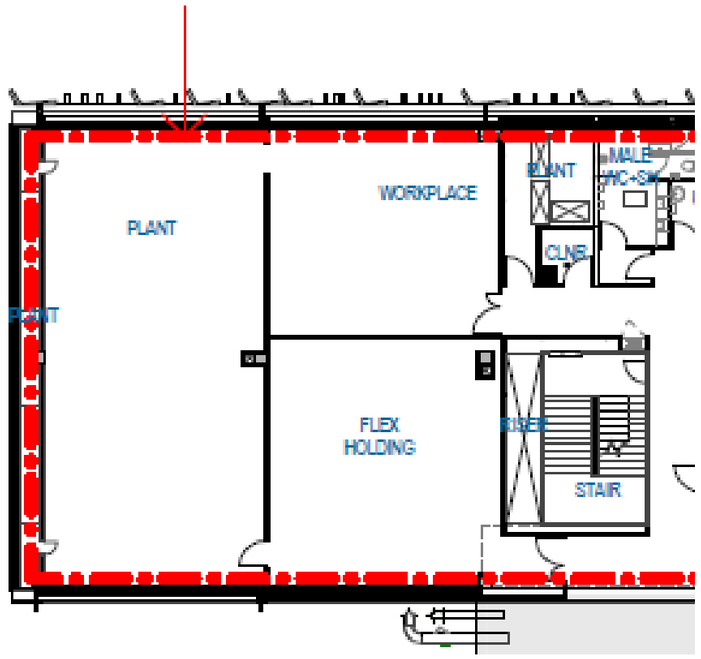
5.2 Note that egress from the Wallace Wurth East wing L7 plant room appears to rely on egress to D26 roof top (refer to point 8.4 of Wallace Wurth FER) from which there is access to the existing D26 east fire stair. Such egress is to be maintained and identified on the plans.

5.3 The following areas are more than 20 m to a point of choice and **performance justification** is required:

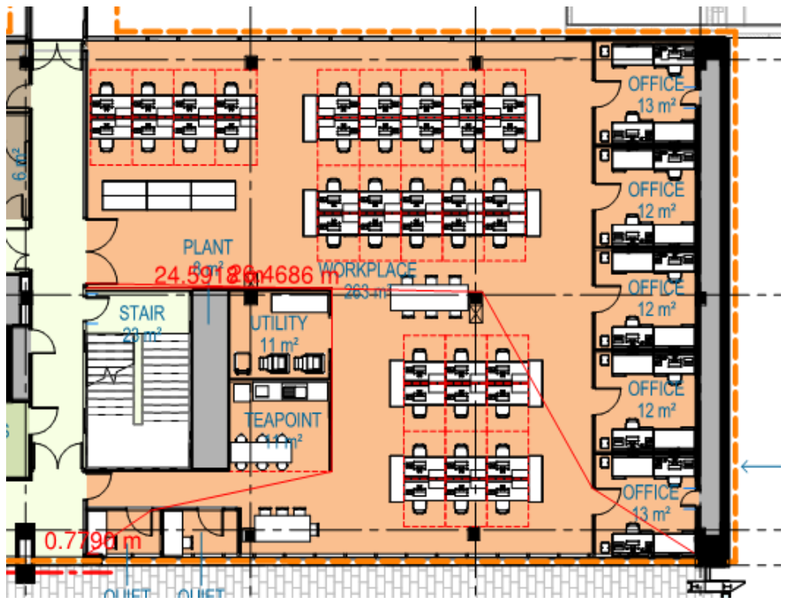
(a) LGF main stores – 19.3 m (more than 20 m if racking provided)



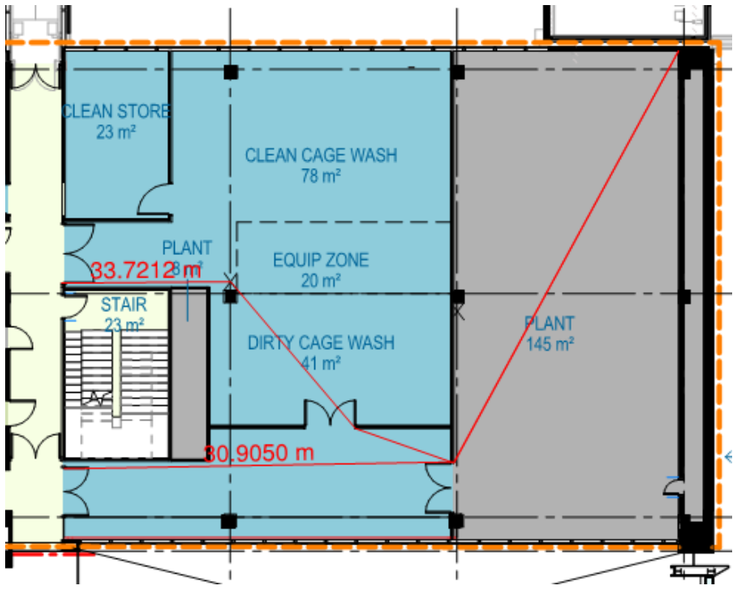
(b) Level 6 west plant room - 27 m.



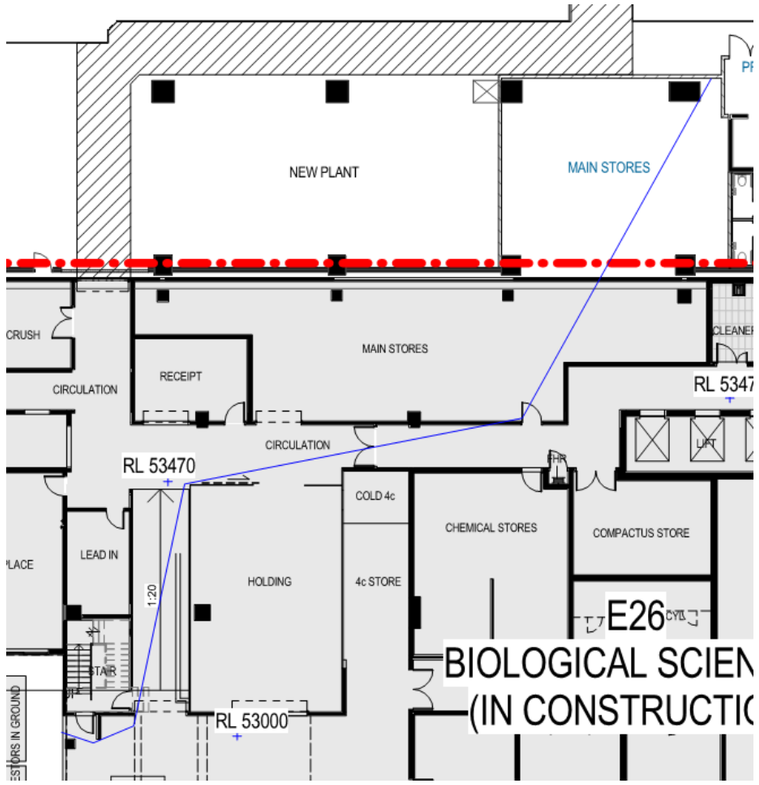
(c) Level 2, 3, 4, & 5 east and west workplace – 26.7 m



(d) Level 6 east plant – 33.7 m open floor plan and if not traveling through atrium.

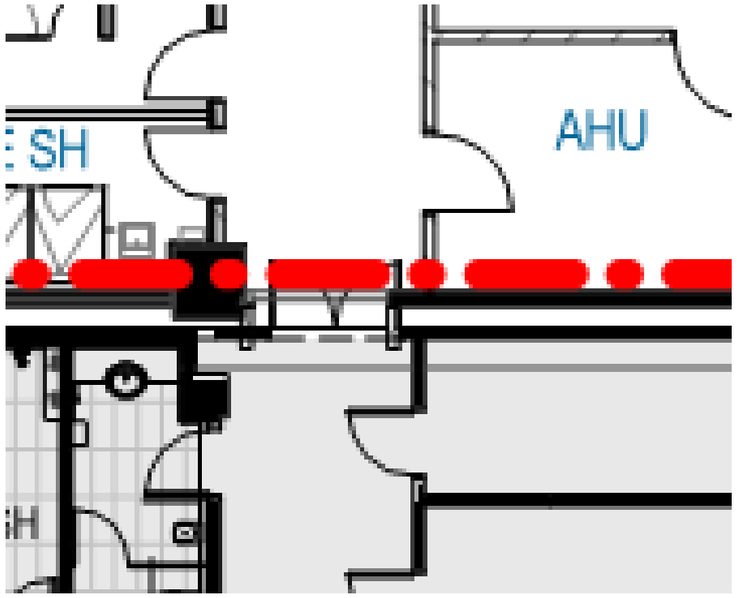


5.4 The LGF main stores room is 51 m from the nearest exit. **Performance justification** is required.



5.5 The **fire engineer** is to advise if any of the alternative solutions in the existing Building E26 Sciences Building FER that are impacted by the connection to Building D26.

5.6 The LGF door between Building D26 and E26 at eastern end has been assessed as a horizontal exit from the D26 side. The double door is to be redesigned to swing into Building E26.

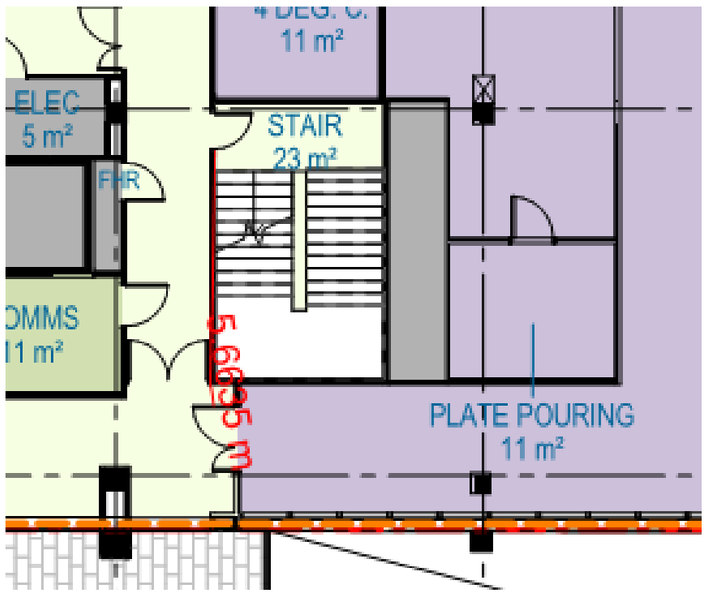


5.7 The following exits are more than 60 m apart and performance justification required:

(a) LGF D26 west stair to east horizontal exit – 71 m.

(b) L1, 2, 3, 4, 5 & 6 west exit to east exit – 61.5 m.

5.8 The location of the access door into Wet Teaching Lab 09 on Level 1, from the atrium, is to be located minimum 6 m from the entry door to the fire stair.



5.9 The following population and exit widths have been determined:

Table 1: Exit widths

LEVEL	POPULATION	REQUIRED EXIT WIDTH	AVAILABLE EXIT WIDTH (AGGREGATE)
LGF D26	46	2 m	2 m
GF D26, E26 & Biolink (proposed Sec 96 scheme)	515 served by common exits (rooms having direct egress to outside have not been counted)	5 m	5 m minimum
Level 1 D26, E26 & Biolink	640 persons	6 m	6 m
Level 2 to 5 (each level) D26 & Biolink	170 persons	2 m	3 m
Level 6 D26	40 persons	2 m	2 m

5.10 Installations in exits and paths of travel are to comply with BCA D2.7.

5.11 Goings and risers are required to be upgraded to comply with D2.13 of the BCA and landings must comply with BCA D2.14.

5.12 Barriers to prevent falls are to be provided in accordance with BCA D2.16. The existing balustrades in the stairs do not comply. Existing non-compliances are to be upgraded to comply.

5.13 Handrails are to be provided to stairs and ramps in accordance with BCA D2.17. Existing non-compliances are to be upgraded to comply.

5.14 The stairs are to be upgraded to comply with current BCA standards. This includes re-entry provisions, contrasting non-slip nosings, and statutory signage. The D26 fire stairs are to have automatic closing doors (doors normally held open and released on fire trip). On this basis, the stair is to comply with the requirements for a non-fire isolated stair in relation to balustrades and tactile indicators.

5.15 Door hardware is to comply with BCA D2.21.

5.16 Signage is required to fire stair doors in accordance with BCA D2.23.

5.17 Protection of openable windows is to be designed to comply with BCA D2.24.

6. ACCESS FOR PEOPLE WITH DISABILITIES

6.1 Access for people with disabilities is required in accordance with Part D3 & AS1428.1.

6.2 Ensure that all doors have 850 mm clear width for one door leaf.

6.3 Access signage is to be provided in accordance with BCA D3.6 including signage to exit doors.

6.4 On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.

7. SERVICES AND EQUIPMENT

7.1 Fire safety services must be integrated with E26 building, as one building.

7.2 The Biolink Building will be assessed as the same building as D26/E26 and will not be upgraded. The following matters need to be addressed by **performance justification:**

(a) Refer to comments under Part 9.2 of this report regarding fire separation.

(b) Services non- compliances as a result of Biolink systems not complying as if Biolink was the same building as D26/E26, such as:

(i) location of hydrant booster serving Biolink being separate from D26/E26;

(ii) FIP being separate panel to D26/E26

(iii) any other similar non-compliances identified by service consultants.

7.3 The hydrant system is to be upgraded to comply with current standards. The booster must be integrated with the Biological Sciences Building E26 booster, in the same location. The location of the booster is to be **performance justified.**

7.4 Upgrade FHR's to current standards.

7.5 Portable fire extinguishers must be provided in accordance with BCA clause E1.6 and AS2444-2001.

7.6 Upgrade sprinkler system to current standards. The booster must be integrated with the Biological Sciences Building (E26) booster, in the same location.

7.7 The following smoke hazard management and other measures (BCA E2.2) are required in D26:

- Pressurisation of fire isolated stairs
- Zone smoke control
- AS1670 smoke detection (G3.8)
- Smoke exhaust is required from any fire compartment over 2000 m² and containing Class 9b (school) parts. (Note: The Teaching labs and associated prep area, as classrooms, do not required smoke exhaust)
- Refer to Part 9.2 of this report regarding buildings containing atriums
- Shutdown of certain air-handling systems
- Smoke detection system for smoke control systems
- Building occupant warning system
- SSISES (EWIS)

7.8 Lifts are to comply with BCA Part E3.

7.9 Identify the two emergency lifts serving the whole building D26/E26.

7.10 Lift signage is to be upgraded to comply with BCA E3.3.

7.11 Emergency lighting must be provided in accordance with BCA Part E4 & AS 2293.1-2005.

7.12 Exit signs are required in accordance with BCA Part E4 and & AS 2293.1-2005.

7.13 A Sound System and Intercom System for Emergency Purposes is required in accordance with BCA E4.9.

8. HEALTH & AMENITY

8.1 Stormwater drainage must comply with AS/NZS 3500.3-2003.

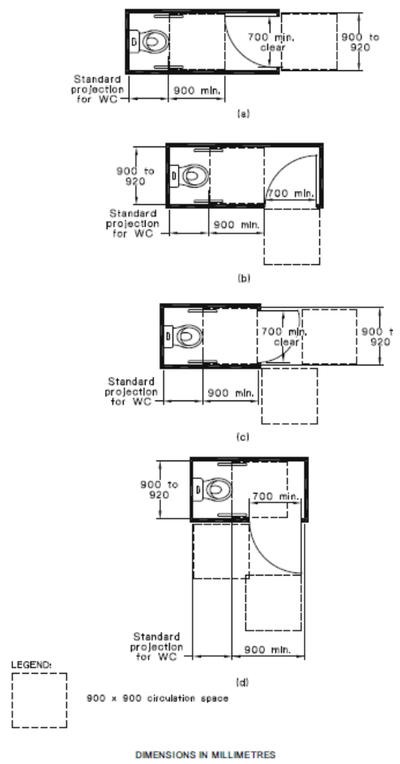
8.2 Waterproofing of wet areas must comply with BCA F1.7 & AS 3740.

8.3 Floor wastes are required in accordance with BCA F1.11.

8.4 Glazed assemblies in an external wall are to comply with AS 2047-2014.

8.5 Sanitary facilities are to be provided in accordance with BCA Part F2 except that **performance justification** is proposed so that students and staff facilities need not be separated.

8.6 Ensure that the circulation spaces required by AS 1428.1 are provided for the ambulant facilities as follows:



8.7 Light and ventilation is to comply with BCA Part F4.

8.8 Ceiling heights are to be in accordance with BCA Part F3.

8.9 Should the sanitary facilities at the eastern end contain an accessible facility:

(a) this accessible facility must be unisex (not male as currently marked); and

(b) the facilities for females must be ambulant facility.

9. ANCILLARY PROVISIONS (including atrium provisions)

9.1 A building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level. A building satisfies this requirement where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made thereunder

9.2 Building D26 is to contain the provisions required for atriums under BCA G3 unless **performance justified** including:

(a) G3.2 Dimensions of atrium well - **performance justification** required

(b) G3.3 & 3.4 Separating of atriums by bounding walls – to be **performance justified**

(c) G3.6 – Roof structure and membrane protected by sprinkler system

(d) Spec G3.8 clauses 2 sprinkler system – capable of complying except heat collector plates to be **performance justified**.

(e) Spec G3.8 Clause 3 Smoke control system will be **performance justified**

(f) Spec G3.8 Clause 4 automatic fire detection and alarm system in accordance with AS1670.1 and Clause 4 of spec G3.8, including break glass alarms.

(g) Spec G3.8 Clause 5 - Sound systems and intercom systems for emergency purposes - capable of complying except “EVACUATE” signage to be **performance justified**.

(h) Spec G3.8 Clause 6 Standby power system

(i) Spec G3.8 Clause 7 Stair pressurisation.

Any non-compliances with above systems for the Biolink building part are to be **performance justified**.

9.3 Atrium well is less than 6 m wide (BCA G3.2). **Performance justification** is required.

10. ENERGY EFFICIENCY

10.1 The new building work must be designed in accordance with energy efficiency measures as outlined in the NSW variation of the BCA Part J(A). It is not considered necessary that the existing building should be upgraded to comply with current BCA requirements for energy efficiency.

11. CONCLUSION

The proposed building works are capable of complying with the Building Code of Australia, and will be subject to construction documentation that will provide appropriate details to demonstrate compliance. This report has identified areas of non-compliance with the deemed-to-satisfy provisions and indicates the design intent to modify the design or demonstrate compliance with the Performance Requirements of the BCA. Whilst the performance based solutions are to be design developed, it is my view that the solutions will not impact on the current design.

Should you need to discuss any issues, please do not hesitate to contact the undersigned on 8270-3500.

Yours Faithfully,

Chris Michaels
Director

On behalf of City Plan Services

APPENDIX 1

Assessed plans prepared by Woods Bagot

Plan Title	Drawing No	Revision	Date
Cover Sheet	BS2-WB-AR-801	A	25/08/16
Site Plan	BS2-WB-AR-802	A	25/08/16
Floor Plan – Lower Ground	BS2-WB-AR-809	A	25/08/16
Floor Plan – Ground	BS2-WB-AR-810	A	25/08/16
Floor Plan – Level 1	BS2-WB-AR-811	A	25/08/16
Floor Plan – Level 2	BS2-WB-AR-812	A	25/08/16
Floor Plan – Level 3	BS2-WB-AR-813	A	25/08/16
Floor Plan – Level 4	BS2-WB-AR-814	A	25/08/16
Floor Plan – Level 5	BS2-WB-AR-815	A	25/08/16
Floor Plan – Level 6	BS2-WB-AR-816	A	25/08/16
Floor Plan – Level 7	BS2-WB-AR-817	A	25/08/16
Floor Plan – Roof	BS2-WB-AR-818	A	25/08/16
Sections – 01	BS2-WB-AR-821	A	25/08/16