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BCA Report

BUILDING CODE OF AUSTRALIA ASSESSMENT REPORT

Project: Tyree Energy Technologies Building, UNSW Kensington Campus
Client: Capital Insight Pty Ltd

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EXECUTIVE SUMMARY

The development, the subject of this report, is for the construction of a new building at the University of NSW Kensington Campus. The building is known as the Tyree Energy technologies building and will be used for teaching, laboratories and offices.

This report has been prepared, on behalf of Capital Insight Pty. Ltd. and others, to establish compliance to the Building Code of Australia and relevant Acts and Regulations of the development application documentation for the proposed works.

The following items are proposed to be dealt by justification against the performance requirements of the BCA in accordance with BCA Clause A0.5 (b).

Spec. C1.1, Clause 3.1 & C2.2, C2.7, C2.8 & C2.9	Deemed-to-satisfy requirements generally require 4 hrs fire resistance levels. Reduced fire resistance levels are proposed to be investigated.
D1.3	Level 5 is required to be served by two fire isolated exits in order to comply with the DTS provisions (D1.4) of the BCA. The second alternative exit from level 5 is proposed to be a stairway discharging onto Level 4.
D1.4	The following areas are more than 20 m to a point of choice: 1. The north eastern corner building on Level 1 to 3 is more than 20 m to a point of choice. 2. One of the Lower ground floor south east store room. 3. Level 4 north west store room. The building also contains areas that are more than 40 m to the nearest exit.
D1.5	The distance between alternative exits is more than 60 m from the north western and south western offices on Level 1 to 4.
E1.3	The hydrant booster does not comply with AS 2419.1 as it is not located adjacent to the principal vehicular access to the site.
E2.2	In the case where the fire compartment is more than 2,000 m², complying smoke exhaust is not proposed to be provided from the showcase function area.
G3.2, G3.3, G3.4 & G3.8	Atrium construction and services will not comply with the deemed-to-satisfy provisions.

The design as proposed is 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 that are intended to be addressed by Alternative Solution. Whilst these performance based solutions are to be design developed, it is our view that the solutions will not significantly impact on the current design.

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1.0 INTRODUCTION

1.1 General

The development, the subject of this report, is for the construction of a new building at the University of NSW Kensington Campus. The building is known as the Tyree Energy Technologies Building and will be used for teaching, laboratories and offices.

1.2 Description

The building will contain seven (7) storeys and have the following uses:

Basement:	Teaching, Plant
Ground:	Teaching, cafe loading dock and showcase function
Level 1 to 4:	Laboratory and offices
Level 5:	Plant

1.3 Purpose of the Report

This report has been prepared, on behalf of Capital Insight Pty. Ltd. and others, to establish compliance to the Building Code of Australia and relevant Acts and Regulations of the development application documentation for the proposed works.

1.4 Report Basis

This report is based on:

i. Architectural plans prepared by FJMT, as identified in the attached Appendix 1.
ii. The Building Code of Australia 2009, inclusive of NSW variations (See Note 1).
iii. Fire Engineering Review report prepared by Arup Ref 206715/90 Rev B, dated 06 November 2009
iv. Environmental Planning and Assessment Act 1979.
v. Environmental Planning and Assessment Regulation 2000.

Notes (1) Building Code of Australia (BCA) 2009 was adopted in NSW on 1 May 2009. The amendment of the BCA in force at the date of lodgement of a Construction Certificate is the version called up by Clause 98 of the Environmental Planning & Assessment Regulation 2000 for the purpose of the building design. Therefore comments may be subject to changes to comply with updated versions of the Building Code of Australia.

1.5 Exclusions

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

i. Structural design.
ii. The Disability Discrimination Act 1992 (refer to Accessibility report by Morris Goding).

2 BUILDING CODE OF AUSTRALIA DESCRIPTION

2.1 Classification (A3.2)

The proposed buildings consist of;

Lower ground: Class 9b school

Ground:	Class 9b school Class 6 cafe Class 7b loading dock
Level 1 to 4:	Class 8 Laboratory Class 5 Offices
Level 5:	Class 8 Ancillary Plant

2.2 Effective Height (A1.1)

The proposed building will have an effective height of less than 25 m.

2.3 Rise in Storeys (C1.2)

The proposed building will consist of a rise in storeys of six (6).

2.4 Type of Construction (C1.1)

Type A construction in accordance with Specification C1.1 of the BCA, is the applicable type of construction.

3 BUILDING CODE OF AUSTRALIA ASSESSMENT

3.1 Structure (BCA Section B)

BCA Clause	Title	Assessment and Comment	Status
B1.0 to B1.3	Actions and Loads	The building is required to be designed to the relevant structural standards outlined in this clause.	The proposed building is capable of complying
B1.4	Materials & forms of construction	The proposed materials and forms of construction are to be designed/selected to comply with the required Australian Standards. The structure is to be designed by a Structural Engineer in accordance with the standards required by this part. Glazed assemblies are required to be designed to comply with AS 2047and AS1288 as relevant. Timber primary building element are not proposed.	The proposed building is capable of complying

3.2 Fire Resistance (BCA Section C)

3.2.1 Fire Resistance and Stability (Part C1)

BCA Clause	Title	Assessment and Comment	Status
C1.1	Type of construction required	The type of fire resisting construction applicable is Type A construction. (Refer to Item 3.2.2 of this report – Specification C1.1 Fire-resisting Construction)	The proposed building is capable of complying
C1.2	Calculation in rise in storeys	The building has a rise in storeys of 5.	Note
C1.8	Lightweight construction	Any lightweight fire resisting construction is required to selected to comply with this clause.	The proposed building is capable of complying
NSW C1.10	Fire hazard properties	Materials are required to be selected to comply with the required fire hazard properties.	The proposed building is capable of complying
C1.11	Performance of external wall in fire	N/A	N/A

3.2.2 Fire-Resisting Construction (Specification C1.1)

BCA Clause	Title	Assessment and Comment	Status
2.2	Fire protection for support of another part	Elements which have an FRL and rely upon the direct vertical and/or lateral support from another element to maintain its FRL, the supporting part must have the same or higher level of fire resistance.	The proposed building is capable of complying
2.3	Lintels	Lintels are to have an FRL where required by this clause.	The proposed building is capable of complying
2.4	Attachment not to impair fire resistance	Attachments to fire rated external walls are to be of non-combustible construction.	The proposed building complies

BCA Clause	Title	Assessment and Comment	Status
2.6	Mezzanine floors: concession	Mezzanine floors are not proposed.	N/A
2.7	Enclosure of shafts	Any proposed services and stair shafts are to be designed to comply with this provision. The bottom of fire rated shaft are required to be enclosed by fire rated construction. The top of fire rated shaft is to be enclosed by fire rated construction, except for service shafts that pass beyond the roof covering.	N/A
5.1	Fire resistance of building elements	The proposed building is required to be designed to comply with the required fire resistance levels applicable to Type A construction. The following fire resistance requirements generally apply: Laboratory – 4 hrs Loading dock – 4 hrs Cafe - 3 hrs Class rooms – 2 hrs Office – 2 hrs It is proposed to performance justify the fire resistances levels such that the 2 hr fire resistance applies in lieu of the 4 hrs. External walls, and the floor and floor framing of lift pits are to be non-combustible. Loadbearing internal walls are to be concrete or masonry. Non-loadbearing fire rated walls are to be non-combustible. If the Sam Cracknel Pavilion contains external loadbearing walls less than 18 m for the proposed building, and such external walls (excluding glazed openings) do not have an FRL of at least 120/120/120, this non-compliance is required to be performance justified.	Alternative solution Further detail required
5.2	Carparks	A carpark is not proposed.	N/A

3.2.3 Compartmentation and Separation (Part C2)

BCA Clause	Title	Assessment and Comment	Status
C2.2	General floor area & volume limitations	The building exceeds the compartment limits outlined in this clause. Fire compartmentation will be provided to comply with this clause except that the fire resistance of the fire walls will be performance justified.	Alternative solution
C2.6	Vertical separation of openings in external walls	The building is proposed to be sprinkler protected therefore vertical separation is not required.	Complies
C2.7	Separation by firewalls	Fire walls are proposed to divide the building into separate fire compartments, however the fire resistance of the fire walls will be performance justified.	Alternative solution
C2.8	Separation of classifications in the same storey	Fire resistance levels are to be performance justified.	Alternative solution
C2.9	Separation of classifications in different storeys	The reinforced concrete floors 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. The FRLs are to be performance justified.	Alternative solution

BCA Clause	Title	Assessment and Comment	Status
C2.10	Separation of lift shafts	The goods lift is required to be fire separated as required by this clause. The passenger lifts are required to be fire separated at Basement and Ground Floor as required by this clause.	The proposed building is capable of complying
C2.11	Stairways and lifts in one shaft	The goods lift at ground floor is within the eastern fire isolated stair shaft. It is proposed to redesign this area to comply.	Minor design change required
C2.12	Separation of equipment	The following equipment is to be fire separated from the remainder of the building by 120/120/120 FRL construction: b) Boilers c) Lift motors and control panels d) Emergency generators used to sustain emergency equipment operating in emergency mode; or e) Central smoke control plant; or f) Boilers; or g) Batteries installed in a building that have a voltage exceeding 24 volts and capacity exceeding 10ampere hours.	The proposed building is capable of complying
C2.13	Electricity supply system	The main switchboard board, sustaining emergency equipment, is to be fire separated from the remainder of the building by 120/120/120 construction. Electrical conductors located within a building that supply- (i) a substation located within a building which supplies a main switchboard covered by C2.13(b); or (ii) a main switchboard covered by C2.13(b), must have classifications required by this clause and enclosed or otherwise protected by 120/120/120 FRL construction. The electrical conductors located within the building and supply the main switchboard are required be designed to comply with this clause. The switchboards in the electrical distribution system, which sustain the electricity supply to the emergency equipment, must provide full segregation by way of enclosed metal partitions designed to prevent the spread of any fault from non-emergency equipment switchgear to the emergency equipment switchgear.	The proposed building is capable of complying

3.2.4 Protection of openings (Part C3)

BCA Clause	Title	Assessment and Comment	Status
C3.2	Protection of openings in external walls	No protection of opening in external walls is required under this clause.	Complies
C3.3	Separation of external walls and associated openings in different fire compartments	This is to be assessed on determination of location of fire walls.	The proposed building is capable of complying
C3.4	Acceptable method of protection	N/A	N/A
C3.5	Doorways in fire walls	Fire doors in fire walls are to be provided in accordance with this clause.	The proposed building is capable of complying
C3.6	Sliding fire doors	Sliding fire doors are not proposed within the building.	N/A

BCA Clause	Title	Assessment and Comment	Status
C3.8	Openings in fire-isolated exits	Proposed doorways in fire isolated exits are required to be protected by -/60/30 fire doors.	The proposed building is capable of complying
C3.9	Service penetrations in fire- isolated exits	Only proposed services permitted by this clause are to penetrate through fire isolated exits.	The proposed building is capable of complying
C3.10	Fire-isolated lift shafts	The entrance doorway to passenger lift shaft, required to be fire rated, must be protected by –/60/– fire doors that— (i) comply with AS 1735.11; and (ii) are set to remain closed except when discharging or receiving passengers, goods or vehicles. The lift call panel, indicator panel or other panel in the wall of a fire-isolated lift shaft must be backed by construction having an FRL of not less than –/60/60 if it exceeds 35,000 mm^2 in area.	The proposed building is capable of complying
C3.12	Openings in floors and ceilings for services	Services passing though floors are to be fire stopped or located within complying fire rated shafts, in accordance with this clause.	The proposed building is capable of complying
C3.13	Openings in shafts	Access panels, doors and hoppers to required fire rated shafts are to have a fire rating as required by this clause.	The proposed building is capable of complying
C3.15	Openings for service installations	Services that penetrate a building element required to be fire rated must be protected utilising one of the options listed under this clause.	The proposed building is capable of complying
C3.16	Construction joints	Construction joints in building elements required to be fire resisting are required to be protected in accordance with this clause.	The proposed building is capable of complying
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.	The proposed building is capable of complying

3.3 Access & Egress (BCA Section D)

3.3.1 Provision for escape (Part D1)

BCA Clause	Title	Assessment and Comment	Status
D1.1	Application of part	The provisions of Part D1 apply subject to concessions within residential sole-occupancy units.	Note
NSW D1.2	Number of exits required	At least two exits are required to serve basement to Level 4.	The proposed building complies
D1.3	When fire isolated exits are required	Exit stairs connecting more than 3 levels are required to be fire isolated. The western and eastern tower exit stairs which are not enclosed on ground floor are proposed to be redesigned to comply with this clause. The stairs connecting Basement level with ground level may be non-fire isolated. Level 5 is required to be served by two fire isolated exits in order to comply with the DTS provisions (D1.4) of the BCA. The second alternative exit from level 5 is proposed to be a stairway discharging onto Level 4. This is to be performance justified.	Minor design change required Alternative solution

BCA Clause	Title	Assessment and Comment	Status
D1.4	Exit travel distances	The BCA requires that no point on a floor can be more than 20m from an exit, or from a point which travel in different directions to 2 exits is available. Where two exits are available the maximum distance to one of those exits must not exceed 40m. The following areas are more than 20 m to a point of choice: 1. The north eastern corner building on Level 1 to 3 is more than 20 m to a point of choice. 2. One of the Lower ground floor south east store room. 3. Level 4 north west store room. The building also contains areas that are more than 40 m to the nearest exit. These are to be performance justified.	Alternative solution Alternative solution
D1.5	Distance between alternative exits	The distance between alternative exits is more than 60 m from the Level 1 – 3 north western and south western offices and the south east lab.	The proposed building complies
NSW D1.6	Dimensions of exits and paths of travel to exits	The dimensions of exits are to be designed to comply with this clause	The proposed building is capable of complying
D1.7	Travel via Fire-isolated exits	The discharge of the eastern and western fire isolated stair within the ground floor does not comply. It is proposed to redesign the stair to comply with this clause. Protection of openings near the discharge of the fire stairs may be required depending on the location of the external path of travel.	Design change required The proposed building is capable of complying
D1.8	External Stairs or ramps in lieu of Fire-isolated exits	External stairs are not provided in lieu of fire isolated exits.	N/A
D1.9	Travel via non-fire-isolated stairways or ramps	The open stairs serving the basement and discharging onto the ground floor are capable of complying.	The proposed building is capable of complying
NSW D1.10	Discharge from exits	Exits are not capable of being blocked by vehicles, therefore bollards are not required. The discharge point of the exits are required to be connected to the road by a minimum 1 m wide path and where there is a change of level, the path must contain a complying stair or ramp. The discharge point of alternative exits is located as far apart as practical.	The proposed building complies The proposal is capable of complying The proposed building complies
D1.11	Horizontal exits	Horizontal exits are not proposed.	N/A
D1.12	Non-required stairways, ramps or escalators	The building contains a non-required stair in the atrium connecting Level 1 to 3. A non-required stair in an atrium may connect any number of storeys.	Complies
D1.13	Number of persons accommodated	Populations have been assessed in accordance with D1.13.	Note
D1.16	Plant rooms and lift motor rooms: concessions	N/A	N/A
D1.17	Access to lift pits	Access to lift pits is required to be designed in accordance with this clause.	The proposed building is capable of complying

3.3.2 Construction of exits

BCA Clause	Title	Assessment and Comment	Status
D2.1	Application of part	The provisions of Part D2 apply subject to concessions within residential sole-occupancy units and entertainment venues (POPES).	Note
D2.2	Fire-isolated stairways and ramps	The required fire isolated stairs are to be of non-combustible construction and be designed so that local failure will not result in structural damage to, or impair the fire resistance of the shaft.	The proposed building is capable of complying
D2.3	Non-fire isolated stairs and ramps	Non-fire isolated stairs must be constructed according to D2.2, or only of— (a) reinforced or prestressed concrete; or (b) steel in no part less than 6 mm thick; or (c) timber that— (i) has a finished thickness of not less than 44 mm; and (ii) has an average density of not less than 800 kg/m^3 at a moisture content of 12%; and (iii) has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.	The proposed building is capable of complying
D2.4	Separation of rising and descending stair flights	The rising and descending flights of the eastern exit on ground floor are separated. The redesign of the western exit stair on the ground floor is to be designed to comply with this clause.	The proposed building is capable of complying
D2.7	Installation in exits and paths of travel	Access to service shafts is not permitted from within the fire isolated stair or passageway. Gas or other fuel services are not permitted to be installed in a required exit. Electrical & comms cupboards are to be smoke sealed. This generally requires lining internally with non-combustible material and smoke sealed, including smoke seals to doors. The fire isolated stairways are not to be penetrated by any service not permitted by this clause.	The proposed building is capable of complying
D2.8	Enclosure of space under stairs	No enclosures are permitted under the proposed fire isolated stairs. Any enclosures under non-fire isolated stairs are to be enclosed by 60/60/60 FRL construction.	The proposed building is capable of complying
D2.9	Width of stairways	The required width of stairs is to be measured clear of obstructions.	Note
D2.10	Pedestrian ramps	The proposed pedestrian ramps are to be not steeper than 1:8 or 1:14 if required for people with disabilities. The floor surface of a ramp must have a non-slip finish.	The proposed building is capable of complying
D2.11	Fire isolated passageways	Fire isolated passageways are not proposed.	N/A
D2.12	Roof as Open Space	N/A	N/A
NSW D2.13	Goings & risers	Goings and risers to the stairways are required to be designed to comply with this clause.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
D2.14	Landings	Stair landings are to be designed in accordance with this clause.	The proposed building is capable of complying
NSW D2.15	Thresholds	Thresholds are to be designed to comply.	The proposed building is capable of complying
NSW D2.16	Balustrades and other barriers	Balustrades are to be designed to comply with this clause.	The proposed building is capable of complying
D2.17	Handrails	Handrails are to be provided to stairs and ramps and designed to comply with this clause.	The proposed building is capable of complying
D2.18	Fixed platforms, walkways, stairways & ladders	Within plant rooms, any fixed platforms, walkways, stairways, ladders and any going and riser, landing, handrail, balustrade or other barrier attached thereto may comply with AS 1657.	The proposed building is capable of complying
NSW D2.19	Doorways and doors	Exit doors consist of swinging doors, swinging in the direction of egress.	The proposal is capable of complying
D2.20	Swinging doors	Exit doors consist of swinging doors, swinging the direction of egress.	The proposed building complies
NSW D2.21	Operation of latch	Door hardware is required to comply with this clause.	The proposed building is capable of complying
D2.22	Re-entry from fire isolated exits	N/A	N/A
D2.23	Signs on doors	Signage is required to be provided to fire isolated exit doors in accordance with this clause.	The proposed building is capable of complying
D2.101	Doors in paths of travel in an entertainment venue	N/A	N/A

3.3.3 Access for people with disabilities

BCA Clause	Title	Assessment and Comment	Status
D3.1	Application of Part	The deemed to satisfy provisions of this part apply to a class 9b building	Note
D3.2	General building access requirements	Access for people with disabilities is required within the building in accordance with AS1428.1. AS1428.1 complying access must be provided: (i) from the allotment boundary at the main points of entry; and (ii) from any accessible carapace on the allotment; and (iii) from any adjacent and associated accessible building on the allotment; and (iv) through the principle public entrance.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
D3.3	Parts of building to be accessible	Access is required to be provided to areas normally used by occupants and to the accessible sanitary facility. Finishes and fittings are required to comply with AS1428.1.	The proposed building is capable of complying
D3.5	Car parking	Not proposed	N/A
D3.6	Identification of accessible facilities, services, and features.	In every building required to be accessible , clear and legible Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access, in accordance with AS 1428.1 must identify— (a) each— (i) sanitary facility; and (ii) accessible space with a hearing augmentation system; and (b) where an entrance is not accessible, identify each accessible entrance.	The proposed building is capable of complying
D3.7	Hearing augmentation	Where an inbuilt amplification system, other than one used for emergency warning purposes only, is installed in the basement teaching theatres, a hearing augmentation system complying with AS 1428.1 is required.	The proposed building is capable of complying
D3.8	Tactile indicators	Tactile ground surface indicators are required to be provided to all public stairs and ramps. In the absence of a suitable barrier, tactile indicators are also required to identify an overhead obstruction less than 2 m above floor level, other than a doorway. Tactile ground surface indicators must be Type B indicators in accordance with AS1428.4.	The proposed building is capable of complying

3.4 Services & Equipment (BCA Section E)

3.4.1 Fire fighting equipment (Part E1)

BCA Clause	Title	Assessment and Comment	Status
E1.3	Fire hydrants	The proposed building is required to be served by a hydrant system complying with this clause. The hydrants in the proposed building are capable of complying. The location of internal hydrants, not being hydrants in fire isolated stairs or within 4 m of non-fire isolated exits, require support of the NSW Fire Brigade. The location of any proposed hydrants pumps are to be identified. The external hydrant booster will be designed and positioned to comply with AS 2419.1 except that it will not be adjacent to the principal vehicular access to the site. The location of the hydrant booster is to be performance justified.	The proposed building is capable of complying Alternative solution
E1.4	Fire hose reels	The proposed building is required to be served by a hose reel system complying with this clause.	The proposed building is capable of complying
E1.5	Sprinklers	Sprinklers are required by Part G3 and are proposed to be provided.	Refer to Part G3
E1.6	Portable fire extinguishers	Portable fire extinguishers are required to be provided in accordance with this clause.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
E1.8	Fire control centres	The building has a total floor area of less than 18,000 m^2.	N/A
E1.9	Fire precautions during construction	Not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each storey adjacent to each required exit or temporary stairway or exit.	Note
E1.10	Provision for special hazards	Suitable additional provision must be made if special problems of fighting fire could arise because of the nature or quantity of materials stored, displayed or used in a building or on the allotment. Details of the proposed process within the Labs is required in this regard.	The proposed building is capable of complying – additional detail required

3.4.2 Smoke hazard management (Part E2)

BCA Clause	Title	Assessment and Comment	Status
NSW E2.2	General Requirements	The following smoke hazard management measures are required: • Pressurisation of fire isolated stairs; • A sprinkler system and smoke detection system is required under Part G3.	The proposed building is capable of complying
		The fire compartment containing Class 9b portions must be provided with automatic shutdown of any air-handling system (other than non-ducted individual room units with a capacity not more than 1000l/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) which does not form part of the smoke hazard management system, on activation of- (i) smoke detectors installed complying with Clause 5 of Specification E2.2a; and (ii) any other installed fire detection and alarm system, including a sprinkler system complying with Specification E1.5.	The proposed building is capable of complying
		If the showcase function area is within a fire compartment more than 2000 m², the fire compartment is required to be provided with smoke exhaust. This is to be performance justified.	Alternative solution
E2.3	Provision for special hazards	Additional smoke hazard management measures may be necessary due to the— (a) special characteristics of the building; or (b) special function or use of the building; or (c) special type or quantity of materials stored, displayed or used in a building; or (d) special mix of classifications within a building or *fire compartment*, which are not addressed in Tables E2.2a and E2.2b. Details of the proposed process within the Labs is required in this regard.	The proposed building is capable of complying – additional detail required

3.4.3 Lift installations (Part E3)

BCA Clause	Title	Assessment and Comment	Status
E3.2	Stretcher facility in lifts	At least one lift is to be of a size that can accommodate a stretcher. One of the lifts is proposed to be redesigned to comply.	Minor design change

BCA Clause	Title	Assessment and Comment	Status
E3.3	Warning against use of lifts in fire	Warning signage for the passenger lifts is to be provided in accordance with this clause.	The building is capable of complying
E3.4	Emergency Lifts	Emergency lifts are not required.	N/A
E3.5	Landings	Access and egress from the lift well landing complies with this provision.	Complies
E3.6	Facilities for people with disabilities	The proposed lifts are required to be designed to comply with this provision.	The proposed building is capable of complying
E3.7	Fire service controls	All proposed lifts are to be provided with fire services controls in accordance with this provision.	The proposed building is capable of complying
E3.8	Aged Care buildings	N/A	N/A

3.4.4 Emergency lighting, exit signs and warning systems (Part E4)

BCA Clause	Title	Assessment and Comment	Status
E4.2	Emergency lighting requirements	Emergency lighting is required to be provided in accordance with this clause.	The proposed building is capable of complying
E4.5	Exit signs	Exit signs are required to be provided in accordance with this clause.	The proposed building is capable of complying
NSW E4.6	Directional exit signs	Exit signs are required to be provided in accordance with his clause.	The proposed building is capable of complying
E4.8	Design and operation of exit signs	The exit signs are required to be designed to comply with AS/NZS 2293.1.	The proposed building is capable of complying
E4.9	Sound systems and intercom systems for emergency purposes	A sound systems and intercom systems for emergency purposes is required to be provided in accordance with this clause.	The proposed building is capable of complying

3.5 Health & Amenity (BCA Section F)

3.5.1 Damp and weather proofing (Part F1)

BCA Clause	Title	Assessment and Comment	Status
F1.0	Deem to satisfy provisions	Performance requirement FP1.4, for the prevention of the penetration of water through external walls, is required to be complied with.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
F1.1	Stormwater drainage	Stormwater is required to be designed to comply with AS/NZS 3500.3	The proposed building is capable of complying
F1.5	Roof coverings	Metal roof sheeting is to comply with AS1562.1.	The proposed building is capable of complying
F1.6	Sarking	Sarking-type materials used for weatherproofing of roofs and walls are required to comply with AS/NZS 4200 Parts 1 and 2.	The proposed building is capable of complying
F1.7	Waterproofing of wet areas in buildings	Waterproofing of wet areas are required to comply with this clause.	The proposed building is capable of complying
F1.9	Damp-proofing	Damp proof course is required to be provided to walls to comply with this clause.	The proposed building is capable of complying
F1.10	Damp-proofing of floor on ground	A vapour barrier is required to be provided to the underside of a slab laid on ground, in accordance with this clause.	The proposed building is capable of complying
F1.11	Provision of floor wastes	Not applicable.	N/A

3.5.2 Sanitary and other facilities (Part F2)

BCA Clause	Title	Assessment and Comment	Status
F2.1	Facilities in residential buildings	Not applicable.	N/A
F2.3	Facilities in Class 3 to 9 buildings	Sanitary facilities are required based on use and occupant numbers. Separate facilities are required for students and staff. The number of facilities is to be designed developed.	The proposed building is capable of complying
F2.4	Facilities for people with disabilities	Facilities for people with disabilities is required in accordance with this clause.	The proposed building is capable of complying
F2.5	Construction of sanitary compartments	Sanitary compartments must have doors and partitions that separate adjacent compartments and extend- a) from floor level to the ceiling in case of a unisex facility; or b) to a height of not less than 1.5m above a floor if primary school children are the principal users; and c) 1.8m above the floor in all other cases. Doorways located less than 1.2m from the closet pan are required to swing outwards, slide or be capable of being removed from the outside (lift off hinges).	The proposed building is capable of complying

3.5.3 Room sizes (Part F3)

BCA Clause	Title	Assessment and Comment	Status
F3.1	Height of rooms and other spaces	The following minimum floor to ceiling heights apply: • Generally – 2.4 m • Corridors & bathrooms – 2.1 m	The proposed building is capable of complying

3.5.4 Light & Ventilation (Part F4)

BCA Clause	Title	Assessment and Comment	Status
F4.1	Provision of natural light	Not applicable.	N/A
F4.2	Method & extent of natural lighting	Not applicable.	N/A
F4.4	Artificial lighting	Artificial lighting is to be provided in accordance with this clause.	The proposed building is capable of complying
F4.5	Ventilation of rooms	Ventilation is to be provided by natural or mechanical means in accordance with this provision and Clause F4.6.	The proposed building is capable of complying
F4.8	Restriction on the position of water closets and urinals	Airlocks are proposed to the male and female toilets.	The proposed building will comply
F4.9	Airlocks	Refer above	The proposed building will comply
F4.11	Car park exhaust	No carpark is proposed	N/A
F4.12	Kitchen local exhaust	A commercial kitchen must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 and AS 1668.2 where— (a) any cooking apparatus has— (i) a total maximum electrical power input exceeding 8 kW; or (ii) a total gas power input exceeding 29 MJ/h; or (b) the total maximum power input to more than one apparatus exceeds— (i) 0.5 kW electrical power; or (ii) 1.8 MJ gas, per m^2 of *floor area* of the room or enclosure.	The proposed building is capable of complying

3.5.5 Sound Transmission & Insulation (Part F5)

BCA Clause	Title	Assessment and Comment	Status
F5.1	Application of Part	The provisions of this part do not apply.	Note

3.6 Ancillary Provisions (Section G)

3.6.1 Minor Structure and Components (Part G1)

BCA Clause	Title	Assessment and Comment	Status
G1.2	Refrigerated chambers, strongrooms & vaults	Any cool room associated with the kitchen is required to comply with this clause	The proposed building is capable of complying
G1.101	Provision for the cleaning of windows	The provision of cleaning of windows is to be provided in accordance with this clause.	The proposed building is capable of complying

3.6.2 Atrium construction

BCA Clause	Title	Assessment and Comment	Status
G3.2	Dimensions of atrium well	An atrium well must have a width throughout the well that is able to contain a cylinder having a horizontal diameter of not less than 6 m. The proposed atrium well is to be performance justified.	Alternative solution
G3.3	Separation of atriums by bounding walls	An atrium must be separated from the remainder of the building at each storey by bounding walls in accordance with this clause. The proposed is to be performance justified.	Alternative solution
G3.4	Construction of bounding walls	The proposed is to be performance justified.	Alternative solution
G3.5	Constriction at balconies	This clause requires balustrades bounding the atrium to be imperforate, non-combustible and at least 1 m high.	The proposed building is capable of complying
G3.6	Separation at roof	In an atrium— (a) the roof must have the FRL prescribed in Table 3 of Specification C1.1; or (b) the roof structure and membrane must be protected by a sprinkler system complying with Specification E1.5.	The proposed building is capable of complying
G3.7	Means of egress	All areas within the atrium have access to at least two exits.	Complies
G3.8	Fire & smoke control systems	Fire and smoke control systems are required to comply with Specification G3.8. refer below.	Refer below

BCA Clause	Title	Assessment and Comment	Status
Spec G3.8 Clause 2	Automatic fire sprinkler system	A sprinkler system in accordance with BCA Spec e1.5 is required. A roof of an atrium which does not have the FRL prescribed in Specification C1.1 or the Deemed-to-Satisfy Provisions of Part C2 must be protected by automatic sprinklers arranged to wet both the covering membrane and supporting structure and the temperature rating of sprinkler heads providing roof protection must be within the range 79°C–100°C. The floor of the atrium must be protected by sprinklers with— (a) the use of sidewall pattern sprinkler heads together with overhead sprinklers where dictated by the dimensions of the atrium; and (b) sprinkler heads of the fast response type, installed with suitable non-combustible heat collector plates of 200 mm minimum diameter to ensure activation by a rising fire plume. Basic sprinkler and wall wetting systems protecting a building containing an atrium must be provided with easily accessible and identified stop valves.Sprinkler and wall wetting systems must be provided with independent stop valves.Sprinkler heads protecting the roof of the atrium must be provided with a stop valve. Stop valve to wall wetting and roof sprinklers may be of the gate type. All sprinkler and wall wetting stop valves must be monitored to detect unauthorised closure.	The building is capable of complying The building is capable of complying The building is capable of complying The building is capable of complying
Spec G3.8 Clause 3	Smoke control system	This clause contain requirements for smoke control in atrium buildings including: 3.2 Operation of atrium mechanical air-handling systems 3.3 Activation of smoke control system 3.4 Smoke exhaust system 3.5 Upward air velocity 3.6 Exhaust fans 3.7 Smoke and heat vents 3.8 Make-up air supply The system of smoke control will not comply with all of these requirements and will be performance justified.	Alternative solution
Spec G3.8 Clause 4	Fire detection and alarm system	BCA Specification G3.8 requires that a building containing an atrium must be provided with automatic fire detection and alarm system in accordance with AS1670.1 and Clause 4 of spec G3.8.	The building is capable of complying
Spec G3.8 Clause 5	Sound systems and intercom systems for emergency purposes	All buildings containing an atrium must be provided with a sound system and intercom system for emergency purposes which— (a) complies with AS 1670.4; and (b) incorporates visual warning devices that— (i) operate upon the evacuation signal; and (ii) display the words “EVACUATE” in red with letters conforming with the requirements of the Deemed-to-Satisfy Provisions of Part E4 for exit signs.	The building is capable of complying
Spec G3.8 Clause 6	Standby power systems	If a required path of travel to an exit is within an atrium, a suitable alternative power supply must be provided to operate required safety systems, including sprinkler systems and fire hydrant pumps, air handling systems, alarms, warning and communication systems and emergency lighting circuits, in accordance with this clause	The building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
Spec G3.8 Clause 7	System for excluding smoke from fire isolated exits	Pressurisation of fire isolated exits is required in accordance with this clause.	The building is capable of complying

3.7 Energy Efficiency – NSW Variation (Section J – 3 and 5 to 9 buildings)

Class 3, 5 to 9 buildings must comply with the relevant national provisions of Section J, except as varied by NSW J1.6 for Class 3 Buildings, NSW J3.4 and J8.2 for Class 3 and 5 to 9 buildings.

The assessment is based on buildings located within Climate Zone 5.

3.7.1 Building Fabric (Part J1)

BCA Clause	Title	Assessment and Comment	Status
J1.1	Application of part	The Deemed-to-Satisfy Provisions of this Part apply to a building elements forming the envelope of a class 3 – 9 building other than- (a) a class 7, 8 & 9b building that does not have a conditioned space; or (b) an atrium or solarium that is not a conditioned space and is separated from the remainder of the building by an *envelope.*	Note
J1.2	Thermal Construction General	Required insulation, reflective insulation and bulk insulation is to be installed in accordance with this clause.	The proposed building is capable of complying
J1.3	Roof and Ceiling Construction	A roof or ceiling that is part of the envelope must achieve the Total R-Value specified in Table J1.3 for the direction of heat flow A roof that— (i) is required to achieve a minimum Total R-Value; and (ii) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and (iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see Specification J1.3 Figure 2(c) and (f)), must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed between the metal sheet roofing and its supporting member.	The proposed building is capable of complying
J1.4	Roof Lights	Roof lights are required to be designed in accordance with this clause. Details are to be provided with the construction documentation submitted with the construction certificate.	The proposed building is capable of complying
J1.5	Walls	Each part of an external wall that is part of the envelope must satisfy one of the options in Table J1.5b A wall that— (i) is required to achieve a minimum Total R-Value; and (ii) has lightweight external cladding such as weatherboards, fibre cement or metal sheeting fixed to a metal frame; and (iii) does not have a wall lining or has a wall lining that is fixed directly to the metal frame, must have a thermal break, consisting of a material with an R-Value of not less than R0.2, installed between the external cladding and the metal frame.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
NSW J1.6	Floors	The requirements of this provision only apply to suspended floors or floors with in-slab heating and do not apply to the subject building.	N/A

3.7.2 External Glazing (Part J2)

BCA Clause	Title	Assessment and Comment	Status
J2.1	Application of part	The Deemed-to-Satisfy Provisions of this Part apply to a building elements forming the *envelope* of a class 3 – 9 building other than- (a) a class 7, 8 & 9b building that does not have a conditioned space; or (b) an atrium or solarium that is not a conditioned space and is separated from the remainder of the building by an *envelope.*	Note
J2.2	Application of glazing provisions	Glazing must be design in accordance with J2.4.	The proposed building is capable of complying
J2.3	Glazing – Method 1	N/A	N/A
J2.4	Glazing – Method 2	A detailed glazing calculator demonstrating compliance must be submitted by a suitably qualified person.	The proposed building is capable of complying
J2.5	Shading	Required shading is required to be designed in accordance with the requirements of this condition.	Note

3.7.3 Building Sealing (Part J3)

BCA Clause	Title	Assessment and Comment	Status
J3.1	Application of part	The Deemed-to-Satisfy Provisions of this Part apply to the Class 3, and 5 to 9 components of the development except a: (a) a building in climate zones 1, 2, 3 & 5 where the only means of air-conditioning is by using an evaporative cooler; or (b) permanent building ventilation opening, in a space where a gas appliance is located, that is necessary for the safe operation of the gas appliance; and (c) Class 6, 7, 8 and 9b building that does not have a conditioned space; or (d) a building or space where the mechanical ventilation system required by Part F4 provides sufficient pressurization to prevent infiltration; or (e) an atrium or solarium that is not a conditioning space and is separated from the remainder of the building by an envelope. (f) parts of the building that cannot be fully enclosed.	Note
J3.2	Chimneys and flues	Solid fuel burning appliances are not proposed and the requirements of this provision do not apply.	N/A
J3.3	Roof Light	Roof lights are required to be sealed or capable of being sealed.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
J3.4	External Windows and doors	External windows and doors are required to be sealed to restrict air infiltration. The requirements of this provision do not apply to, 1. Windows complying with AS2047, 2. Louvre windows, 3. Roller shutter doors. A main entrance to a building, if leading to a conditioned space must have an airlock, self-closing door, revolving door or the like, other than— (i) where the conditioned space has a floor area of not more than 50 m^2; or (ii) where a café, restaurant, open front shop or the like has— (A) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the conditioned space; and (B) at all other entrances to the café, restaurant, open front shop or the like, self-closing doors.	The proposed building is capable of complying
J3.5	Exhaust Fans	A miscellaneous exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a; (a) conditioned space; or (b) a habitable room in climate zone 4, 6, 7 & 8.	The proposed building is capable of complying
J3.6	Construction of roofs, walls and floors	Roofs, external walls, external floors and any openings are required to be designed and constructed to minimise air leakage in accordance with this clause .	The proposed building is capable of complying
J3.7	Evaporative Coolers	Evaporative coolers are not proposed.	N/A

3.7.4 Air Movement (Part J4)

BCA Clause	Title	Assessment and Comment	Status
J4.1	Application of part	The Deemed-to-Satisfy Provisions of this Part do not apply in NSW.	Note
J4.2	Air Movement	N/A	N/A
J4.3	Ventilation openings	N/A	N/A
J4.4	Ceiling fans and evaporative coolers	N/A	N/A

3.7.5 Air Conditioning and Ventilation Systems (Part J5)

BCA Clause	Title	Assessment and Comment	Status
J5.2	Air Conditioning and Ventilating system	Any proposed air-conditioning systems and mechanical ventilation systems are required to comply with the requirements of this provision.	The proposed building is capable of complying
J5.3	Time Switch	The mechanical ventilation system and air conditions system design would be required to be designed in accordance with the requirements of this provision.	The proposed building is capable of complying
J5.4	Heating and chilling systems	Any heating of chilling system for air-conditioning would be required to be designed in accordance with the requirements of this provision.	The proposed building is capable of complying

BCA Clause	Title	Assessment and Comment	Status
J5.5	Miscellaneous exhaust system	A miscellaneous exhaust system with an air flow rate of more than 1000 L/s, that is associated with equipment having a variable demand such as a stove in a commercial kitchen or a chemical bath in a factory is requerid to be design to comply with this clause.	The proposed building is capable of complying

3.7.6 Artificial Lighting and Power (Part J6)

BCA Clause	Title	Assessment and Comment	Status
J6.1	Application of part	The Deemed-to-Satisfy provisions of this part apply to the development.	Note
J6.2	Internal Artificial lighting	The requirements of this provision relate to the illumination load and power of artificial lighting. Artificial lighting is to be designed in accordance with this provision	The proposed building is capable of complying
J6.3	Interior artificial lighting and power control	Artificial lighting and power control are to be designed and provided in accordance with this provision.	The proposed building is capable of complying
J6.4	Interior decorative and display lighting	Interior decorative and display lighting, such as for foyer mural or art display, must be controlled in accordance with this clause.	The proposed building is capable of complying
J6.5	Artificial lighting around the perimeter of a building	Artificial lighting around the perimeter of a building must be designed to comply with this clause.	The proposed building is capable of complying
J6.6	Boiling water and chilled water storage units	Power supply to a boiling water or chilled water storage unit is required to be controlled by a time switch in accordance with Spec J6.	The proposed building is capable of complying

3.7.7 Hot Water Supply (Part J7)

BCA Clause	Title	Assessment and Comment	Status
J7.2	Hot Water Supply	A hot water supply system for food preparation and sanitary purposes, other than a solar hot water supply system in climate zones 1, 2 and 3, must be designed and installed in accordance with Section 8 of AS/NZS 3500.4	The proposed building is capable of complying

3.7.8 Hot Water Supply (Part J8)

BCA Clause	Title	Assessment and Comment	Status
J8.2	Access for maintenance	Access for maintenance must be provided to— (a) all services and their components, including— (i) time switches and motion detectors; and (ii) room temperature thermostats; and (iii) plant thermostats such as on boilers or refrigeration units; and (iv) outside air dampers; and (v) reflectors, lenses and diffusers of light fittings; and (vi) heat transfer equipment; and (b) adjustable or motorised shading devices.	The proposed building is capable of complying

4.0 SUMMARY OF ITEMS PROPOSED TO BE ADDRESSED BY PERFORMANCE JUSTIFICATION

The following items are proposed to be dealt by Alternative Solution, i.e. justification against the performance requirements of the BCA in accordance with BCA Clause A0.5 (b).

SUMMARY OF PROPOSED ALTERNATIVE SOLUTIONS

BCA CLAUSE	Performance Requirements	ISSUE	JUSTIFICATION
Spec. C1.1, Clause 3.1 & C2.2, C2.7, C2.8 & C2.9	CP1, CP2, & EP2.2	Reduced fire resistance levels	PR
D1.3	DP5	Open stair serving as an exit from Level 5	PR
D1.4	DP4 & EP2.2	Extended travel distances	PR
D1.5	DP4	Extended distance between alternative exits	PR
E1.3	EP1.3	Location of hydrant booster	PR
E2.2	EP2.2	Smoke exhaust from showcase function area	PR
G3.2, G3.3, G3.4 & G3.8	CP2 & EP2.2	Atrium construction and services	PR

JUSTIFICATION LEGEND

PR PERFORMANCE REQUIREMENTS

An Alternative Building Solution Report prepared under Part A0.8 of the BCA demonstrating compliance with the 'performance requirements'. These reports are assessed by an Accredited Certifier during the Construction Certificate determination process.

5.0 CONCLUSION

The design as proposed is 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 that are intended to be addressed by Alternative Solution. Whilst these performance based solutions are to be design developed, it is our view that the solutions will not significantly impact on the current design.

Chris Michaels
For and on behalf of City Plan Services Pty Ltd

APPENDIX 1

Assessed plans prepared by FJMT

Plan Title	Drawing No	Revision	Date
Lower Ground	PA.04	-	01.12.09
Ground Floor	PA.05	-	01.12.09
Level One	PA.06	-	01.12.09
Level Two	PA.07	-	01.12.09
Level Three	PA.08	-	01.12.09
Level Four	PA.09	-	01.12.09
Level Five/Roof Plant	PA.10	-	01.12.09
Level Six/Roof	PA.11	-	01.12.09