REF:03149-03BCA

PRELIMINARY
BUILDING CODE OF AUSTRALIA
REPORT

Cochlear Global Headquarters
Southern Precinct – Macquarie University Campus

Dated: May 2008

Prepared for: Tolland Williams

Prepared by: **McKenzie Group Consulting (NSW) Pty Ltd**
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Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Tolland Williams (refer appendix A) for compliance with the Building Code of Australia 2007.

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction certificate will need to include verification from a suitably accredited fire engineer: -

- Distance of Travel to exit (DP4).
- Maintenance of evacuation routes (EP2.2 & DP4)
- Reduced fire separation of the warehouse and office (CPI).
- Reduce fire resistance of elements of structure (CPI).
- Distance of travel between exits (DP4).

The fire engineered solution relating to the relevant category 2 items will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

The documentation will need further detailing such as door hardware, specifications, service design, as outlined in Appendix D of this report.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

Assessed By

Eric Bailey

1.0 Introduction

The proposed development comprises a six story commercial building with two basement carparks.

The site is located in the Southern Precinct, Macquarie University Campus.

2.0 Building Assessment Data

Summary of Construction Determination: -

Part of Project	**Building 1**
Classification	5 + 7a + 7b +8
Number of Storeys Contained	8
Rise In Storeys	7
Type of Construction	A
Effective Height (m)	<25m

Summary of the floor areas and relevant populations where applicable: -

Part of Project	**BCA Classification**	**Approx. Floor Area (m^2)**	**Approximate Volume (m^3)**	**Assumed Population**
Basement Level 1	7a	7300	Not assessed	Included
Ground Floor	7a + 7b	7000	Not assessed	60
First Floor to Sixth Floor	5 + 8	4600 x 6	Not assessed	460 per floor
Total		**41900**	**Not assessed**	**2820**

Notes:
1. The above populations have been base on the floor areas and calculations in accordance with Table D1.1.3 of the BCA.
2. The floor areas have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
3. The Carpark areas have been considered ancillary to the use for the purposes of population numbers

3.0 Fire Resistance

The buildings should be constructed generally in accordance with Clause & Table 3 of specification C1.1 of the Building Code of Australia 2005.

Fire resistance levels are proposed at 120 minutes via a performance based solution.

The building has been assessed on the basis of the following fire separation/ compartmentation within the development;

- DTS Provisions of the BCA.

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Lift motor rooms,
- Hydrant Pump rooms,
- Sprinkler Pump Rooms,
- Substation,

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes. Please note the electrical supply authority may require a 180 minute separation.

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to specification C1.10 & C1.10a Building Code of Australia.

4.0 Egress

The egress provisions form the proposed building are provided fire isolated stairways around the perimeter of the building. (generally)

The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths are not satisfied for all levels. The distance between exits when partitioned out may exceed 60m and it is recommended this be approached using the performance methodology of the BCA.

4.1 Access for Persons with a Disability

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2001. Access to the building appears satisfactory.

5.0 Fire Services & Equipment

The following fire services will need to be provided throughout the building:

- accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999, AS 2118.4-1995, AS 2118.6-1995 throughout the following areas – carpark only.
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-1994,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-1988,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1

A fire control centre is not required for this building.

6.0 Ventilation and Smoke Hazard Management

No additional requirements exist for a DTS complaint outcome.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 Building Code of Australia and AS 1668 and AS/NZS 3666.1.

7.0 Lift Services

The passenger lifts to be installed are to be : -

- fitted with warning signs, fire service controls in accordance with AS 1735.2
- Stretcher facilities not required as the building has an effective height less than 12m.
- Be provided with the following: -
  - A handrail in accordance with AS 1735.12
  - Minimum internal floor dimensions as specified in AS 1735.12,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12

8.0 Sanitary Facilities

Satisfactory sanitary & other facilities within the development consist of: -

Class	Occupant Number			WC	Urinal	Basin
5		Male		65	39	39
		Female		91		39
		Unisex Wheel Chair Accessible		13	13	13
	Sub-Total Required			**169**	**52**	**91**

9.0 Sound Transmission & Insulation

Not applicable to a Class 5 building.

10. Energy Efficiency

The proposed development shall be provided insulation Building sealing and services in accordance with NSW Part J of the BCA 2004. Assessment has been carried out by Hyder Consulting and will form part of the construction certificate documentation.

Appendix A- Design Documentation

The following documentation was used in the assessment and preparation of this report: -

DRAWING NO.	Title	Issue	Drawn By
A01	Drawing Schedule + Location Plan	02	Tolland Williams
A02	Site Plan	02	Tolland Williams
A03	Basement Level B1 Floor Plan	02	Tolland Williams
A04	Lower Ground Floor Plan	02	Tolland Williams
A05	Ground Floor Plan	02	Tolland Williams
A06	Level 1 Floor Plan	02	Tolland Williams
A07	Level 2 Floor Plan	02	Tolland Williams
A08	Level 3 Floor Plan	02	Tolland Williams
A09	Level 4 Floor Plan	02	Tolland Williams
A10	Level 5 Floor Plan	02	Tolland Williams
A11	Level 6 Floor Plan (plant/ roof level)	02	Tolland Williams
A12	Plantrooms Roof Plan	02	Tolland Williams
A13	Elevations North and South	02	Tolland Williams
A14	Elevations East and West	02	Tolland Williams
A15	Sections A & B	02	Tolland Williams
A16	Sections C & D	02	Tolland Williams
A17	Sections E & F	02	Tolland Williams
A18	Section G	02	Tolland Williams
A19	Shadow Diagrams	02	Tolland Williams

Appendix B- Draft Fire Safety Schedule

	Items to be inspected or tested as nominated by the relevant authority	Deemed to satisfy installation standard/code/conditions of approval
1.	Access Panels, Doors and Hoppers	BCA Clause C3.13
2.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.6 – 1995 (Combined sprinkler & hydrant)
3.	Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
4.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 1998
5.	Exit Signs (non-illuminated)	BCA Clause E4.7
6.	Fire Dampers	BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990
7.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 1997
8.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 1988
9.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 1994
10.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
11.	Paths of Travel	EP&A Reg 2000 Clause 186
12.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
13.	Wall-Wetting Sprinklers	BCA Clause C3.4 & AS 2118.2 – 1995
14.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 1997, BCA Clause C3.6, D2.23, E3.3 & H101.8

Appendix C- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2004:

Table 3

TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

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

Table 3.9 **REQUIREMENTS FOR CARPARKS**	
Building element	**FRL** (not less than) ***Structural adequacy/ Integrity/Insulation*** **ESA/M** (not greater than)
Wall	
(a) *external wall*	
(i) less than 3 m from a *fire-source feature* to which it is exposed:	
Loadbearing	60/60/60
Non-*loadbearing*	-/60/60
(ii) 3 m or more from a *fire-source feature* to which it is exposed	- / - / -
(b) *internal wall*	
(i) *loadbearing*, other than one supporting only the roof (not used for carparking)	60/ - / -
(ii) supporting only the roof (not used for carparking)	- / - / -
(iii) non-*loadbearing*	- / - / -
(c) *fire wall*	
(i) from the direction used as a *carpark*	60/60/60
(ii) from the direction not used as a *carpark*	as *required* by Table 3
Column	
(a) supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed	- / - / -
(b) steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a *carpark*	60/ - / - or 26 m^2/tonne
(c) any other column not covered by (a) or (b)	60/ - / -
Beam	
(a) steel floor beam in continuous contact with a concrete floor slab	60/ - / - or 30 m^2/tonne
(b) any other beam	60/ - / -
Fire-resisting lift and stair shaft (within the *carpark* only)	60/60/60
Floor slab and vehicle ramp	60/60/60
Roof (not used for carparking)	- / - / -
Notes: 1. ESA/M means the ratio of exposed surface area to mass per unit length. 2. Refer to Specification E1.5 for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.	